



2.6.3 Other relevant information

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0/12/24



Prof. Dr. Vinod Kumar R B
Principal
Al-Azhar Dental College
Thodupuzha - 685 605



2.6.3 The teaching learning and assessment processes of the Institution are aligned with the stated learning outcomes.

INDEX SHEET

SL.NO	DESCRIPTION	PAGE
1.	Certificate of the Head of Institution	02 -03
2.	Other relevant information	04 -334



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Prof. Dr. Vinod Kumar R B
Principal
Al-Azhar Dental College
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AL-AZHAR DENTAL COLLEGE

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Idukki Dist., Kerala- 685 605
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CERTIFICATE FROM THE HEAD OF THE INSTITUTION



Handwritten signature in green ink: Vinod Kumar R B

Prof. Dr. Vinod Kumar R B
Principal
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DR. VINOD KUMAR R B M.D.S.
PRINCIPAL

TO WHOMSOEVER IT MAY CONCERN

This is to certify that, the teaching learning, and assessment processes of the Institution are aligned with the stated learning outcomes

Handwritten signature and date: 11/12/24

Prof. Dr. Vinod Kumar R B
Principal
Al-Azhar Dental College
Thodupuzha - 685 605



2.6.3 Program specific learning outcomes

S.No	Learning Outcomes	Teaching strategies/ practices	Assessment methods
1	Integration of basic sciences, clinical dentistry and practical and laboratory skills	<ol style="list-style-type: none"> Lecture class Practical class Clinical postings 	<ol style="list-style-type: none"> Internal assessments University exam
2	A knowledge of normal human structure, development, function and disease process	<ol style="list-style-type: none"> Lecture class Dissection practical classes 	<ol style="list-style-type: none"> Internal assessments University exam
3	Sufficient practical skill including patient management and treatment of patients of all ages with special reference to pediatric, geriatric, medically compromised and disabled patient	<ol style="list-style-type: none"> Lecture class/ demo Clinical postings Health camp postings 	<ol style="list-style-type: none"> End posting exams University practical exam
4	Commitment towards society as a whole along with knowledge and treatment skills gained	<ol style="list-style-type: none"> Group discussions Clinical posting Treatment camps 	<ol style="list-style-type: none"> Random check by faculty Patient feed back
5	Motivated for interdisciplinary research activities and emphasis on evidence-based dentistry	<ol style="list-style-type: none"> Presentations in and outside classrooms Case discussions CDEs 	<ol style="list-style-type: none"> Evaluation forms Awards received
6	Learns significance of infection and cross infection control in dental practice	<ol style="list-style-type: none"> Clinical postings 	<ol style="list-style-type: none"> End posting Exams University practical exams

Prof. Dr. Vinod Kumar

Under the aegis of Noorul Islam Trust
(Recognised by Dental Council of India & Affiliated to KUHS)

Thodupuzha - 685 605

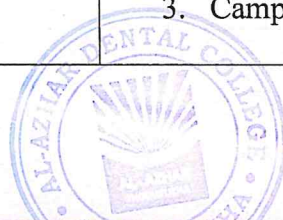
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AL-AZHAR DENTAL COLLEGE

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7	To learn the importance of various dental tissues in forensic sciences	<ol style="list-style-type: none">1. Pathology clinical postings2. Discussions	<ol style="list-style-type: none">1. Internal exams2. University exams
8	Administer all forms of Local anaesthesia, knowledge of various maxillofacial problems like injuries, infections and deformities of the jaw	<ol style="list-style-type: none">1. Oral surgery postings2. Medical college postings	<ol style="list-style-type: none">1. Internal exams2. University exams
9	Restoration of various kinds and endodontic procedures, removable and fixed prosthodontics	<ol style="list-style-type: none">1. Demo2. Practical postings3. Clinical postings	<ol style="list-style-type: none">1. Practical sessionals2. University practical exams
10	Appreciate the role of dentofacial growth and development of malocclusion	<ol style="list-style-type: none">1. Lecture class2. Clinical postings in pedo and ortho dpt	<ol style="list-style-type: none">1. Sessional exams2. University theory exam3. University practical exam
11	Train in various investigation procedures like radiological techniques, biopsy, smear etc and its interpretations	<ol style="list-style-type: none">1. Lecture class2. Demo3. Clinical postings	<ol style="list-style-type: none">1. Evaluation forms
12	Legal systems involved in practice of dentistry and patient rights	<ol style="list-style-type: none">1. Lecture class2. CDE	<ol style="list-style-type: none">1. Feedback forms
13	Should be aware of his/her limitations	<ol style="list-style-type: none">1. CDE2. Clinical posting3. Camp postings	<ol style="list-style-type: none">1. Feedback forms2. Evaluation forms



Prof. Dr. Vinod Kumar P.P.
Principal
Al-Azhar Dental College

DENTAL COUNCIL OF INDIA

BDS COURSE REGULATIONS 2007



DENTAL COUNCIL OF INDIA

Temple Lane, Kotla Road

New Delhi – 110 002

PREFACE

TO

BDS COURSE REGULATIONS 2007

(Modified: 25.07.2007)

Framed by the Dental Council of India and approved by the Central Government under the Dentists Act, 1948 – vide Government of India, Ministry of Health & Family Welfare (Deptt. of Health's) letter No.V.12012/3/2006-DE dated 25.07.2007.

CONTENTS

S.No.		Page
1.	Admission, Selection and Migration	
	I. Eligibility Criteria	
	II. Selection of Students	
	III. Duration of the course	
	IV. Migration	
	V. Attendance requirement, Progress and conduct	
	VI. Subject of Study	
	VII. Examination	
	VIII. Qualification and experience to be eligible for examinership	
2.	Goals and objectives	
	➤ Goals	
	➤ Objectives	
	➤ Recommendations : General	
	➤ Recommendations : Specific	
	➤ Competencies	
	➤ Minimum working hours for each subject of study	
	➤ Recommended Books	
3.	Infrastructural, Functional & Equipment Requirements	
	• General Facilities	
	• General Hospital	
	• Dental Hospital	
4.	Equipment Requirements	
	• Department : Oral Medicine and Radiology	
	• Department : Oral Pathology and Oral Microbiology	
	• Department : Public Health Dentistry	
	• Department : Paediatric and Preventive Dentistry	
	• Department : Orthodontics & Dentofacial Orthopaedics	
	• Department : Periodontology	
	• Department : Conservative Dentistry and Endodontics	
	• Department : Oral & Maxillofacial Surgery	
	• Department : Prosthodontics and Crown & Bridge	
5.	Minimum basic qualification & teaching experience required for teachers for undergraduate dental studies	
	• Dental Staff	
	• Medical Staff	
6.	Staffing Pattern – Teaching & Non-Teaching Staff	
	• Minimum Staffing for UG Dental Studies for 50 Admissions	
	• Minimum Staffing for UG Dental Studies for 100 Admissions	
	• Medical Teaching Staff in a Dental College	
	• Other Staff Pattern for 50 Admissions	
	• Other Staff Pattern for 100 Admissions	
7.	Syllabus of Study	
	1. Human Anatomy, Embryology, Histology & Medical Genetics	
	2. Human Physiology & Biochemistry, Nutrition & Diatics	
	3. Dental Anatomy, Embryology and Oral Histology	
	4. General Pathology & Microbiology	
	5. General and Dental Pharmacology and Therapeutics	
	6. Dental Materials	
	7. Pre Clinical Conservative Dentistry Laboratory Exercisesz	
	8. Oral Pathology & Oral Microbiology	
	9. General Medicine	
	10. General Surgery	
	11. Conservative Dentistry and Endodontics	
	12. Oral & Maxillofacial Surgery	
	13. Oral Medicine and Radiology	
	14. Orthodontics & Dentofacial Orthopaedics	
	15. Paediatric & Preventive Dentistry	
	16. Public Health Dentistry	
	17. Periodontology	
	18. Prosthodontics and Crown & Bridge	
	19. Aesthetic Dentistry	
	20. Forensic Odontology	
	21. Oral Implantology	
	22. Behavioural Science	
	23. Ethics	

**DENTAL COUNCIL OF INDIA
NOTIFICATION
New Delhi, the 25th July, 2007**

No.DE-22-2007.-In exercise of the powers conferred by Section 20 of the Dentists Act, 1948, the Dental Council of India with the previous sanction of the Central Government hereby makes the following Revised BDS Course Regulations :-

1. Short title and commencement. – (i) These Regulations may be called the Dental Council of India Revised BDS Course Regulations, 2007.
(ii) They shall come into force on the date of their publication in the Official Gazette.

REGULATIONS FOR THE DEGREE OF BACHELOR OF DENTAL SURGERY

GENERAL: Universities awarding the degrees in Bachelor of Dental Surgery (BDS) and Master of Dental Surgery (MDS) shall establish independent Dental Faculty.

The heading ‘ADMISSION, SELECTION, AND MIGRATION’ shall be read as under, in terms of (8th Amendment) notification published on 12.7.2017 in the Gazette of India.

~~ADMISSION, SELECTION AND MIGRATION:-~~

ADMISSION, SELECTION, COUNSELLING AND MIGRATION:-

I. Admission to the Dental Course – Eligibility Criteria:

No Candidate shall be allowed to be admitted to the Dental Curriculum of first Bachelor of Dental Surgery (BDS) Course until:

1. He/she shall complete the age of 17 years on or before 31st December, of the year of admission to the BDS course;

The following has been inserted, and the existing sub-regulation “2.” is re-numbered as “3”., in terms of (5th Amendment) notification published on 31st May, 2012 in the Gazette of India.

2. He/She has obtained a minimum of marks in National Eligibility-cum-Entrance Test as prescribed in sub-regulation 5 of Regulation II under the heading “**Selection of students:**”

The following has been inserted in terms of (5th Amendment) notification published on 1st June, 2012 in the Gazette of India

3. ~~2.~~ In order to be eligible to take National Eligibility-cum-Entrance Test he/she has passed qualifying examination as under:-
 - a. The higher secondary examination or the Indian School Certificate Examination which is equivalent to 10+2 Higher Secondary Examination after a period of 12 years study, the last two years of study comprising of Physics, Chemistry, Biology and Mathematics or any other elective subjects with English at a level not less than the core course for English as prescribed by the National Council for Educational Research and Training after the introduction of the 10+2+3 years educational structure as recommended by the National Committee on education;
Note: Where the course content is not as prescribed for 10+2 education structure of the National Committee, the candidates will have to undergo a period of one year pre-professional training before admission to the dental colleges;
or
 - b. The intermediate examination in science of an Indian University/Board or other recognised examining body with Physics, Chemistry and Biology which shall include a practical test in these subjects and also English as a compulsory subject;
or
 - c. The pre-professional/pre-medical examination with Physics, Chemistry and Biology, after passing either the higher secondary school examination, or the pre-university or an equivalent examination. The pre-professional/pre-medical examination shall include a practical test in Physics, Chemistry and Biology and also English as a compulsory subject;
or

- d. The first year of the three years degree course of a recognized university, with Physics, Chemistry and Biology including a practical test in three subjects provided the examination is a "University Examination" and candidate has passed 10+2 with English at a level not less than a core course;
- or
- e. B.Sc examination of an Indian University, provided that he/she has passed the B.Sc examination with not less than two of the following subjects Physics, Chemistry, Biology (Botany, Zoology) and further that he/she has passed the earlier qualifying examination with the following subjects-Physics, Chemistry, Biology and English.
- or
- f. Any other examination which, in scope and standard is found to be equivalent to the intermediate science examination of an Indian University/Board, taking Physics, Chemistry and Biology including practical test in each of these subjects and English.

The following have been added under the heading "Admission to the Dental Course- Eligibility Criteria" after sub-clause 2 (f), in terms of (2nd Amendment) notification published on 29th October, 2010 in the Gazette of India.

"3. 3% seats of the annual sanctioned intake capacity shall be filled up by candidates with locomotory disability of lower limbs between 50% to 70%

Provided that in case any seat in this 3% quota remains unfilled on account of unavailability of candidates with locomotory disability of lower limbs between 50% to 70% then any such unfilled seat in this 3% quota shall be filled up by persons with locomotory disability of lower limbs between 40% to 50% before they are included in the annual sanctioned seats for General Category candidates.

Provided further that this entire exercise shall be completed by each Dental College/Institution as per the statutory time schedule for admissions and in no case any admission will be made in the BDS course after 30th of September."

The following has been deleted in terms of (5th Amendment) notification published on 1st June, 2012 in the Gazette of India

Note:

- ~~Marks obtained in Mathematics are not to be considered for admission to BDS Course.~~
- After the 10+2 course is introduced, the integrated courses should be abolished.

II. Selection of Students: The selection of students to dental college shall be based solely on merit of the candidate and for determination of the merit, the following criteria be adopted uniformly throughout the country:

The following has been deleted in terms of (5th Amendment) notification published on 1st June, 2012 in the Gazette of India

- ~~1. In states, having only one Dental College and one university board/examining body conducting the qualifying examination, the marks obtained at such qualifying examination may be taken into consideration;~~
- ~~2. In states, having more than one university/board/examining body conducting the qualifying examination (or where there is more than one dental college under the administrative control of one authority) a competitive entrance examination should be held so as to achieve a uniform evaluation as there may be variation of standards at qualifying examinations conducted by different agencies;~~
- ~~3. Where there are more than one college in a state and only one university/board conducting the qualifying examination, then a joint selection board be constituted for all the colleges;~~
- ~~4. A competitive entrance examination is absolutely necessary in the cases of institutions of All India character;~~

The following has been deleted and substituted in terms of (5th Amendment) notification published on 1st June, 2012 in the Gazette of India

5. Procedure for selection to BDS course shall be as follows:-
- i. ~~in case of admission on the basis of qualifying examination under clause (1) based on merit, candidate for admission to BDS course must have passed in the subjects of Physics, Chemistry, Biology & English individually and must have obtained a minimum of 50% marks taken together in Physics, Chemistry, and Biology at the qualifying examination. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or Other Backward Classes, the marks obtained in Physics, Chemistry and Biology taken together in qualifying examination be 40% instead of 50% as above and must have qualifying marks in English.~~

~~The following have been added before the clause 5 (ii) under the heading “selection of students”, in terms of (2nd Amendment) notification published on 29th October, 2010 in the Gazette of India.~~

~~“Provided that the eligibility criteria for admission to persons with locomotory disability of lower limbs in terms of Clause 3 above will be a minimum of 45% marks instead of 50% taken together in qualifying examination and competitive entrance examination for admission in BDS Course.”~~

- ii. ~~In case of admission on the basis of competitive entrance examination under clause (2) to (4) of this regulation, a candidate must have passed in the subjects of Physics, Chemistry, Biology and English individually and must have obtained a minimum of 50% marks taken together in Physics, Chemistry and Biology at the qualifying examination and in addition must have come in the merit list prepared as a result of such competitive entrance examination by securing not less than 50% marks in Physics, Chemistry and Biology taken together in the competitive examination. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or any other categories notified by the Government the marks obtained in Physics, Chemistry and Biology taken together in qualifying examination and competitive entrance examination be 40% instead of 50% as stated above:~~

~~Provided that a candidate who has appeared in the qualifying examination the result of which has not been declared, he may be provisionally permitted to take up the competitive entrance examination and in case of selection for admission to the BDS course, he shall not be admitted to that course until he fulfils the eligibility criteria as per above regulations.~~

- i. ~~There shall be a single eligibility-cum-entrance examination namely “National Eligibility-cum-Entrance Test for admission to BDS course” in each academic year.”~~
- ii. ~~In order to be eligible for admission to BDS Course for a particular academic year, it shall be necessary for a candidate to obtain minimum of marks of 50th percentile in ‘National Eligibility-cum-Entrance Test to BDS course’ held for the said academic year. However, in respect of candidates belonging to Scheduled Castes, Scheduled Tribes, Other Backward Classes, the minimum marks shall be at 40th percentile. In respect of candidates with locomotory disability of lower limbs, the minimum marks shall be at 45th percentile. The percentile shall be determined on the basis of highest marks secured in the All-India common merit list in “National Eligibility-cum-Entrance Test for admission to BDS course.”~~

~~Provided when sufficient number of candidates in the respective categories fail to secure minimum marks as prescribed in National Eligibility-cum-Entrance Test held for any academic year for admission to BDS Course, the Central Government in consultation with Dental Council of India may at its discretion lower the minimum marks required for admission to BDS Course for candidates belonging to respective categories and marks so lowered by the Central Government shall be applicable for the said academic year only.~~

- iii. ~~The reservation of seats in dental colleges for respective categories shall be as per applicable laws prevailing in States/Union Territories. An all India merit list as well as State-wise merit list of the~~

eligible candidates shall be prepared on the basis of the marks obtained in National Eligibility-cum-Entrance Test and candidates shall be admitted to BDS course from the said lists only.

- iv. No Candidate who has failed to obtain the minimum eligibility marks as prescribed in Clause (ii.) above shall be admitted to BDS course in the said academic year.
- v. All admissions to BDS course within the respective categories shall be based solely on marks obtained in the National Eligibility-cum-Entrance Test.
- vi. To be eligible for admission to BDS Course, a candidate must have passed in the subjects of Physics, Chemistry, Biology/Biotechnology and English individually and must have obtained a minimum of 50% marks taken together in Physics, Chemistry and Biology/Biotechnology at the qualifying examination as mentioned in Sub-regulation 2 of Regulation I and in addition must have come in the merit list of "National Eligibility-cum-Entrance Test" for admission to BDS course. In respect of candidates belonging to Scheduled Castes, Scheduled Tribes or other Backward Classes the minimum marks obtained in Physics, Chemistry and Biology/Bio-technology taken together in qualifying examination shall be 40% instead of 50%. In respect of candidates with locomotory disability of lower limbs in terms of sub-regulation 4, after the commencement of these amendments, of Regulation 1 above, the minimum marks in qualifying examination in Physics, Chemistry and Biology/Bio-technology taken together in qualifying examination shall be 45% instead of 50%.
 Provided that a candidate who has appeared in the qualifying examination the result of which has not been declared, he/she may be provisionally permitted to take up the National Eligibility-cum-Entrance Test and in case of selection for admission to the BDS course, he/she shall not be admitted to that course until he fulfills the eligibility criteria under Regulation 1.
- vii. The Central Board of Secondary Education shall be the organization to conduct National Eligibility-cum-Entrance Test for admission to BDS course.

The following has been added under clause II 'Selection of Students', in terms of (8th Amendment) notification published on 27th July, 2017 in the Gazette of India:

II. A Common Counselling.

1. There shall be a common counselling for admission to BDS course in all dental educational institutions on the basis of merit list of the National Eligibility-cum-Entrance Test.
2. The designated authority for counselling for the 15% All India Quota seats of the contributing States and all BDS seats of Dental Education Institutions of the Central Government universities established by an Act of Parliament and the Deemed Universities shall be the Directorate General of Health Services, Ministry of Health and Family Welfare, Government of India.
3. The counselling for admission to BDS course in a State/Union Territory, including Dental Education Institutions established by the State Government, University established by an Act of State/Union Territory Legislature, Trust, Society, Minority Institutions shall be conducted by the State/Union Territory Government.
4. In case any dispute arises on such common counselling, the respective State Government shall refer the matter to the Central Government and its decision shall be final, in this regard.

III. Duration of the Course:

The following provision has been substituted to the extent indicated hereunder in terms of (3rd Amendment) notification published on **25th August, 2011** in the Gazette of India and the same is as under:-

~~The undergraduate dental training programme leading to BDS degree shall be of 5 years with 240 teaching days in each academic year. During this period, the student shall be required to have engaged in full-time study at a dental college recognized or approved by the Dental Council of India.~~

The undergraduate dental programme leading to BDS Degree shall be of 4 (four) Academic years with 240 teaching days in each academic year, plus one year paid rotating Internship in a dental college. Every candidate will be required, after passing the final BDS Examination to undergo one year paid rotating internship in a dental college. The detailed curriculum of Dental Internship Programme is annexed as Annexure-A. The internship shall be compulsory and BDS Degree shall be granted after completion of one year paid Internship.

~~NOTE: It is recommended by the DCI that the colleges who have implemented the revised BDS Course Regulation, 2007 itself, has to carry on with the existing five year programme. Regarding internship for this batch it is upto the respective university to decide.~~

Further, the admissions made from the year 2008-09, the students may be included in this amendment provided the concerned University's rules permit.

Provided that the Affiliating University/State Government are free to make applicable these amendment is upto the University to implement this amendment provided it abides by their Act/Rules and Regulations.

The above NOTE has been deleted and the following proviso is inserted below the NOTE in terms of (4th Amendment) notification published on 9.12.2011 in the Gazette of India and the same is as under:-

NOTE: Provided that the students of the batch admitted during the academic session 2007-2008, and consequently they are going to pursue their 5th year BDS Course as per the course curriculum and syllabus prescribed in the principal Revised BDS Course Regulations, 2007, may complete their Theory in 4 (four) subjects with 160 Lecture hours within a period of 6 (six) months as given below:-

Subject	Lecture Hours
Oral & Maxillofacial Surgery	30
Conservative Dentistry & Endodontics	50
Prosthodontics and Crown & Bridge	50
Public Health Dentistry	30
Total	160

On completion of such study, they shall have to appear in the University Examination and only after passing University Examination successfully, they shall be allowed to do six months Paid Rotating Internship Programme in all the Departments for the duration indicated against each Department as under:-

Departments	Period of Postings
1. Oral Medicine & Radiology	20 days
2. Oral && Maxillofacial Surgery	30 days
3. Prosthodontics	30 days
4. Periodontics	15 days
5. Concervative Dentist	10 days
6. Pedodontics	15 days
7. Oral Pathology & Microbiology	10 days
8. Orthodontics	10 days
9. Community Dentist/Rural Service	30 days
10. Elective	10 days
Total	180 days

The following proviso has been inserted in terms of (6th Amendment) notification published on 24.6.2013 in the Gazette of India:-

Provided further that students of 2007-2008 BDS batch who are declared passed with 4 ½ + 6 months Paid Rotatory Internship or 5-year duration course, as the case may be, as per Revised BDS Course (4th Amendment) Regulations, 2011, shall be deemed at par/equivalent with 4+1 year BDS Course, including one year Paid Rotatory Internship programme, for all interns and purposes i.e. for admission in MDS Course, applying for Govt Jobs, registration in State Dental Councils etc.

IV. Migration:

- (1) Migration from one dental college to other is not a right of a student. However, migration of students from one dental college to another dental college in India may be considered by the Dental Council of India. Only in exceptional cases on extreme compassionate ground*, provided following criteria are fulfilled. Routine migrations on other ground shall not be allowed.
- (2) Both the colleges, i.e. one at which the student is studying at present and one to which migration is sought, are recognised by the Dental Council of India.
- (3) The applicant candidate should have passed first professional BDS examination.
- (4) The applicant candidate submits his application for migration, complete in all respects, to all authorities concerned within a period of one month of passing (declaration of results) the first professional Bachelor of Dental Surgery (BDS) examination.
- (5) The applicant candidate must submit an affidavit stating that he/she will pursue 240 days of prescribed study before appearing at IInd professional Bachelor of Dental Surgery (BDS) examination at the transferee dental college, which should be duly certified by the Registrar of the concerned University in which he/she is seeking transfer. The transfer will be applicable only after receipt of the affidavit.

Note 1:

- (i) Migration is permitted only in the beginning of IInd year BDS Course in recognized Institution.
- (ii) All applications for migration shall be referred to Dental Council of India by college authorities. No Institution/University shall allow migrations directly without the prior approval of the Council.
- (iii) Council reserved the right, not to entertain any application which is not under the prescribed compassionate grounds and also to take independent decisions where applicant has been allowed to migrate without referring the same to the Council.

Note 2: *Compassionate ground criteria:

- (i) Death of supporting guardian.
- (ii) Disturbed conditions as declared by Government in the Dental College area.

V. Attendance requirement, Progress and Conduct

- (i) 75% in theory and 75% in practical/clinical in each year.
- (ii) In case of a subject in which there is no examination at the end of the academic year/semester, the percentage of attendance shall not be less than 70%. However, at the time of appearing for the professional examination in the subject, the aggregate percentage of attendance in the subject should satisfy condition (i) above.

VI. Subjects of Study:

First Year

- i) General Human Anatomy including Embryology and Histology
- ii) General Human Physiology and Biochemistry, Nutrition and Dietics
- iii) Dental Anatomy, Embryology and Oral Histology
- iv) Dental Materials
- v) Pre-clinical Prosthodontics and Crown & Bridge

Second Year

- i) General Pathology and Microbiology
- ii) General and Dental Pharmacology and Therapeutics
- iii) Dental Materials
- iv) Pre clinical Conservative Dentistry
- v) Pre clinical Prosthodontics and Crown & Bridge
- vi) Oral Pathology & Oral Microbiology

Third Year

- i) General Medicine

- ii) General Surgery
- iii) Oral Pathology and Oral Microbiology
- iv) Conservative Dentistry and Endodontics
- v) Oral & Maxillofacial Surgery
- vi) Oral Medicine and Radiology
- vii) Orthodontics & Dentofacial Orthopaedics
- viii) Paediatric & Preventive Dentistry
- ix) Periodontology
- x) Prosthodontics and Crown & Bridge

Fourth Year

- i) Orthodontics & dentofacial orthopaedics
- ii) Oral Medicine & Radiology
- iii) Paediatric & Preventive Dentistry
- iv) Periodontology
- v) Oral & Maxillofacial Surgery
- vi) Prosthodontics and Crown & Bridge
- vii) Conservative Dentistry and Endodontics
- viii) Public Health Dentistry

Fifth Year

- ~~i) Oral & Maxillofacial Surgery~~
- ~~ii) Prosthodontics and Crown & Bridge~~
- ~~iii) Conservative Dentistry and Endodontics~~
- ~~iv) Public Health Dentistry~~

The above 5th year subjects have been deleted in terms of (3rd Amendment) notification published on **25th August,2011** in the Gazette of India.

EXAMINATIONS

SCOPE: These regulations shall be applicable for the B.D.S. degree examinations conducted by various universities in the country.

I. PREFACE:

- (A) Evaluation is a continuous process, which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned B.D.S. programme.
- (B) Evaluation is achieved by two processes
 1. Formative or internal assessment
 2. Summative or university examinations.

Formative evaluation is done through a series of tests and examinations conducted periodically by the institution.

Summative evaluation is done by the university through examination conducted at the end of the specified course.

II. METHODS OF EVALUATION:

Evaluation may be achieved by the following tested methods:

1. Written test
2. Practicals
3. Clinical examination
4. Viva voce

INTERNAL ASSESSMENT EXAMINATION

The continuing assessment examinations may be held frequently at least **3** times in a particular year and the average marks of these examinations should be considered. 10% of the total marks in each subject for both theory, practical and clinical examination separately should be set aside for the internal assessment examinations.

SCHEME OF EXAMINATION:

The following has been substituted in terms of (3rd Amendment) notification published on **25th August,2011** in the Gazette of India and the same is as under:-

~~The scheme of examination for B.D.S. Course shall be divided into 1st B.D.S. examination at the end of the first academic year, 2nd B.D.S. examination at the end of second year, 3rd B.D.S. examination at the end of third, 4th BDS at the end of 4th and final B.D.S at the end of 5th year. 240 days minimum teaching in each academic year is mandatory.~~

The Scheme of Examination for BDS Course shall be divided into 1st BDS examination at the end of the first academic year, 2nd BDS examination at the end of second year, 3rd BDS examination at the end of third, 4th and final BDS at the end of 4th year. Where semester system exists, there shall be two examinations in the final year, designated as part 1 and part 2 of the respective examinations (regulations 1983) 240 days minimum teaching in each academic year is mandatory.

In terms of (6th Amendment) notification published on 24.6.2013 in the Gazette of India, in 1st line of 2nd paragraph under the heading (III) “Scheme of Examination”, the word “semester” has been substituted by the word “Part I or Part II, whichever is applicable”, as follows:-

For University opting for ~~semester~~ Part I or Part II, whichever is applicable mode, the subjects that are to be covered in each semester proposed below.

Part-I

- Public Health Dentistry
- Periodontology
- Orthodontics and Dentogacial Orthopaedic
- Oral Medicine and Radiology

Part-II

- Oral & Maxillofacial Surgery
- Conservative and Endodontics
- Prosthodontics and Crown & Bridge
- Paediatric and preventive Dentistry

The examination shall be open to a candidate who satisfies the requirements of attendance, progress and other rules laid down by the University.

(1) Universities shall organize admission timings and admission process in such a way that teaching starts from 1st day of August in each academic year.

I B.D.S. Examination:

1. General anatomy including embryology and histology
2. General human physiology and biochemistry
3. Dental Anatomy, Embryology and Oral Histology

~~Any student who does not clear the first BDS University Examination in all subjects within 3 years from the date of admission, shall be discharged from the Course.~~

The above clause has been substituted by the following clause in terms of (7th Amendment) notification published in the Gazette of India and the same is as under:-

Any student who does not clear the BDS Course in all the subjects within a period of 9 years, including one year Compulsory Rotatory paid Internship from the date of admission shall be discharged from the course.

~~Any candidate who fails in one subject in an Examination is permitted to go to the next higher class and appear for the subject and complete it successfully before he is permitted to appear for the next higher examination.~~

The above has been substituted in terms of (3rd Amendment) notification published on 25th August,2011 in the Gazette of India and the same is as under:-

Any candidate who fails in one subject in an Examination is permitted to go to the next higher class and appears for the said failed subject and complete it successfully before he is permitted to appear for the next higher examination. However, the Dental Council of India would have no objection, if the concerned University follows their examination scheme provided in their statute/regulations.

II B.D.S. Examination:

A candidate who has not successfully completed the 1st B.D.S. examination can not appear in the IInd year Examination.

1. General pathology and Microbiology
2. General and dental pharmacology and therapeutics
3. Dental Materials
4. Pre Clinical Conservative – Only Practical and Viva Voce
5. Pre Clinical Prosthodontics – Only Practical and Viva Voce

The following has been added after Sl. No. 5 of the subject, Pre-clinical Prosthodontics, in terms of (3rd Amendment) notification published on **25th August, 2011** in the Gazette of India and the same is as under:-

Any candidate who fails in one subject in an Examination is permitted to go to the next higher class and appears for the said failed subject and complete it successfully before he is permitted to appear for the next higher examination. However, the Dental Council of India would have no objection, if the concerned University follows their examination scheme provided in their statute/regulations.

III B.D.S. Examination:

A candidate who has successfully completed the 2nd B.D.S. examination can appear IIIrd B.D.S. Examination.

1. General Medicine
2. General Surgery
3. Oral Pathology and Oral Microbiology

The following has been added after Sl. No. 3 of the subject Oral Pathology and Oral Microbiology, in terms of (3rd Amendment) notification published on **25th August, 2011** in the Gazette of India and the same is as under:-

Any candidate who fails in one subject in an Examination is permitted to go to the next higher class and appear for the subject and complete it successfully before he is permitted to appear for the next higher examination. However, the Dental Council of India would have no objection, if the concerned follows their examination scheme (2nd year onwards) provided in their statute/regulations.

IV B.D.S. Examination:

- ~~1. Oral Medicine and radiology~~
- ~~2. Paediatric & Preventive Dentistry~~
- ~~3. Orthodontics & dentofacial orthopaedics~~
- ~~4. Periodontology~~

The above has been substituted in terms of (3rd Amendment) notification published on **25th August, 2011** in the Gazette of India and the same is as under:-

Final BDS (Fourth Year):

- Public Health Dentistry
 - Periodontology
 - Orthodontics and Dentofacial Orthopaedic
 - Oral Medicine and Radiology
 - Oral & Maxillofacial Surgery
 - Conservative and Endodontics
 - Prosthodontics and Crown & Bridge
 - Paediatric and Preventive Dentistry
- OR

Part-I

- Public Health Dentistry
- Periodontology
- Orthodontics and Dentofacial Orthopaedic
- Oral Medicine and Radiology

Part-II

- Oral & Maxillofacial Surgery
- Conservative and Endodontics
- Prosthodontics and Crown & Bridge
- Paediatric and preventive Dentistry

Note:-

1. The concerned Universities may opt for any one of the examination pattern mentioned above in 4th BDS final year.
2. If any University opt for the part examination system then any candidate who fails in any subject in 4th (final) year Part-I examination is permitted to go to the Part-II examination and should complete both parts successfully before he/she is permitted to go for Internship programme.
3. Since there are Inadequate teaching staffs in Department of Public Health Dentistry, the same may be clubbed together under the head of periodontics. This arrangement shall be reviewed after three years.

V BDS Examination:

1. ~~Prosthodontics and Crown & Bridge~~
2. ~~Conservative Dentistry and Endodontics~~
3. ~~Oral and Maxillofacial Surgery~~
4. ~~Public Health Dentistry~~

The V BDS examination has been deleted in terms of (3rd Amendment) notification published on 25th August, 2011 in the Gazette of India.

WRITTEN EXAMINATION:

1. The written examination in each subject shall consist of one paper of three hours duration and shall have maximum marks of 70.
2. In the subjects of Physiology & Biochemistry and Pathology & Microbiology each paper will be divided into two parts, A and B of equal marks.
3. The question paper should contain different types of questions like essay, short answer and objective type / M.C.Q's.
4. The nature of questions set, should be aimed to evaluate students of different standards ranging from average to excellent.
5. The questions should cover as broad an area of the content of the course. The essay questions should be properly structured and the marks specifically allotted.
6. The University may set up a question bank

PRACTICAL AND CLINICAL EXAMINATION:

1. **Objective Structured Clinical Evaluation:** The present system of conducting practical and clinical examination at several universities provide chance for unrealistic proportions of luck. Only a particular clinical procedure or experiment is usually given for the examination. The clinical and practical examination should provide a number of chances for the candidate to express one's skills. A number of examination stations with specific instructions to be provided. This can include clinical procedures, laboratory experiments, spotters etc. Evaluation must be made objective and structured. The method of objective structured clinical examinations should be followed. This will avoid examiner bias because both the examiner and the examinee are given specific instructions on what is to be observed at each station.
2. **Records/ Log Books:** The candidate should be given credit for his records based on the scores obtained in the record. The marks obtained for the record in the first appearance can be carried over to the subsequent appearances if necessary.
3. **Scheme of clinical and practical examinations:** The specific scheme of clinical and practical examinations, the type of clinical procedures/ experiments to be performed and marks allotted for each are to be discussed and finalized by the Chairman and other examiners and it is to be published prior to the conduct of the examinations along with the publication of the time table for the practical examinations. This scheme should be brought to the notice of the external examiner as and when the examiner reports. The practical and clinical examinations should be evaluated by two examiners of which one shall be an external examiner appointed from other universities preferably outside the State. Each candidate should be evaluated by each examiner independently and marks computed at the end of the examination.
4. **Viva Voce:** Viva voce is an excellent mode of assessment because it permits a fairly broad coverage and it can assess the problem solving capacity of the student. An assessment related to the affective domain is also possible through viva voce. It is desirable to conduct the viva voce

independently by each examiner. In order to avoid vagueness and to maintain uniformity of standard and coverage, questions can be pre-formulated before administering them to each student. Twenty marks are exclusively allotted for viva voce and that can be divided equally amongst the examiners, i.e., 10 marks per examiner.

MARKS DISTRIBUTION IN EACH SUBJECT :

Each subject shall have a maximum of 200 marks.

Theory	100
Practical/ Clinical	100

Theory – 100

University written exam	70
Viva Voce	20
Internal assessment (Written)	10

Total	100

Practicals/ clinicals – 100

University Exam	90
Internal assessment (Written)	10

Total	100

Practical and Viva Voce Only in University Examination

Pre-clinical Prosthodontics

Pre-clinical Conservative Dentistry.....

Internal Assessment	-	20
Practical	-	60
Viva Voce	-	20

		100

Criteria for a pass:

Fifty percent of the total marks in any subject computed as aggregate for theory, i.e., written, viva voce and internal assessment and practicals including internal assessment, separately is essential for a pass in all years of study.

For declaration of pass in a subject, a candidate shall secure 50% marks in the University examination both in Theory and Practical/ Clinical examinations separately, as stipulated below:

- A candidate shall secure 50% marks in aggregate in University theory including Viva Voce and Internal assessment obtained in University written examination combined together.
- In the University Practical/ clinical examination, a candidate shall secure 50% of University practical marks and Internal Assessment combined together.
- In case of pre clinical Prosthetic Dentistry and Pre clinical conservative dentistry in II BDS, where there is no written examination, minimum for pass is 50% of marks in Practical and Viva voce combined together in University examination including Internal Assessment i.e. 50/100 marks.
- Successful candidates who obtain 65% of the total marks or more shall be declared to have passed the examination in First Class. Other successful candidates will be placed in Second Class. A candidate who obtains 75% and above is eligible for Distinction. Only those candidates who pass the whole examination in the first attempt will be eligible for distinction or class.
- First Class and Distinction etc. to be awarded by the University as per their respective rules.

Grace Marks: Grace marks upto a maximum of 5 marks may be awarded to students who have failed only in one subject but passed in all other subjects.

Re-evaluation: The objective of re-evaluation is to ensure that the student receives a fair evaluation in the university examination and to minimize human error and extenuating circumstances. There shall be two mechanisms for this purpose.

1. **Re-totaling:** The University on application and remittance of a stipulated fee to be prescribed by the university, shall permit a recounting or opportunity to recount the marks received for various questions in an answer paper/ papers for theory of all subjects for which the candidate has appeared in the university examination. Any error in addition of the marks awarded if identified should be suitably rectified.
2. **Re-evaluation:** Re-evaluation of theory papers in all years of study of the BDS course may be permissible by the university on application and remittance of a prescribed fee. Such answer script shall be re-evaluated by not less than two duly qualified examiners and the average obtained shall be awarded to the candidate and the result accordingly reconsidered. However in those universities where double evaluation provision exists, this provision of re-evaluation will not be applicable.

Qualification and experience to be eligible for examinership for BDS examination

1. M.D.S. Degree from a recognized Institution
2. 4 years teaching experience in the subject in a dental college after MDS

3. Should be holding the post of a Reader or above in a Dental Institution approved/recognised by the Dental Council of India for B.D.S.

Note:

1. In case of Public Health Dentistry, as there is acute shortage of teachers one examiner from Public Health Dentistry and the second one could be from Periodontics. To be reviewed after three years.
2. In case of Physiology and Biochemistry if Internal examiner is from Physiology, External examiner should be from Biochemistry or vice versa
3. In case of Pathology and Microbiology if Internal examiner is from Pathology, External examiner should be from Microbiology or vice versa
4. In case of Dental Materials, if internal is from Prosthodontics, external should be from Conservative Dentistry and vice versa

50% of Examiners appointed shall be external from Dental Institutions approved/recognised by the Dental Council of India for B.D.S. Course, from other University, preferably from outside the State.

Reciprocal arrangement of Examiners should be discouraged, in that, the Internal Examiner in a subject should not accept external examinership for a College from which External Examiner is appointed in his subject for the corresponding period.

No person shall be an external Examiner to the same University for more than 3 consecutive years. However, if there is a break of one year the person can be re-appointed.

“Minimum Physical Requirement and Minimum Staffing Pattern (as per DCI Regulations 2006).”

GOALS AND OBJECTIVES

GOALS:

The dental graduates during training in the institutions should acquire adequate knowledge, necessary skills and reasonable attitudes which are required for carrying out all activities appropriate to general dental practice involving the prevention, diagnosis and treatment of anomalies and diseases of the teeth, mouth, jaws and associated tissues. The graduate also should understand the concept of community oral health education and be able to participate in the rural health care delivery programmes existing in the country.

OBJECTIVES:

The objectives are dealt under three headings (a) Knowledge and understanding (b) skills and (c) Attitudes.

(A) KNOWLEDGE AND UNDERSTANDING:

The graduate should acquire the following during the period of training.

1. Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions and be able to evaluate and analyse scientifically various established facts and data.
2. Adequate knowledge of the development, structure and function of the teeth, mouth and jaws and associated tissues both in health and disease and their relationship and effect on general state of health and also bearing on physical and social well being of the patient.
3. Adequate knowledge of clinical disciplines and methods which provide a coherent picture of anomalies, lesions and diseases of the teeth, mouth and jaws and preventive diagnostic and therapeutic aspects of dentistry.
4. Adequate clinical experience required for general dental practice.
5. Adequate knowledge of the constitution, biological function and behaviour of persons in health and sickness as well as the influence of the natural and social environment on the state of health in so far as it affect dentistry.

(B) SKILLS:

A graduate should be able to demonstrate the following skills necessary for practice of dentistry.

1. Able to diagnose and manage various common dental problems encountered in general dental practice keeping in mind the expectations and the right of the society to receive the best possible treatment available wherever possible.
2. Acquire the skill to prevent and manage complications if encountered while carrying out various surgical and other procedures.
3. Possess skill to carry out certain investigative procedures and ability to interpret laboratory findings.
4. Promote oral health and help prevent oral diseases where possible.
5. Competent in the control of pain and anxiety among the patients during dental treatment.

(C) ATTITUDES:

A graduate should develop during the training period the following attitudes.

1. Willing to apply the current knowledge of dentistry in the best interest of the patients and the community.
2. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
3. Seek to improve awareness and provide possible solutions for oral health problems and needs through out the community.
4. Willingness to participate in the CPED Programmes to update the knowledge and professional skill from time to time.
5. To help and participate in the implementation of the national oral health policy.

RECOMMENDATIONS

GENERAL:

1. The undergraduate course involves organisation of teaching programmes year-wise. However, this course, as a whole, should demonstrate integration of the basic sciences, clinical dentistry and practical or the laboratory skills. The course should be designed and integrated in such a way to permit smooth progression from pre-clinical to clinical phase. Collaboration should be encouraged between teachers of basic sciences, dental sciences and clinical subjects.
2. The undergraduate dental course consists of three main components. The first component consists subjects common to medicine and dentistry like anatomy, physiology, biochemistry and behavioural science, leading to pharmacology, pathology, microbiology and then on to general medicine and general surgery. The second component runs concurrently with the first and deals with special aspects of oral and dental tissues, oral biology and oral pathology. Finally, the third component based on the foundations of the first two, deals with the clinical and technical aspects of dentistry as is required for general dental practice.
3. The first component of the course is intended to provide initially, an appreciation of normal human structure, development, function and behaviour, leading to understanding of the diseases, its prevention and treatment. The main objective is to provide the student a broad knowledge of the normal structures and functions of the body, the alterations which take place in disease with particular reference to those conditions in which medical and dental co-operation is essential for proper management. At this stage, the student should also be made aware of the social and psychological aspects of patient care with special reference to the relationship between dentist and patient. The behavioural sciences including both sociology and psychology should be introduced at the initial stages of the training programme, much before the students actually deal with the patients.
4. The second component of dental undergraduate programme consists instruction in the subjects dealing with dental and oral aspects to ensure a detailed knowledge of the structure and function of the dental and oral tissues. This enables the student to diagnose, prevent and treat the dental and oral diseases and disorders which were not included in the first component. The subject of oral biology is to be introduced at this level to provide the students a comprehensive knowledge and application of oral physiology, microbiology, biochemistry and oral immunology. Students should be exposed to the basic aspects of forensic odontology at this stage of the course along with oral biology/oral pathology.
5. The third component of the course comprising the clinical and technical aspects of dentistry actually prepares the student to undertake total oral and dental health care of the patients of all ages. The emphasis at this stage should be on the prevention of the various dental diseases and how to preserve natural teeth with their supporting structures. The importance of the various preventive methods need to be stressed. The significance of diagnosis of various dental and oral problems needs to be emphasized along with treatment planning before actual treatment procedures are undertaken.

In addition to acquiring the knowledge, the students need to gain adequate clinical hands-on-experience in extractions and other minor oral surgical procedures, all aspects of conservative dentistry, endodontics, crown and bridge, provision of partial and complete dentures, various periodontal therapeutic procedures and use of removable orthodontic appliances. Familiarity with various radiological techniques, particularly intra-oral methods and proper interpretation of the radiographs, is an essential part of this component of training and has application in clinical diagnosis, forensic identification and age estimation.

Towards the final stage of the clinical training, each student should be involved in comprehensive oral health care or holistic approach to enable them to plan and treat patients as a whole, instead of piece-meal treatment provided in each speciality. The Dental Council of India strongly recommends that all the dental colleges should provide facilities and required infrastructure for this purpose.

The aim of the undergraduate programme should undoubtedly be to produce a graduate, competent in general dental practice.

6. The commitment towards the society as a whole, needs to be stressed along with the knowledge and treatment skills gained. Instruction in public health dentistry should emphasise the sociological aspects of health care particularly, oral health care, including the reasons for the

variation in oral and dental needs of different sections of the society. It is important to know the influence of the social, behavioural, environmental and economic factors on oral and dental health. Students should be made aware of the National oral health Policy and the importance of being a member of the Health care team delivering medical and oral health care particularly among rural population.

7. Scientific advancement of any profession is based largely on continuous research activities. Dentistry is no exception. It is important that in every dental college proper facilities should be provided for research and the faculty members should involve themselves in such activities. Inter-disciplinary research should be encouraged to bring in integration among various specialities. The teaching and training methodology should be such that the students are motivated to think and indulge in self study rather than playing a passive role. Provision should be made in the daily schedules for adequate time for reading. Proper library facilities with adequate timings and seating capacity should be made available in all dental colleges. Adequate audio visual aids, like video tapes, computer assisted learning aids, Medline and internet facilities should be provided in all dental colleges to encourage self-study. Students should be encouraged to participate in simple research project work and the system of electives, spending some stipulated amount of time in another dental college within the country or outside should be given a serious consideration by all the dental institutions.
8. The society has a right to expect high standards and quality of treatment. Hence, it is mandatory and a social obligation for each dental surgeon to upgrade his or her knowledge and professional skills from time to time. The Dental Council of India strongly recommends that facilities and proper infrastructure should be developed to conduct the continuous professional education programmes in dentistry to enable the practitioners to update their knowledge and skills. The Council is of the opinion that the dental colleges by virtue of their infrastructural facilities will be ideal to conduct such courses and recommends establishment of a Department of continuing dental education in each of the dental colleges. In addition, the practitioners should be encouraged to attend conferences of state and national level, workshops, seminars and any other such activity which the Council feels is suitable to upgrade the knowledge and skills.
9. The undergraduate curriculum should stress the significance of infection and cross- infection control in dental practice. Aspects like sources of infection, measures to be adopted both general and specific for control particularly the HIV and hepatitis should be properly incorporated into the curriculum so that the graduates are aware of its significance and follow it in their practice.
10. The information technology has touched every aspect of an individual's personal and professional life. The Council hence recommends that all undergraduates acquire minimum computer proficiency which will enable them to enhance their professional knowledge and skills.

RECOMMENDATIONS

SPECIFIC:

1. The undergraduate dental training programme leading to B.D.S. degree shall be a minimum of five years duration. During this period, the students shall be required to engage in full time study at a dental college recognized or approved by the Dental Council of India.

During the five years undergraduate course, the instruction in clinical subjects should be at least for three years

2. Basic Medical & Dental Subjects:

The basic medical and dental sciences comprise anatomy gross and microscopic, physiology, biochemistry, pharmacology, oral biology and science of dental materials. Subjects like behavioural sciences, which is useful to develop communication skills, should also be introduced in the first year itself and spread over the undergraduate course. An introduction to Public Health Dentistry & Preventive Dentistry also will be useful to develop the concept of commitment to community. The laboratory skills to be developed by the students like pre-clinical Prosthodontics, Crown Bridge, Aesthetic Dentistry and Oral Implantology exercises and studying dental morphology also is a part of initial training. The instruction in the above medical and dental sciences shall be for two years duration. At the end of this period the student should be in a position to understand and comprehend in general the development, structure and function of the human body in both health and disease.

3. The instruction in basic dental sciences should include theoretical and practical aspects of oral anatomy and physiology, to provide a detailed knowledge of the form and structure of teeth associated tissues and occlusal relationships.

The study should also aim at development of a concept regarding physiological and biochemical processes relevant to oral cavity for better understanding of the changes which occur with the onset of disease in the oral cavity.

The student should be made aware of the importance of various dental tissues in forensic investigation.

4. Clinical, Medical and Dental subjects:

The students should be introduced to clinics in the initial stage, preferably in the first year, as an observer to familiarise with clinical set-up and working. The period of instruction in the clinical subjects shall be not less than three years full time. During this, the student shall attend a dental hospital, general hospital, community camps and satellite clinics, in order to obtain instruction and experience in the practice of dentistry. The main objective of training in clinical dental subjects is to produce a graduate able and competent to recognize or diagnose various dental and oral diseases, to undertake general dental treatment, advise on the provision of specialized treatment available and finally advise the patient on prevention. The student should also understand the relationship between oral and systemic diseases.

5. The general medicine and surgery training should provide sufficient knowledge on human disease to enable the student to understand its manifestations as relevant to the practice of dentistry. This requires clinical teaching on patients and shall be carried out in in-patient and outpatient medical departments and specialist clinics.

This clinical instruction should enable the student to understand and perhaps diagnose common systemic diseases which have relevance to dental practice, by adopting a systematic approach of history taking and clinical examination. The student should also realize the significance of various general and special investigations in the diagnosis of diseases. The ability to recognize physical and mental illness, dealing with emergencies, effective communication with patients, interaction with various professional colleges also become important aspects of this training.

6. The Dental Council of India considers it important for all dental students to receive instruction in first-aid and principles of cardio-pulmonary resuscitation. It is also desirable that the student spend time in an accident and emergency department of a general hospital.

7. The purpose of the clinical training is to provide sufficient practical skill in all aspects of clinical dentistry. The instruction should also include patient management skills, treatment of patients of all ages with special reference to children (paediatric), very elderly (geriatric), medically compromised and disabled patients.

8. During the three years clinical course, the students should receive thorough instruction which involves history taking, diagnosis and treatment planning in all aspects of dentistry and should be competent on graduation to carry out all routine general procedures.

In Oral & Maxillofacial Surgery and Oral Implantology, instruction should include the knowledge of various maxillofacial problems like injuries, infections and deformities of the jaws and associated structures. The clinical experience should include those procedures commonly undertaken in general practice like extraction of teeth, minor oral surgical procedure etc.

In Conservative, Endodontics & Aesthetic Dentistry, Prosthodontics, Crown Bridge, Aesthetic Dentistry and Oral Implantology and Periodontology and Oral Implantology students should be competent on graduation to carry out routine treatment like restorations of various kinds, endodontic procedures, removable and fixed prosthodontics, concept of osseointegration and finally various kinds of periodontal therapy. In addition, students should be aware of their limitations on graduation, need to refer patients for consultant opinion and/or treatment and also the need for postgraduate and continuous education programmes.

In Orthodontics & Dento Facial Orthopedics, students should carry out simple appliance therapy for patients. Students should also be able to appreciate the role of dentofacial growth in the development and treatment of malocclusion.

In Paediatric dentistry, the students should concentrate on clinical management, efficacy of preventive measures, treatment needs particularly for children with disabilities. In oral medicine and oral diagnosis, the student should receive instruction in various lesions, occurring in the oral cavity with particular reference to oral cancer.

9. The successful control and management of pain is an integral part of dental practice. Upon graduation the students should be competent to administer all forms of local anaesthesia. The value of behavioural methods of anxiety management should be emphasised. The students should also have the practical experience in the administration of intra-muscular and intravenous injections. Knowledge of pain mechanisms and strategies to control post-operative pain is essential for practice of dentistry.

10. All students should receive instructions and gain practical experience in taking processing and interpretation of various types of intra and extra oral radiographs. They should be aware of the hazards of radiation and proper protective measures from radiation for the patient, operator and other staff.

11. Instruction should be given in dental jurisprudence, legal and ethical obligations of dental practitioners and the constitution and functions of Dental Council of India.
12. Infection and cross infection control assume significance in dental practice. The students should be made aware of the potential risk of transmission in the dental surgery, various infectious diseases particularly HIV and hepatitis. The students should be aware of their professional responsibility for the protection of the patients, themselves and their staff and the requirements of the health and safety regulations.
13. In the recent times, the subjects of esthetic dentistry, oral implantology, behavioural sciences and forensic odontology have assumed great significance. Hence, the Council recommends that these four specialities should be incorporated into the undergraduate curriculum. The instruction and clinical training in aesthetic dentistry shall be carried out by the departments of Conservative, Endodontics & Aesthetic Dentistry and prosthodontics, Crown Bridge, Aesthetic Dentistry and Oral Implantology. Similarly, the instruction and clinical training in oral implantology shall be done by the departments of Oral & Maxillofacial Surgery, Prosthodontics, Crown Bridge, Aesthetic Dentistry and Oral Implantology and Periodontology and Oral Implantology. The instruction in behavioural sciences should ideally commence before the students come in contact with the patients and shall be carried out by the departments of Public Health Dentistry & Preventive Dentistry and Pedodontics & Preventive Dentistry. Forensic Odontology will be a part of Oral Pathology & Oral Microbiology and Oral Medicine and Radiology.

COMPETENCIES

At the completion of the undergraduate training programme the graduates shall be competent in the following.-

General Skills

- Apply knowledge & skills in day to day practice
- Apply principles of ethics
- Analyze the outcome of treatment
- Evaluate the scientific literature and information to decide the treatment
- Participate and involve in professional bodies
- Self assessment & willingness to update the knowledge & skills from time to time
- Involvement in simple research projects
- Minimum computer proficiency to enhance knowledge and skills
- Refer patients for consultation and specialized treatment
- Basic study of forensic odontology and geriatric dental problems

Practice Management

- Evaluate practice location, population dynamics & reimbursement mechanism
- Co-ordinate & supervise the activities of allied dental health personnel
- Maintain all records
- Implement & monitor infection control and environmental safety programs
- Practice within the scope of one's competence

Communication & Community Resources

- Assess patients goals, values and concerns to establish rapport and guide patient care
- Able to communicate freely, orally and in writing with all concerned
- Participate in improving the oral health of the individuals through community activities.

Patient Care – Diagnosis

- Obtaining patient's history in a methodical way
- Performing thorough clinical examination
- Selection and interpretation of clinical, radiological and other diagnostic information
- Obtaining appropriate consultation
- Arriving at provisional, differential and final diagnosis

Patient Care – Treatment Planning

- Integrate multiple disciplines into an individual comprehensive sequence treatment plan using diagnostic and prognostic information
- Able to order appropriate investigations

Patient Care – Treatment

- Recognition and initial management of medical emergencies that may occur during Dental treatment
- Perform basic cardiac life support
- Management of pain including post operative
- Administration of all forms of local anaesthesia
- Administration of intra muscular and venous injections
- Prescription of drugs, pre operative, prophylactic and therapeutic requirements

Uncomplicated extraction of teeth
 Transalveolar extractions and removal of simple impacted teeth
 Minor oral surgical procedures
 Management of Oro-facial infections
 Simple orthodontic appliance therapy
 Taking, processing and interpretation of various types of intra oral radiographs
 Various kinds of restorative procedures using different materials available
 Simple endodontic procedures
 Removable and fixed prosthodontics
 Various kinds of periodontal therapy

ORAL MEDICINE & RADIOLOGY

- Able to identify precancerous and cancerous lesions of the oral cavity and refer to the concerned speciality for their management
- Should have an adequate knowledge about common laboratory investigations and interpretation of their results.
- Should have adequate knowledge about medical complications that can arise while treating systemically compromised patients and take prior precautions/ consent from the concerned medical specialist.
- Have adequate knowledge about radiation health hazards, radiations safety and protection.
- Competent to take intra-oral radiographs and interpret the radiographic findings
- Gain adequate knowledge of various extra-oral radiographic procedures, TMJ radiography and sialography.
- Be aware of the importance of intra- and extra-oral radiographs in forensic identification and age estimation
- Should be familiar with jurisprudence, ethics and understand the significance of dental records with respect to law

PAEDIATRIC & PREVENTIVE DENTISTRY

- Able to instill a positive attitude and behaviour in children towards oral health and understand the principles of prevention and preventive dentistry right from birth to adolescence.
- Able to guide and counsel the parents in regards to various treatment modalities including different facets of preventive dentistry.
- Able to treat dental diseases occurring in child patient.
- Able to manage the physically and mentally challenged disabled children effectively and efficiently, tailored to the needs of individual requirement and conditions.

ORTHODONTICS & DENTOFACIAL ORTHOPAEDICS

- Understand about normal growth and development of facial skeleton and dentition.
- Pinpoint aberrations in growth process both dental and skeletal and plan necessary treatment
- Diagnose the various malocclusion categories
- Able to motivate and explain to the patient (and parent) about the necessity of treatment
- Plan and execute preventive orthodontics (space maintainers or space regainers)
- Plan and execute interceptive orthodontics (habit breaking appliances)
- Manage treatment of simple malocclusion such as anterior spacing using removable appliances
- Handle delivery and activation of removable orthodontic appliances
- Diagnose and appropriately refer patients with complex malocclusion to the specialist

PERIODONTOLOGY

- Diagnose the patients periodontal problem, plan and perform appropriate periodontal treatment
- Competent to educate and motivate the patient
- Competent to perform thorough oral prophylaxis, subgingival scaling, root planning and minor periodontal surgical procedures
- Give proper post treatment instructions and do periodic recall and evaluation
- Familiar with concepts of osseointegration and basic surgical aspects of implantology

PROSTHODONTICS AND CROWN & BRIDGE

- Able to understand and use various dental materials
- Competent to carry out treatment of conventional complete and partial removable dentures and fabricate fixed partial dentures
- Able to carry out treatment of routine prosthodontic procedures.
- Familiar with the concept of osseointegration and the value of implant-supported Prosthodontic procedures

CONSERVATIVE DENTISTRY AND ENDODONTICS

- Competent to diagnose all carious lesions
- Competent to perform Class I and Class II cavities and their restoration with amalgam
- Restore class V and Class III cavities with glass ionomer cement
- Able to diagnose and appropriately treat pulpally involved teeth (pulp capping procedures)
- Able to perform RCT for anterior teeth
- Competent to carry out small composite restorations
- Understand the principles of aesthetic dental procedures

ORAL & MAXILLOFACIAL SURGERY

- Able to apply the knowledge gained in the basic medical and clinical subjects in the management of patients with surgical problems
- Able to diagnose, manage and treat patients with basic oral surgical problems
- Have a broad knowledge of maxillofacial surgery and oral implantology
- Should be familiar with legal, ethical and moral issues pertaining to the patient care and communication skills
- Should have acquired the skill to examine any patient with an oral surgical problem in an orderly manner
- Understand and practice the basic principles of asepsis and sterilisation
- Should be competent in the extraction of the teeth under both local and general anaesthesia
- Competent to carry out certain minor oral surgical procedure under LA liketrans-alveolar extraction, frenectomy, dento alveolar procedures, simple impaction, biopsy, etc.
- Competent to assess, prevent and manage common complications that arise during and after minor oral surgery
- Able to provide primary care and manage medical emergencies in the dental office
- Familiar with the management of major oral surgical problems and principles involved in the in-patient management

PUBLIC HEALTH DENTISTRY

- Apply the principles of health promotion and disease prevention
- Have knowledge of the organization and provision of health care in community and in the hospital service
- Have knowledge of the prevalence of common dental conditions in India.
- Have knowledge of community based preventive measures
- Have knowledge of the social, cultural and env. Factors which contribute to health or illness.
- Administer and hygiene instructions, topical fluoride therapy and fissure sealing.
- Educate patients concerning the aetiology and prevention of oral disease and encourage them to assure responsibility for their oral health.

MINIMUM WORKING HOURS FOR EACH SUBJECT OF STUDY
(B.D.S COURSE)

The following has been substituted in terms of (3rd Amendment) notification published on **25th August,2011** in the Gazette of India and the same is as under:-

Subjects	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General Human Anatomy Including Embryology, Osteology and Histology.	100	175		275
General Human Physiology	120	60		180
Biochemistry	70	60		130
Dental Materials	80	240		320
Dental Anatomy Embryology, and Oral Histology	105	250		355
Dental Pharmacology & Therapeutics	70	20		90
General Pathology	55	55		110
Microbiology	65	50		115
General Medicine	60		9	150
General Surgery	60		90	150
Oral Pathology & Microbiology	145	130		275
Oral Medicine & Radiology	65		200	265
Paediatric & Preventive Dentistry	65		200	265
Orthodontics & dental orthopaedics	50		200	250
Periodontology	80		200	280
Oral & Maxillofacial Surgery	70		360	430
Conservative Dentistry & Endodontics	135	200	460	795
Prosthodontics & Crown & Bridge	135	300	460	895
Public Health Dentistry	60		290	350
Total	1590	1540	2550	5680

Note:

There should be a minimum of 240 teaching days every year consisting of 8 working hours including one hour of lunch break.

Subjects	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General Human Anatomy Including Embryology, Osteology and Histology.	100	175		275
General Human Physiology	120	60		180
Biochemistry	70	60		130
Dental Materials	80	240		320
Dental Anatomy Embryology, and Oral Histology	105	250		355
Dental Pharmacology & Therapeutics	70	20		90
General Pathology Microbiology	55	55		110
	65	50		115
General Medicine	60		9	150
General Surgery	60		90	150
Oral Pathology & Microbiology	145	130		275
Oral Medicine & Radiology	65		170	235
Paediatric & Preventive Dentistry	65		170	235
Orthodontics & dental orthopaedics	50		170	220
Periodontology	80		170	250
Oral & Maxillofacial Surgery	70		270	340
Conservative Dentistry & Endodontics	135	200	370	705
Prosthodontics & Crown & Bridge	135	300	370	805
Public Health Dentistry including Lectures on Tobacco Control & Habit Cessation	60		200	260
Total	1590	1540	1989	5200

Note:

There should be a minimum of 240 teaching days each academic year consisting of 8 working hours, including one hour of lunch break.

Internship – 240x8 hours-1920 clinical hours

MINIMUM WORKING HOURS FOR EACH SUBJECT OF STUDY
(B.D.S COURSE)

I B.D.S

Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General Human Anatomy Including Embryology, Osteology and Histology	100	175		275
General Human Physiology	120	60		180
Biochemistry.	70	60		130
Dental Anatomy Embryology, and Oral Histology	105	250		355
Dental Materials	20	40		60
Pre clinical Prosthodontics & Crown & Bridge	-	100		100
Total	415	685		1100

II B.D.S

Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General & Dental Pharmacology and therapeutics	70	20		90
General Pathology	55	55		110
Microbiolog	65	50		115
Dental Materials	60	200		260
Oral Pathology and Oral Microbiology	25	50		75
Pre Clinical Prosthodontics & Crown & Bridge	25	200		225
Pre Clinical Conservative Dentistry	25	200		225
Total	325	775		1100

III B.D.S

Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General Medicine	60		90	150
General Surgery	60		90	150
Oral Pathology and Oral Microbiology	120	80		200
Oral Medicine and Radiology	20		70	90
Paediatric and Preventive Dentistry	20		70	90
Orthodontics & Dentofacial Orthopaedics	20		70	90
Periodontology	30		70	100
Oral & Maxillofacial Surgery.	20		70	90
Conservative Dentistry & Endodontics.	30		70	100
Prosthodontics and Crown & Bridge	30		70	100
Total	410		750	1160

IV B.D.S

The following has been substituted in terms of (3rd Amendment) notification published on **25th August,2011** in the Gazette of India and the same is as under:-

Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
Oral Medicine and Radiology	45		130	175
Paediatric and Preventive Dentistry	45		130	175
Orthodontics & Dentofacial Orthopaedics	30		130	160
Periodontology	50		130	180
Oral & Maxillofacial Surgery.	20		90	110
Conservative Dentistry & Endodontics.	30		90	120
Prostodontics and Crown & Bridge	30		90	120
Public Health Dentistry	30		90	120
Total	280		880	1160

Subjects	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
Prosthodontics	80		300	380
Oral Medicine	45		100	145
Periodontics	50		100	150
Public Health	60		200	260
Conservative Dentistry	80		300	380
Oral Surgery	50		200	250
Orthodontics	30		100	130
Pedodontics	45		100	145
Total	440		1400	1840

Provided that nothing contained in the provision of this regulations or statue or rules, regulations or guidance or notifications of the concerned university, or any other law for the time being in force shall prevent any student pursuing his/her 4th year BDS Course who fails in any one or more subjects of 1st semester will carry over those subjects to the 2nd Semester and will appear in those subjects together with the subjects of the 2nd semester. A pass in all the eight subjects is mandatory for completion of the 4th BDS Course before undergoing internship programme.

The following teaching Hours as prescribed for "V BDS" Course has been deleted in terms of (3rd Amendment) notification published on **25th August,2011** in the Gazette of India.

V B.D.S

Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
Oral & Maxillofacial Surgery.	30		200	230

Conservative Dentistry & Endodontics.	50		300	350
Prostodontics and Crown & Bridge	50		300	350
Public Health Dentistry	30		200	230
Total	160		1000	1160

The following has been substituted only for Punjab and Andhra Pradesh in terms of (3rd Amendment) notification published on **25th August,2011** in the Gazette of India

Only 2007 batch (Punjab & Andhra Pradesh) will have to follow the existing 5th year only programme.

Thereafter this 3rd amendment will be applicable.

Provided the concerned University follows the proposed amendment.

Note:

The following footnote has been modified/deleted as under in terms of (3rd Amendment) notification published on **25th August,2011** in the Gazette of India:-

- * Behavioral Sciences Classes shall commence in 1st Year.
- * Forensic odontology shall be covered in the department of Oral pathology and Oral Medicine during 3rd Year.
- * Esthetic Dentistry shall be covered in the Departments of Conservative Dentistry and Prosthodontics during 4th & 5th Year.
- * Oral Implantology shall be covered in the Department of Maxillofacial Surgery, Prosthodontics & Crown & Bridge and Periodontology during 4th & 5th Years.
- * Ethics and dental jurisprudence shall be covered in Public Health Dentistry in 4th and 5th years.
- * Electives / Research work should be encouraged during the 5th Year lasting for a period of atleast one month to be spent in a different dental institution in India / overseas.
- ~~* All the institutions shall compulsorily make arrangements for Comprehensive oral health care training for atleast 3 months during 5th Year. The department of Public Health Dentistry may be utilised in case, the institution does not have separate department for this purpose. Qualified faculty members from the departments of Prosthodontics, Conservative and periodontics should guide the students along with faculty of Public Health Dentistry Department.~~
- * The minimum working hours indicated each year of study does not include one month mid year vacation and one month of university examination.

It is the prerogative of the Dental Council of India to conduct inspections, at any of the colleges, at any time during the calendar year for inspecting whether the colleges are following the internship norms as laid down by DCI.

RECOMMENDED BOOKS

1. **Human Anatomy, Embryology, Histology & Medical Genetics**
 1. SNELL (Richard S.) Clinical Anatomy for Medical Students, Ed. 5, Little Brown & company, Boston.
 2. RJ LAST'S Anatomy – McMinn, 9th edition.
 3. ROMANES(G.J.) Cunningham Manual of Practical Anatomy : Head & Neck & Brain Ed.15.Vol.III, Oxford Medical publication.
 4. WHEATER,BURKITT & DANIELS, Functional Histology, Ed. 2, Churchill Livingstone.
 5. SADLER , LANGMAN'S, Medical Embryology, Ed. 6.
 6. JAMES E ANDERSON, Grant's Atlas of Anatomy. Williams & Wilkins.
 7. WILLIAMS, Gray's Anatomy, Ed.38. ,Churchill Livingstone.
 8. EMERY,Medical Genetics.
2. **Physiology**
 1. Guyton; Text book of Physiology, 9th edition.
 2. Ganong; Review of Medical Physiology, 19th edition
 3. Vander; Human physiology, 5th edition
 4. Choudhari; Concise Medical Physiology, 2nd edition
 5. Chaterjee; Human Physiology, 10th edition
 6. A.K. Jain; Human Physiology for BDS students, 1st edition
 7. Berne & Levey; Physiology, 2nd edition
 8. West-Best & Taylor's, Physiological basis of Medical Practise, 11th edition

EXPERIMENTAL PHYSIOLOGY:

1. Rannade; Practical Physiology, 4th edition
2. Ghai; a text book of practical physiology
3. Hutchison's; Clinical Methods, 20th edition

3. Biochemistry

1. Concise text book of Biochemistry (3rd edition) 2001, T.N. Pattabiraman
2. Nutritional Biochemistry 1995, S. Ramakrishnan and S.V. Rao
3. Lecture notes in Biochemistry 1984, J.K. Kandlish

REFERENCE BOOKS:

1. Text book of Biochemistry with clinical correlations 1997, T.N. Devlin
2. Harper's Biochemistry, 1996., R.K. Murray et.al
Basic and applied Dental Biochemistry, 1979, R.A.D. Williams & J.C.Elliot

4. Dental Anatomy, Embryology and Oral Histology

1. Orban's Oral Histology & Embryology - S.N. Bhaskar
2. Oral Development & Histology - James & Avery
3. Wheeler's Dental Anatomy, Physiology & Occlusion - Major M. Ash
4. Dental Anatomy - its relevance to dentistry - Woelfel & Scheid
5. Applied Physiology of the mouth - Lavelle
6. Physiology & Biochemistry of the mouth - Jenkins

5. General Pathology

1. Robbins – Pathologic Basis of Disease Cotran, Kumar, Robbins
2. Anderson's Pathology Vol 1 & 2 Editors – Ivan Damjanov & James Linder
3. Wintrobe's clinical Haematolog Lee, Bithell, Foerster, Athens, Lukens

6. Microbiology

1. Text book of Microbiology – R.Ananthanarayan & C.K.Jayaram Paniker.
2. Medical Microbiology – David Greenwood et al.
3. Microbiology – Prescott, et al.
4. Microbiology – Bernard D. Davis , et al.
5. Clinical & Pathogenic Microbiology – Barbara J Howard, et al.
6. Mechanisms of Microbial diseases – Moselio Schaechter, et al.
7. Immunology an Introduction – Tizard
8. Immunology 3rd edition – Evan Roitt , et al.

7. Dental Materials

1. Phillips Science of Dental Materials – 10th edn.- Kenneth J. Anusavice
2. Restorative Dental Materials - 10 edn. Robert G.Craig
3. Notes on Dental Materials - E.C. Combe
4. Prep. Manual for undergraduates – Dental Materials – Dr. M.S. Koudi & Dr. SanjayGouda B. Patil

8. General and dental pharmacology and therapeutics

1. R.S.Satoskar, Kale Bhandarkar's Pharmacology and Pharmacolherapeutics, 10th Edition, Bombay Popular Prakashan 1991.
2. Bertam G Katzung, Basic and Clinical pharmacology 6th ed. Appleton & Lange 1997
3. Lauerence D.R. Clinical Pharmacology 8th ed. Churchill Livingstone 1997
4. Satoskar R.S. & Bhandarkar S.D., Pharmacology and Pharmaco Therapeutics part I & part ii, 13th Popular Prakashan Bombay 1993
5. Tripathi K.D., Essentials of Medical Pharmacology 4th ed Jaypee Brothers 1999.

9. General Medicine

Textbook of Medicine Davidson
Textbook of Medicine Hutchinson

10. General Surgery

Short practice of Surgery Baily & Love

11. Oral Pathology & Oral Microbiology

1. A Text Book of Oral Pathology Shafer, Hine & Levy
2. Oral Pathology - Clinical Pathologic correlations Regezi & Sciubba.
3. Oral Pathology Soames & Southam.
4. Oral Pathology in the Tropics Prabhu, Wilson, Johnson & Daftary

12. Public Health Dentistry

1. Dentistry Dental Practice and Community by David F. Striffler and Brain A. Burt, Edn. – 1983, W. B. Saunders Company
2. Principles of Dental Public Health by James Morse Dunning, IVth Edition, 1986, Harward University Press.

3. Dental Public Health and Community Dentistry Ed by Anthony Jong Publication by The C. V. Mosby Company 1981
4. Community Oral Health-A system approach by Patricia P. Cormier and Joyce I. Levy published by Appleton-Century-Crofts/ New York, 1981
5. Community Dentistry-A problem oriented approach by P. C. Dental Hand book series Vol.8 by Stephen L. Silverman and Ames F. Tryon, Series editor-Alvin F. Gardner, PSG Publishing company Inc. Littleton Massachuseltts, 1980.
6. Dental Public Health- An Introduction to Community Dentistry. Edition by Geoffrey L. Slack and Brain Burt, Published by John Wriqth and sons Bristol, 1980
7. Oral Health Surveys- Basic Methods, 4th edition, 1997, published by W. H. O. Geneva available at the regional office New Delhi.
8. Preventive Medicine and Hygiene-By Maxcy and Rosenau, published by Appleton Century Crofts, 1986.
9. Preventive Dentistry-by J. O. Forrest published by John Wright and sons Bristol, 1980.
10. Preventive Dentistry by Murray, 1997.
11. Text Book of Preventive and Social Medicine by Park and park, 14th edition.
12. Community Dentistry by Dr. Soben Peter.
13. Introduction to Bio-statistics by B. K. Mahajan
14. Introduction to Statistical Methods by Grewal

13. Paediatric and Preventive Dentistry

1. Pediatric Dentistry (Infancy through Adolescences) – Pinkham.
2. Clinical Use of Fluorides – Stephen H. Wei.
3. Understanding of Dental Caries – Niki Foruk.
4. Handbook of Clinical Pedodontics – Kenneth. D.
5. Dentistry for the Child and Adolescence – Mc. Donald.
6. Pediatric Dentistry – Damle S. G.
7. Behaviour Management – Wright
8. Traumatic Injuries – Andreason.
9. Textbook of Pedodontics – Dr. Shobha Tandon

14. Oral Medicine and Radiology

- a) Oral Diagnosis, Oral Medicine & Oral Pathology
 1. Burkit – Oral Medicine – J.B. Lippincott Company
 2. Coleman – Principles of Oral Diagnosis – Mosby Year Book
 3. Jones – Oral Manifestations of Systemic Diseases – W.B. Saunders company
 4. Mitchell – Oral Diagnosis & Oral Medicine
 5. Kerr – Oral Diagnosis
 6. Miller – Oral Diagnosis & Treatment
 7. Hutchinson – clinical Methods
 8. Oral Pathology – Shafers
 9. Sonis.S.T., Fazio.R.C. and Fang.L - Principles and practice of Oral Medicine
- b) Oral Radiology
 1. White & Goaz – Oral Radiology – Mosby year Book
 2. Weahrman – Dental Radiology – C.V. Mosby Company
 3. Stafne – Oral Roentgenographic Diagnosis – W.B.Saunders Co.,
- c) Forensic Odontology
 1. Derek H.Clark – Practical Forensic Odontology - Butterworth-Heinemann (1992)
 2. C Michael Bowers, Gary Bell – Manual of Forensic Odontology - Forensic Pr (1995)

15. Orthodontics and Dentofacial Orthopedics

1. Contemporary Orthodontics William R. Proffit
2. Orthodontics For Dental Students White And Gardiner
3. Handbook Of Orthodontics Moyers
4. Orthodontics - Principles And Practice Graber
5. Design, Construction And Use Of Removable Orthodontic Appliances C. Philip Adams
6. Clinical Orthodontics: Vol1 & 2 Salzman

16. Oral and Maxillofacial Surgery

1. Impacted teeth; Alling John F & etal.
2. Principles of oral and maxillofacial surgery; Vol.1,2 & 3 Peterson LJ & etal.
3. Handbook of medical emergencies in the dental office, Malamed SF.
4. Killeys Fractures of the mandible; Banks P.
5. Killeys fractures of the middle 3rd of the facial skeleton; Banks P.
6. Killey and Kays outline of oral surgery – Part-1; Seward GR & etal
7. Essentials of safe dentistry for the medically compromised patients; Mc Carthy FM
8. Extraction of teeth;Howe, GL
9. Minor Oral Surgery; Howe.GL

17. Prosthodontics, Crown & Bridge

1. Syllabus of Complete denture by – Charles M. Heartwell Jr. and Arthur O. Rahn.

2. Boucher's "Prosthodontic treatment for edentulous patients"
3. Essentials of complete denture prosthodontics by – Sheldon Winkler.
4. Maxillofacial prosthetics by – Willam R.Laney.
5. McCracken's Removable partial prosthodontics
6. Removable partial prosthodontics by – Ernest L. Miller and Joseph E. Grasso.

18. Periodontology

1. Glickman's Clinical Periodontology – Carranza

REFERENCE BOOKS :

1. Essentials of Periodontology and Periodontics – Torquil MacPhee
2. Contemporary Periodontics – Cohen
3. Periodontal therapy – Goldman
4. Orbans' Periodontics – Orban
5. Oral Health Survey – W.H.O.
6. Preventive Periodontics – Young and Stiffler
7. Public Health Dentistry – Slack
8. Advanced Periodontal Disease – John Prichard
9. Preventive Dentistry – Forrest
10. Clinical Periodontology – Jan Lindhe
11. Periodontics – Baer & Morris.

19. Conservative Dentistry and Endodontics

1. Esthetic guidelines for restorative dentistry; Scharer & others
2. Esthetics of anterior fixed prosthodontics; Chiche (GJ) & Pinault (Alain)
3. Esthetic & the treatment of facial form, Vol 28; Mc Namara (JA)

20. Aesthetic Dentistry

1. Aesthetic guidelines for restorative dentistry; Scharer & others
2. Esthetics of anterior fixed prosthodontics; Chiche (GJ) & Pinault (Alain)
3. Aesthetic & the treatment of facial form, Vol 28; Mc Namara (JA)

21. Forensic Odontology

1. Practical Forensic odontology – Derek Clark

22. Oral Implantology

1. Contemporary Implant Dentistry - Carl .E. Misch Mosby 1993 First Edition.
2. Osseointegration and Occlusal Rehabilitation Hobo S., Ichida .E. and Garcia L.T. Quintessence Publishing Company, 1989 First Edition.

23. Behavioural Science

1. General psychology -- Hans Raj, Bhatia
2. Behavioural Sciences in Medical practice -- Manju Mehta

24. Ethics

1. Medical Ethics, Francis C.M., I Ed. 1993, Jaypee Brothers, New Delhi p. 189.

- Note: 1. Books titles will keep on adding in view of the latest advances in the Dental Sciences.
2. Standard Books from Indian Authors are also recommended.

LIST OF JOURNALS:

1. Journal of Dentistry
2. British Dental Journal
3. International Dental Journal
4. Dental Abstracts
5. Journal of American Dental Association
6. British Journal of Oral and Maxillofacial Surgery
7. Oral Surgery, Oral Pathology and Oral Medicine
8. Journal of Periodontology
9. Journal of Endodontics
10. American journal of Orthodontics and Dentofacial Orthopedics
11. Journal of Prosthetic Dentistry
12. Journal of Public Health Dentistry
13. Endodontics and Dental Traumatology
14. Journal of Dental Education
15. Dental Update
16. Journal of Dental Material

- Note : This is the minimum requirement. More journals both Indian and Foreign are recommended for imparting research oriented education.

INFRASTRUCTURE & FUNCTIONAL REQUIREMENTS

50 ADMISSIONS

General Facilities:

1. **Administrative block:** 2000 sq.ft.
consisting of –
 - (a) Dean's room,
 - (b) Administrative officer's room
 - (c) Meeting room
 - (d) Office
 - (e) Office stores
 - (f) Pantry etc.
2. **Library:** 4500 sq.ft.
consisting of –
 - (a) Reception & waiting
 - (b) Property counter
 - (c) Issue counter
 - (d) Photocopying area
 - (e) Reading room to accommodate 50% of total students strength.
 - (f) Postgraduates & staff reading room
 - (g) Journal room
 - (h) Audio-visual room
 - (i) Chief librarian room
 - (j) Stores and stocking area.
3. **Lecture halls – 4 :** 3200 sq.ft.
Each hall to accommodate 10% more of admission strength with proper seating arrangement, blackboard, microphone and facilities for slide, overhead and multi-media projection.
4. **Central stores:** 400 sq.ft.
With proper storing facilities like racks, refrigerator, preferably compact storage systems.
5. **Maintenance room:** 600 sq.ft.
Equipped with proper facilities to maintain and repair dental chairs and units and various other equipments in the college and hospital.
6. **Photography and artist room:** 250 sq.ft.
With proper studio facilities for clinical photography, developing, preparation of slides, charts, models etc.
7. **Medical stores:** 200 sq.ft.
Stocked with all the necessary drugs usually prescribed in a dental hospital.
8. **Aminities area:** 2000 sq.ft.
 - (a) Boys' and Girls' locker rooms
 - (b) Boys' and Girls' common rooms
 - (c) Common room for non-teaching staff
 - (d) Common room for teaching staff
 - (e) Change room for men
 - (f) Change room for women
9. **Compressor and room for gas plant:** 200 sq.ft.
Adequate to accommodate required capacity compressors, gas cylinders etc.
10. **Pollution control measures:**
All the dental institutions shall take adequate pollution control measures by providing incineration plant, sewage water treatment plant, landscaping of the campus etc.
11. **Cafeteria:** 800 sq.ft.
With accommodation for 100 people with kitchen, stores, washing area etc.
12. **Examination hall:** 1800 sq.ft.
A separate hall for university and other examination furnished with chairs and individual tables to accommodate 125 students at a time.
13. **Hostels:**
The hostel accommodation shall be provided based on number of admissions for all the boys and girls in the Dental College campus itself. The accommodation may be increased in a phased manner over a period of 4 years.
14. **Staff quarters:**
All the staff members, teaching and non-teaching working in the institution shall be provided adequate accommodation in the 5 acres land earmarked for the college. The staff quarters may be built in a phased manner over a period of 4 years.

15. Play ground:

There shall be facilities for both indoor and out-door games in the premises.

Against Serial No. 17. Auditorium, the word serial No. 17 has been deleted and substituted by 16, in terms of (1st Amendment) notification published on 7th January,2008 in the Gazette of India.

16.17. Auditorium:

To accommodate at least 400 people consisting of –

Proper seating arrangements, reception counter, green rooms, lobby, fitted with sound system, slide and multimedia presentation facility.

Against Serial No. 18. Laboratories, the word serial No. 18 has been deleted and substituted by 17, in terms of (1st Amendment) notification published on 7th January,2008 in the Gazette of India.

17.18. Laboratories :**I. Dental subjects:**

- (a) Pre-clinical Prosthodontics and dental material lab – 1500 sq.ft.
- (b) Pre-clinical conservative lab – 1300 sq.ft.
- (c) Oral biology and oral pathology lab – 1300 sq.ft.
- (d) Laboratory for orthodontics and pedodontics – 800 sq.ft.

II. Medical subjects: (only for independent dental colleges): 4500 sq.ft.

- (a) Anatomy dissection hall with storage for cadavers, osteology, demonstration room etc. Area– 1500 sq.ft.

The following have been added in terms of (1st Amendment) notification published on 7th January,2008 in the Gazette of India.

- (b) One laboratory for physiology and pathology and microbiology with stores and preparation rooms for individual subjects attached to it. Area–1500 sq.ft. **for each subject**
- (c) Laboratory for biochemistry and pharmacology with store and preparation rooms separately for both subjects. Area–1500 sq.ft. **for each subject**

III. Clinical:

- (a) Prosthodontics-Plaster room
Polymers room
Wax room
Casting laboratory
Ceramic lab 1300 sq.ft.
- (b) Conservative Dentistry – Plaster room
Casting & ceramic laboratories ... 300 sq.ft.
- (c) Oral pathology for histopathology ... 400 sq.ft.
- (d) Haematology and clinical biochemistry: a laboratory for routine blood and biochemical investigation and urine analysis ... 200 sq.ft.

Against Serial No. 16. Distilled Water Plant, the word serial No. 16 has been deleted and substituted by 18, in terms of (1st Amendment) notification published on 7th January,2008 in the Gazette of India.

18. 16-Distilled Water Plant

The following have been added after the substituted Serial No. 18 Distilled Water Plant, in terms of (1st Amendment) notification published on 7th January,2008 in the Gazette of India.

“Note: Minimum built up area of the dental college building other than Hostel and Staff Quarters should not be less than 30,000 sq. ft. in 3rd Year as per DCI Regulations, 2006.”

100 ADMISSIONS**General:**

1. **Administrative block:** 3000 sq.ft.
consisting of –
 - (e) Dean’s room,
 - (f) Administrative officer’s room
 - (g) Meeting room
 - (h) Office

- (i) Office stores
 - (j) Pantry etc.
2. **Library:** 8000 sq.ft.
consisting of –
 - (a) Reception & waitingProperty counter
 - (b) Issue counter
 - (c) Photocopying area
 - (d) Reading room to accommodate 50% of total students strength.
 - (e) Postgraduates & staff reading room
 - (f) Journal room
 - (g) Audio-visual room
 - (h) Chief librarian room
 - (i) Stores and stocking area.
 - (j) E-Consortium provision to be provided in the College Library connected with the National Medical Library.
 3. **Lecture halls – 4 :** 6400 sq.ft.
Each hall to accommodate 10% more of admission strength with proper seating arrangement, blackboard, microphone and facilities for slide, overhead and multi-media projection.
 4. **Central stores:** 800 sq.ft.
With proper storing facilities like racks, refrigerator, preferably compact storage systems.
 5. **Maintenance room:** 1000 sq.ft.
Equipped with proper facilities to maintain and repair dental chairs and units and various other equipments in the college and hospital.
 6. **Photography and artist room:** 400 sq.ft.
With proper studio facilities for clinical photography, developing, preparation of slides, charts, models etc.
 7. **Medical stores:** 300 sq.ft.
Stocked with all the necessary drugs usually prescribed in a dental hospital.
 8. **Aminities area:** 3200 sq.ft.
 - (a) Boys' and Girls' locker rooms
 - (b) Boys' and Girls' common rooms
 - (c) Common room for non-teaching staff
 - (d) Common room for teaching staff
 - (e) Change room for men
 - (f) Change room for women
 9. **Compressor and room for gas plant:** 300 sq.ft.
Adequate to accommodate required capacity compressors, gas cylinders etc.
 10. **Pollution control measures:**
All the dental institutions shall take adequate pollution control measures by providing incernation plant, sewage water treatment plant, landscaping of the campus etc.
 11. **Cafeteria:** 1500 sq.ft.
With accommodation for 100 people with kitchen, stores, washing area etc.
 12. **Examination hall:** 3600 sq.ft.
A separate hall for university and other examination furnished with chairs and individual tables to accommodate 250 students at a time.
 13. **Hostels:**
The hostel accommodation shall be provided based on number of admissions for all the boys and girls in the Dental College campus itself. The accommodation may be increased in a phased manner over a period of 4 years.
 14. **Staff quarters:**
All the staff members, teaching and non-teaching working in the institution shall be provided adequate accommodation in the 5 acres land earmarked for the college. The staff quarters may be built in a phased manner over a period of 4 years.
 15. **Play ground:**
There shall be facilities for both indoor and out-door games in the premises.
 16. **Auditorium:**
To accommodate at least 500 people consisting of –
Proper seating arrangements, reception counter, green rooms, lobby, fitted with sound system, slide and multimedia presentation facility.
 17. **Laboratories:**

I. Dental subjects:

- (a) Pre-clinical Prosthodontics and dental material lab – 3000 sq.ft.
- (b) Pre-clinical conservative lab – 2500 sq.ft.
- (c) Oral biology and oral pathology lab – 2500 sq.ft.
- (d) Laboratory for orthodontics and pedodontics – 1500 sq.ft.

II. Medical subjects: (only for independent dental colleges):7500 sq.ft.

- (a) Anatomy dissection hall with storage for cadavers, osteology, demonstration room etc. Area – 2500 sq.ft.

The following have been added in terms of (1st Amendment) notification published on 7th January,2008 in the Gazette of India.

- (b) One laboratory for physiology and pathology and microbiology with stores and preparation rooms for individual subjects attached to it. Area – 2500 sq.ft. **for each subject**
- (c) Laboratory for biochemistry and pharmacology with store and preparation rooms separately for both subjects – 2500 sq.ft. **for each subject**

III. Clinical:

- (a) Prosthodontics - Plaster room
Polymers room
Wax room
Casting laboratory
Ceramic lab 2500 sq.ft.
- (b) Conservative Dentistry – Plaster room
Casting & ceramic laboratories ... 600 sq.ft.
- (c) Oral pathology for histopathology ... 600 sq.ft.
- (d) Haematology and clinical biochemistry: a laboratory for routine blood and biochemical investigation and urine analysis ... 300 sq.ft.

18. **Distilled Water Plant**

The following have been added after the Serial No. 18. Distilled Water Plant, in terms of (1st Amendment) notification published on 7th January,2008 in the Gazette of India.

“Note: Minimum built up are of the dental college building other than Hostels and Staff Quarters should not be less than 60,000 sq. ft. in 1st Year and 1,00,000 sq. ft. in 3rd Year as per DCI Regulations, 2006.”

TEACHING AIDS:

Audiovisual – Adequate number of overhead projectors, slide projectors shall be provided in the lecture halls and seminar rooms attached to various departments. It is also desirable to have an LCD or DLP projector for multimedia presentations.

Computers – The administrative area, clinics, stores and library shall be provided with computers & printers preferably interconnected for better co-ordination.

General Hospital:

The applicant owns and manages a General Hospital of not less than 100 beds as per DCI (Establishment of New Dental Colleges, Opening of New or Higher Course of Study or Training and Increase of Admission Capacity in Dental Colleges) Regulations, 2006 with necessary infrastructure facilities including teaching pre-clinical, para-clinical and allied medical sciences in the campus of the proposed dental college,

or

The proposed dental college is located in the proximity of a Government Medical College or a Medical College recognised by the Medical Council of India and an undertaking of the said Medical College to the effect that it would facilitate training to the students of the proposed dental college in the subjects of Medicine, Surgery and Allied Medical Sciences has been obtained,

or

Where no Medical College is available in the proximity of the proposed dental college, the proposed dental college gets itself tied up at least for 5 years with a Government General Hospital having a provision of at least 100 beds and located within a radius of 10 K.M. of the proposed dental college and the tie-up is extendable till it has its own 100 bedded hospital in the same premises. In such cases, the applicant shall produce evidence that necessary infrastructure facilities including teaching pre-clinical, para-clinical and allied medical sciences are owned by the proposed dental college itself.

A 100 bedded teaching hospital should have a definite out patient departments, in-patient services and 24 hours emergency and critical care services. It should have a medical programme as under:-

I. MEDICAL PROGRAMME

A) Medical & Allied Disciplines

- General Medicine
- General Surgery
- Obstetrics and Gynaecology
- Orthopaedics
- Critical Medicine
- Emergency Medicine
- Otorhino Laryngology
- Paediatrics
- Pathology
- Anaesthesiology
- Blood Bank & Transfusion
- Community Medicine
- Hospital Administration

B) Nursing, Paramedical, Technical and Allied Services

- Dielities and Therapeutics
- Drugs & Pharmacy
- ECG Technology
- Imaging Technology
- Central Sterile Supply department
- Physiotherapy
- Medical Record Sections

C) Engineering & Allied Services

- Fire protection
- Electrical
- Air conditioning/Central heating
- Medical Gases
- Refrigeration
- Central Workshop
- Ambulance Service
- Water Supply
- Sewage Treatment/Disposal and waste disposal cell

D) Administration and Ancillary Services

- General Administration
- Material Management
- Medical Social Worker
- PRO
- Library
- Security

II. FUNCTIONAL PROGRAMME

A) Site

Site should be within 10 k.m. radius of the teaching block of Dental College – a site with high degree of sensitivity to outside noise should not be present. It should be accessible by transport and building should be well ventilated.

B) Category wise Bed Distribution

(i)	General Ward – Medical including allied specialities	30 beds
(ii)	General Ward – Surgical including allied specialities.	30 beds
(iii)	Private Ward (A/C & Non A/C)	9 beds
(iv)	Maternity Ward	15 beds
(v)	Pediatric Ward	6 beds

The intensive care services for medical/surgical intensive care with bed complement of 4 beds (4% of bed strength).

The critical care services for medical/surgical emergencies with bed complement of 6 beds (6% of bed strength).

III. AREA REQUIREMENTS (AS PER BUREAU OF INDIAN STANDARDS)

- Covered area requirement is 20 sq. m. / bed
- Out of the total covered area
- 40% inpatient services
- 35% outpatient services

- 25% department and supportive services

IV. MAN POWER REQUIREMENTS

The consultants in the various departments should have atleast 8 years teaching experience after post graduation.

MEDICAL STAFF

- General Surgery	-	2
- General Medicine	-	2
- Obstetrics & Gynaecology	-	2
- ENT	-	2
- Paediatrics	-	2
- Anaesthesia	-	2
- Orthopaedics	-	2
- Pharmacologist	-	1
- Radiologist	-	1
- G. DMO	-	1
- Community Medicine	-	1
- Hospital Administration	-	1

NURSING STAFF

- Matron	-	1
- Sister in-charge	-	6
- O. T. Nurses	-	6
- General Nurses	-	20
- Labour Room Nurses	-	4

HEALTH STAFF

- Female Health Assistant	-	1
- Extension Educator	-	1
- Paramedical Staff		
- Lab Technician/Blood Bank Tech.-	-	4
- ECG Technician	-	1
- Pharmacist	-	4
- Sr. Radiographer	-	1
- CSSD	-	2
- Medical Records	-	1

ENGINEERING STAFF

- Civil	-	2
- Mechanical	-	2
- Electrical	-	2
- Engineering aid	-	4

OTHER STAFF

- Drivers	-	2
- Carpenter	-	1
- Cooks	-	2
- Barber	-	1
- Class IV including chowkidars	-	55

ADMINISTRATIVE STAFF

- Office Superintendent	-	1
- Head Clerk	-	1
- Cashier	-	1
- Stenographer	-	1
- U.D.C.	-	2
- L.D.C.	-	4

Satellite Dental Clinics:

All the dental colleges are encouraged to establish atleast one or two satellite centers with all the infrastructural facilities within 50 kms distance to train and expose students in community oral health care programmes.

Dental Hospital:

The following are the clinical departments in a Dental College.

1. Oral Medicine and Radiology
2. Oral Pathology and Oral Microbiology
3. Public Health Dentistry.
4. Paediatric and Preventive Dentistry
5. Orthodontics & Dental orthopaedics
6. Periodontology
7. Conservative Dentistry and Endodontics.

8. Oral & Maxillofacial Surgery.
9. Prosthodontics and Crown & Bridge

Out patients:

Since dentistry being more clinical oriented speciality, the Council desires that all the institutions make efforts to have adequate clinical material for satisfactory training of undergraduate students. There shall be atleast 75 to 100 new patients on an average each day in colleges with 50 admissions and 100 – 150 new patients in colleges with 100 admissions.

Each of the clinical departments should have the following functional areas –

50 ADMISSIONS:

- (a) Reception and waiting room – 200 sq.ft.
- (b) Undergraduate clinic adequate to accommodate the prescribed number of dental chairs and units.
- (c) Sterilization room where central sterilization facilities are not provided – 150 sq.ft.
- (d) Small department stores – 100 sq.ft.
- (e) Seminar room – 200 sq.ft.

Staff rooms :

1. H.O.Ds room - 180 sq.ft.
2. Readers' room - 150 sq.ft.
3. Lecturers' room - 250 sq.ft.

Note: Departments having postgraduate training should provide additional functional requirements as per MDS regulations.

Main reception and dental records section: 800 sq.ft.

100 ADMISSIONS:

- (a) Reception and waiting room – 300 sq.ft.
- (b) Undergraduate clinic adequate to accommodate the prescribed number of dental chairs and units.
- (c) Sterilization room where central sterilization facilities are not provided – 200 sq.ft.
- (d) Small department stores – 100 sq.ft.
- (e) Seminar room – 400 sq.ft.

Staff rooms:

1. H.O.Ds room - 180 sq.ft.
2. Readers' room - 150 sq.ft.
3. Lecturers' room - 300 sq.ft.

Note: Departments having postgraduate training should provide additional functional requirements as per MDS regulations.

Main reception and dental records section: 1500 sq.ft.

There should be adequate area for patients reception, waiting, registration, storage of patients records etc.

Requirement of dental chairs and units:

For 50 admissions - 100
For 100 admissions - 200

Note: Requirement of Dental Chairs for 1st and 2nd BDS will be as per DCI (Establishment of New Dental Colleges, Opening of New or Higher Course of Study or Training and Increase of Admission Capacity in Dental Colleges) Regulations, 2006.

Distribution of dental chairs and units in various departments (Specification is mentioned in the DCI Regulations 2006):

Department	50 admissions	100 admissions
Oral Medicine & Radiology	06	12
Oral Pathology & Oral Microbiology	01	02
Public Health Dentistry	08	16
Paediatrics and Preventive Dentistry	10	20
Orthodontics	09	18
Periodontology	17	34
Conservative Dentistry and Endodontics	17	34
Oral & Maxillofacial Surgery	15	30
Prosthodontics and Crown & Bridge	17	34
	-----	-----
	100	200
Total approximate area for U.G. clinics (50 admissions) -		12,500 sq.ft.
Total approximate area for U.G. clinics (100 admissions) -		25,000 sq.ft.

EQUIPMENT REQUIREMENTS**Department : ORAL MEDICINE AND RADIOLOGY**

NAME	SPECIFICATION	QUANTITY	
		50 Admns.	100 Admns.
	(Space allocation for each Dental chair 100 Sq Ft in all the Departments)		
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, Air Ventury Suction, X-Ray viewer, 3 way syringe, instrument tray, Dental Operator's Stool with height adjustment.	6	12
Panoramic X-Ray with Cephalometric	Preferably digital	1	1
Intra Oral X-ray Unit	70 KV , 8mA, high frequency preferably Digital timer	2	3
Pulp testers	Digital	2	3
Automatic periapical X-ray Developer		1	1
Automatic Panoramic with Cephalometric X-ray Developer		1	1
X-ray viewer	For Panoramic and Cephalometric films	2	2
Radiovisiography	Digital Intra X-ray System with one Sensor and Software	1	1
General X-ray Unit		1	1
Ortho Pantmograph	preferably digital	1	1
Automatic Developers/ <i>Dark Room</i>		1	2
Lead aprons		2	2
Lead Gloves		1	1
X-ray Hangers		6	6
X-ray viewers		2	2
Diagnostic Kits	Mouth mirror, dental probe, college tweezers	20	40
<i>Lead Screen</i>		1	1
<i>Biopsy Kit</i>		1	1
Autoclave	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters	1	2
Computers	Minimum Pentium -IV	1	1
Intra Oral Camera	With High resolution	1	1
Needle Burner with Syringe Cutter		2	2

Department : ORAL PATHOLOGY AND ORAL MICROBIOLOGY

NAME	SPECIFICATION	QUANTITY	
		50 Admns.	100 Admns.
Dental Chairs and Units	With shadowless lamp, spittoon, 3 way syringe, instrument tray and suction	1	2
Microscopes		20	40
Microtome		1	1
Wax bath		1	1
Water bath		1	1
Knife sharpner		1	1
Hot plate		1	1
Spencer knife		1	1

Department : PUBLIC HEALTH DENTISTRY

NAME	SPECIFICATION	QUANTITY	
		50 Admns.	100 Admns.
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, Air ventury suction, micromotor control light cure 3 way syringe, X-ray viewer, instrument tray Dental Operators stool with height adjustment With shadowless lamp, spittoon, 3 way	8	16

	syringe, instrument tray and suction, micromotor, airtor, light cure		
Autoclaves	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters.	1	2
Ultrasonic cleaner	Minimum capacity 13 liters with mesh bucket with digital timer	1	2
Needle burner with syringe cutter		2	4
MOBILE CLINIC			
Mobile dental van	Mobile dental van with two dental chairs with all the attachments and adequate sitting space for 15 to 20 people		
Dental chair with unit	Hydraulically operated with spittoon attachment, halogen light with 2 intensity, air ventury suction, airtor, micromotor, 3 way-scaler and light cure, x-ray viewer, instrument tray, operating stool.	2	
Autoclaves	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters.	1	1
Intraoral x-ray	Portable, 70 KV, 8mA	1	1
Glass bead sterilizers		1	1
Compressor	1.25HP	1	1
Metal Cabinet	With wash basin	1	1
Portable dental chair	Suitcase unit with airtor, micromotor, scaler and compressor 0.25HP	2	2
Stabilizer	4KV	1	1
Generator	4KV	1	1
Water tank	400ltrs	1	1
Oxygen cylinder		1	1
Public address system		1	1
TV and video cassette player		1	1
Demonstration models			

Department : PAEDIATRIC AND PREVENTIVE DENTISTRY

NAME	SPECIFICATION	QUANTITY	
		50 Admns.	100 Admns.
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, high power motorized evacuation system, Air rotor with miniature, Airtor HPS, Micro motor with miniature contrangle Hand piece, 3 way syringe, ultrasonic sealer with 3 tips, Light cure unit LED based heat free, X-ray viewer, instrument tray Dental Operator's stool with height adjustment (Pedo chair preferred)	10	20
Autoclaves	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters.	1	2
Ultrasonic cleaner	Minimum capacity 13 liters with mesh bucket with digital timer	1	2
Needle Burner with syringe cutter		2	3
Amalgamator		1	1
Pulp Tester-Digital		1	1
Rubber dam kit for pedo		3	5
Apex locator		1	1
Endo motor	With torque control HPs	1	1
Injectable gutta percha with condensation		1	1
Radiovisiography	Digital intra X-ray system with pedo sensor and software	1	1
Intra Oral Camera	With high resolution	1	1
Scaling instruments		5	10
Restorative instruments		5	10
Extraction forceps		5	10
Intra-oral X-ray		1	1
Automatic Developer		1	1
Computer	Minimum Pentium IV	1	1
PEDO LAB			

Plaster dispenser	One each for plaster and stone plaster	2	2
Model Trimmer	With diamond disc	1	1
Model Trimer	Double disc one diamond and one carborandum disc	1	1
Welder with soldering attachments		1	1
Vibrator		2	2
Lab micro motor	Heavy duty with Hps	2	3
Dental Lathe		1	1
Model Trimmer		1	1
Steam cleaner		1	1
Pressure moulding machine		1	1
Carborandum Disc		1	1
Diamond disc		1	1

Department : ORTHODONTICS

NAME	SPECIFICATION	QUANTITY	
		50 Admns.	100 Admns.
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, Air ventury suction, micromotor control light cure 3 way syringe, X-ray viewer, instrument tray Dental Operators stool with height adjustment	9	18
Unit mount scaler		3	5
Autoclave	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters	1	2
Ultrasonic Cleaner	Minimum capacity 13 liters with mesh bucket with digital timer	1	2
ORTHO LAB			
Plaster dispenser	One each for plaster and stone plaster	2	2
Vibrator		2	2
Model Trimmer		1	2
Micromotor -	heavy duty	2	4
Lathe		1	2
X-ray viewers		2	2
OPG with cephalostat	If available in radiology its is adequate.	1	1
Welders		2	4
Blue Torch		1	1
Base Formers		2	4
Typodont		2	4
Set of Pliers		5	10
Welder with soldering attachments		1	1
Hydro solder		1	1
Typhodont articulator	With metal teeth wax rim of Class I, II, III	3	4
Pressure moulding machine		1	1

Department : PERIODONTOLOGY

NAME	SPECIFICATION	QUANTITY	
		50 Admns.	100 Admns.
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, high power evacuation system, Air ventury suction, X-ray viewer, Airrotor, Micromotor with straight and contrangle Handpiece, With shadowless lamp, spittoon, 3 way syringe, ultrasonic sealer with 3 tips, X-ray viewer, instrument tray dental operator's stool with height adjustment	17	34
	Note: Atleast 25% of the units should have the Airpolisher.		
Scaling instrument sets		5	10
Surgical instrument sets		3	6
Autoclave	Having wet and dry cycle, which can achieve	2	3

	135°C with minimum capacity of 20 liters		
Ultrasonic scaler	Minimum capacity 13 liters with mesh bucket	1	2
Electro surgical cautery		1	1
Needle burner with syringe cutter		4	6
LASER	Soft tissue laser	1	1
Surgical motor with physio dispenser		1	1

Department : CONSERVATIVE DENTISTRY AND ENDODONTICS

NAME	SPECIFICATION	QUANTITY	
		50 Adms.	100 Adms.
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, high power evacuation system, Air ventury suction, X-ray viewer, Airrotor, Micromotor with straight and contrangle Handpiece, With shadowless lamp, spittoon, 3 way syringe, ultrasonic sealer with 3 tips, X-ray viewer, instrument tray dental operator's stool with height adjustment	17	34
Rubber dam kits		4	6
Restorative instruments kits		5	10
R.C.T. instrument kits		5	10
Autoclaves	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters	2	3
Ultrasonic cleaner	Minimum capacity 13 liters with mesh bucket	1	2
Needle burner with syringe cutter		3	4
Amalgamator	With auto proportion, auto dispenser	2	3
Rubber dam kits		4	6
Pulp Tester-Digital		2	4
Apex Locator		1	2
Glass bead sterilizers		4	6
Plaster dispensers		2	2
Vibrator		1	2
Ceramic Unit		1	1
Casting machine		1	1
Intra-oral X-ray Unit	Proper radiation safety	1	1
Automatic Developer		1	1
Radiovisiography	RVG with Computer	1	1
Endo motor	With torque control Hps	1	1
Bleaching unit		1	1
Magnification loops		1	2
Injectable gutta percha		1	2
PHANTOM LAB UNIT	Phantom Table fitted with Halogen Operating Light Phantom Head body type neck joint for all the movement, TMJ movement. Modular with Air rotor, Micro motor with contra angle Hps, 3-way syringe, jaw with ivorine teeth, preferably soft gingival, dental operator's stool (not to use extracted or cadaver teeth).	30	60

CHEMICAL LABORATORY

Plaster Dispenser	One each for plaster and stone plaster	2	2
Model Trimmer	Carborandum disc	1	1
	Diamond disc	1	1
Lathe	Heavy Duty	1	2
Lab Micromotor	With heavy duty handpiece	2	3
Ultrasonic cleaner	Minimum capacity 5 liters	1	1
Spindle Grinder		1	1
Vibrator		1	2
Burnout furnace		1	1
Porcelain furnace		1	1

Sandblasting Machine		1	1
Lab Airrotor		1	1
Pindex System		1	1
Circular saw		1	1
Vacuum mixer		1	1
Pneumatic chisel		1	1
Casting machine	Motor cast/induction casting preferred	1	1

Department : ORAL & MAXILLOFACIAL SURGERY**A) EXODONTIA**

NAME	SPECIFICATION	QUANTITY	
		50 Adms.	100 Adms.
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, Air ventury suction, X-ray viewer, 3 way syringe, instrument tray Dental Operator's stool and height adjustment and suction, Micromotor/ Airotor	15	30
Autoclaves	Front loading Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters	2	2
Ultrasonic Cleaner	Minimum capacity 13 liters with mesh bucket	1	2
Needle burner with syringe cutter		4	6
Extraction forceps sets	Complete set	10	20
Dental elevators	Complete set	5	10
Minor Oral surgery kits		3	6
Emergency drugs tray		1	1
Oxygen cylinder with mask		1	1
X-ray viewers		2	2
Computer	Minimum Pentium IV	1	1

B) MINOR SURGERY

Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, high power evacuation system, Air ventury suction, X-ray viewer, Airrotor, Micromotor with straight and contrangle Handpiece, 3 way syringe, instrument tray Dental Operator's stool and height adjustment and suction,	3	5
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Department : PROSTHODONTICS AND CROWN & BRIDGE

NAME	SPECIFICATION	QUANTITY	
		50 Adms.	100 Adms.
Dental Chairs and Units	Electrically operated, Spittoon attachment, Halogen Light with 2 intensity, high power evacuation system, Air ventury suction, X-ray viewer, Airrotor, Micromotor with straight and contrangle Handpiece, 3 way syringe, ultrasonic sealer with 3 tips, Light cure unit, instrument tray and suction, Dental operator stool with height adjustment Electrically operated, Spittoon attachment, Halogen Light with 2 intensity , Air ventury suction, instrument tray, Dental operator stool with height adjustment	17	34
Semi adjustable articulator	With face bow	2	2
Extra oral/intra oral tracer		2	2
Dewaxing unit		1	2
Curing unit		1	2
Dental casting machine		1	1
Wax burnout furnace		1	1
Pre heating furnace		1	1
Surveying unit		1	2
Heavy duty hand piece	Lab micromotors	3	4

Autoclave	Having wet and dry cycle, which can achieve 135°C with minimum capacity of 20 liters	1	2
Needle burner with syringe cutter		1	2
Plaster Dispenser	One each for plaster and stone plaster	2	2
Model Trimmer with Carborandum Disc		1	1
Model Trimmer with Diamond Disc		1	2
Acrylizer		2	3
Lathe		1	2
Flask press		4	4
Deflasking unit		4	4
Dewaxing unit		2	3
Hydraulic Press		2	3
Mechanical Press		1	2
Vacuum mixing machine		1	1
Lab Micro motor	With heavy duty handpiece	3	4
Curing pressure pot		1	1
Porcelain furnace		1	2
Vibrator		1	2
Sand blasting unit		2	2
Ultrasonic cleaner		1	2
Model Trimmer		2	4
Hot water sterilizer		1	2
Geyser	Compound bath	1	2
H.P. grinder with suction		2	3
Heavy duty lathe		2	2
Phantom heads		50	50
Pre-clinical working tables	Gas connection & bunsen burner	50	100

CERAMIC AND CAST PARTIAL LABORATORY

NAME	SPECIFICATIONS	50 ADMN	100 ADMN
Plaster Dispensor	One each for plaster and stone plaster	2	2
Duplicator		1	1
Pindex System		1	1
Circular saw		1	1
Burn out furnace		1	1
Sandblasting machine	With two containers	1	1
Electro-polisher		1	1
Model Trimmer with Carborandum disc		1	1
Model Trimmer with Diamond disc		1	1
Induction casting machine		1	1
Programmable porcelain furnace with vacuum pump with instrument kit and material kit		1	1
Spot welder with soldering, attachment of cable		1	1
Vacuum mixing machine		1	1
Steam Cleaner		1	1
Spindle Grinder 24,000 RPM with vacuum suction		1	1
Wax heater		1	1
Wax carver		1	1
Curing pressure pot		1	1
Milling machine		1	1
Heavy duty lathe with suction		1	1
Preheating furnace		1	1
Palatal trimmer		1	1
Ultrasonic cleaner	5 liters capacity	1	1
Composite curing unit		1	1
Micro surveyor		1	1
PRE-CLINICAL PROSTHETICS LABORATORY	Work table preferably complete stainless steel fitted with light, Bunsen burner, air	30	60

	blower, working stool. Adequate number of lab micro motor with attached hand piece	10	20
PLASTER ROOM FOR PRE-CLINICAL WORK			
Plaster dispenser	One each for plaster and stone plaster	2	2
Vibrator		2	2
Lathe		2	2
Model Trimmer		1	1
Carborandum Disc		1	1
Diamond disc		1	1

MINIMUM BASIC QUALIFICATION AND TEACHING EXPERIENCE REQUIRED FOR TEACHERS FOR UNDER-GRADUATE DENTAL STUDIES.

(A) Dental Staff

Principal/Dean: Same qualifications as prescribed for a Professor. Experience as Professor for not less than 5 years in a Dental Institution.

Professors: A BDS Degree of an Indian University or an equivalent qualification with Post-graduate qualification /Diplomate of National Board in the subject and with 5 years teaching experience as Reader.

Readers: A BDS Degree of an Indian University or an equivalent qualification with Post-graduate qualification /Diplomate of National Board in the subject and with 4 year's teaching experience after post-graduation.

Lecturers: A recognised MDS Degree of an Indian University/Diplomate of National Board or an equivalent qualification.

Tutors A recognised BDS Degree of Indian University or an equivalent qualification with at least one year experience.

Note:

In case of individuals with discrepancy between teaching experience and the post-graduate qualification, a reference may be made to the Dental Council of India through competent authority for consideration. This is not applicable for future entrants.

(B) Medical Staff

The requirement of medical teaching staff is to be as per DCI Regulations 2006

Qualification and Teaching Experience of the medical teaching staff will be as per MCI Regulations.

MINIMUM STAFFING PATTERN FOR UNDER GRADUATE DENTAL STUDIES FOR 50 ADMISSIONS
(As per DCI Regulations 2006)

Principal/Dean: - **1 (One post of Professor can be deleted in the under mentioned tabulation according to the subject of specialisation)**

Each Dental Department should be headed by a Professor.

	I Year			II Year			III Year			Total Posts in position from the beginning of 3 rd year onwards		
	Prof.	Reader	Lecturer/ Tutor	Prof.	Reader	Lecturer/ Tutor	Prof.	Reader	Lecturer/ Tutor	Prof.	Reader	Lecturer/ Tutor
	2*	2	10	3*	4	20	6*	11	30	6	11	30#
Prosthodontics and Crown & Bridge	1	1	-	1	2	-	1	2	-	1	2	-
Oral Pathology and Oral Microbiology	-	-	-	-	1	-	1	1	-	1	1	-
Conservative Dentistry and Endodontics	-	1	-	1	1	-	1	2	-	1	2	-
Oral & Maxillofacial Surgery	-	-	-	-	-	-	1	1	-	1	1	-
Periodontology	-	-	-	-	-	-	1	1	-	1	1	-
Orthodontics	-	-	-	-	-	-	1	1	-	1	1	-
Paediatric & Preventive Dentistry	-	-	-	-	-	-	-	1	-	-	1	-
Oral Medicine & Radiology	-	-	-	-	-	-	-	1	-	-	1	-
Public Health Dentistry	-	-	-	-	-	-	-	1	-	-	1	-
Dental Materials	-	-	-	-	-	-	-	-	-	-	-	-
Dental Anatomy, Embryology & Oral Histology	-	-	-	-	-	-	-	-	-	-	-	-

* Includes the Principal who can head any one of the six specialities.

25% MDS and 75% BDS.

MINIMUM STAFFING PATTERN FOR UNDER GRADUATE DENTAL STUDIES FOR 100 ADMISSIONS
(As per DCI Regulations 2006)

Each Dental Department should be headed by a Professor

	I Year			II Year			III Year			Total Posts in position from the beginning of 3 rd year onwards		
	Prof.	Reader	Lecturer/ Tutor	Prof.	Reader	Lecturer/ Tutor	Prof.	Reader	Lecturer/ Tutor	Prof.	Reader	Lecturer/ Tutor
	2*	3	16	4*	5	30	6*	13	40	6*	13	40#
Prosthodontics and Crown & Bridge	1	2	-	1	2	-	1	2	-	1	2	-
Oral Pathology and Oral Microbiology	-	-	-	1	1	-	1	1	-	1	1	-
Conservative Dentistry and Endodontics	-	1	-	1	2	-	1	2	-	1	2	-
Oral & Maxillofacial Surgery	-	-	-	-	-	-	1	2	-	1	2	-

Periodontology	-	-	-	-	-	-	1	2	-	1	2	-
Orthodontics	-	-	-	-	-	-	1	1	-	1	1	-
Paediatric & Preventive Dentistry	-	-	-	-	-	-	-	1	-	-	1	-
Oral Medicine & Radiology	-	-	-	-	-	-	-	1	-	-	1	-
Public Health Dentistry	-	-	-	-	-	-	-	1	-	-	1	-
Dental Materials	-	-	-	-	-	-	-	-	-	-	-	-
Dental Anatomy, Embryology & Oral Histology	-	-	-	-	-	-	-	-	-	-	-	-

* Includes the Principal who can head any one of the six specialities.

25% MDS and 75% BDS.

**Medical Teaching Staff in a Dental College
(As per DCI Regulations 2006)**

Year	Subjects	Intake and Designation					
		50 Admissions			100 Admissions		
		Prof	Reader	Lecturer	Prof	Reader	Lecturer
I	Anatomy	-	1	2	-	1	4
I	Physiology	-	1	2	-	1	2
I	Biochemistry	-	1	2	-	1	2
II	Pharmacology	-	1	2	-	1	3
II	General Pathology	-	1	2	-	1	2
II	Microbiology	-	1	2	-	1	2
III	General Medicine	-	1	2	-	1	3
III	General Surgery	-	1	2	-	1	3
III	Anaesthesia	-	1	1	-	1	1

OTHER STAFF PATTERN FOR 50 ADMISSIONS

Administrative Officer 1
Secretary to Dean 1
Public Relation officer 1

Designation	Receptionist	Establishment	Accounts	Admissions	Exams	Stores	Library	Maintenance	Security	Illustration	Clinical Depts.	Computer	Laboratories	Sports	Total
Managers/ Office Suptd.		1	1						1			1			4
Assistants		1	1	1	1	1	2	1							8
Receptionist	8														8
Librarian							1								1
D.S.A.(Chair side Attendant)											10				10
Dent. Tech. (Dental Mechanic)											6				6
Dent. Hygst.											3				3
Radiographer											2				2
Photographer										1					1
Artist										1					1
Programmer												1			1
Data Entry Operators												1			1
Physical Director														1	1
Engineer								1							1
Electricians								2							2
Plumber								1							1
Carpenter								1							1
Mason								1							1
A.C. Tech.								1							1
Helpers Electrical								1							1
Sweepers & Scavengers							2	2			3		3		10
Attenders	2	1	1		1	1	1	2			4	1	4		18
Security Personal									5						5
Dept. Secretaries											4				4
Driver									4						4
Nurses											3				3
Lab. Technicians													3		3

Note:

The above staff pattern indicates minimum requirements for the stipulated admissions. However, the actual staff requirements may marginally vary depending upon the patients' flow, work culture and design of the building.

OTHER STAFF PATTERN FOR 100 ADMISSIONS

Administrative Officer 1
Secretary to Dean 1
Public Relation officer 1

Designation	Receptionist	Establishment	Accounts	Admissions	Exams	Stores	Library	Maintenance	Security	Illustration	Clinical Depts.	Computer	Laboratories	Sports	Total
Managers / Office Supdt.	1	1	1		1	1			1			1			7
Assistants		2	2	2	1	1	4	1							13
Receptionist	14														14
Librarian							1								1
D.S.A.(Chair side Attendant)											20				20
Dent. Tech.(Dental											10				10

Mechanic)														
Dent. Hygst.										5				5
Radiographer										3				3
Photographer									1					1
Artist									1					1
Programmer											1			1
Data Entry Operators											2			2
Physical Director													1	1
Engineer							1							1
Electricians							4							4
Plumber							2							2
Carpenter							1							1
Mason							1							1
A.C. Tech.							1							1
Helpers Electrical							3							3
Sweepers & Scavangers						2	4			5		6		17
Attenders	3	1	1		1	2	2	3		5	1	6		25
Security Personal									6					6
Dept. Secretaries										8				8
Driver									5					5
Nurses										9				9
Lab. Technicians												5		5

Note:

The above staff pattern indicates minimum requirements for the stipulated admissions. However, the actual staff requirements may marginally vary depending upon the patients' flow, work culture and design of the building.

SYLLABUS OF STUDY**1. HUMAN ANATOMY, EMBRYOLOGY, HISTOLOGY & MEDICAL GENETICS****A) GOAL**

The students should gain the knowledge and insight into, the functional anatomy of the normal human head and neck, functional histology and an appreciation of the genetic basis of inheritance and disease, and the embryological development of clinically important structures. So that relevant anatomical & scientific foundations are laid down for the clinical years of the BDS course.

B) OBJECTIVES :

a) KNOWLEDGE & UNDERSTANDING:

At the end of the 1st year BDS course in Anatomical Sciences the undergraduate student is Expected to:

1. Know the normal disposition of the structures in the body while clinically examining a patient and while conducting clinical procedures.
2. Know the anatomical basis of disease and injury.
3. Know the microscopic structure of the various tissues, a pre-requisite for understanding of the disease processes.
4. Know the nervous system to locate the site of lesions according to the sensory and or motor deficits encountered.
5. Have an idea about the basis of abnormal development, critical stages of development, effects of teratogens, genetic mutations and environmental hazards.
6. Know the sectional anatomy of head neck and brain to read the features in radiographs and pictures taken by modern imaging techniques.
7. Know the anatomy of cardio-pulmonary resuscitation.

b) SKILLS

1. To locate various structures of the body and to mark the topography of the living anatomy.
2. To identify various tissues under microscope.
3. To identify the features in radiographs and modern imaging techniques.
4. To detect various congenital abnormalities.

C) INTEGRATION

By emphasising on the relevant information and avoiding unwanted details, the anatomy taught integrally with other basic sciences & clinical subjects not only keeps the curiosity alive in the learner but also lays down the scientific foundation for making a better doctor, a benefit to the society.

This insight is gained in a variety of ways:

- 1) Lectures & small group teaching
- 2) Demonstrations
- 3) Dissection of the human cadaver
- 4) Study of dissected specimens

- 5) Osteology
- 6) Surface anatomy on living individual
- 7) Study of radiographs & other modern imaging techniques.
- 8) Study of Histology slides.
- 9) Study of embryology models
- 10) Audio-visual aids

Throughout the course, particular emphasis is placed on the functional correlation, clinical application & on integration with teaching in other bio dental disciplines.

D) AN OUTLINE OF THE COURSE CONTENT:

1. General anatomy: Introduction of anatomical terms and brief outline of various systems of the body.
2. Regional anatomy of head & neck with osteology of bones of head & neck, with emphasis on topics of dental importance.
3. General disposition of thoracic, abdominal & pelvic organs.
4. The regional anatomy of the sites of intramuscular & intra vascular injections, & lumbar puncture.
5. General embryology & systemic embryology with respect to development of head & neck.
6. Histology of basic tissues and of the organs of gastrointestinal, respiratory, Endocrine, excretory systems & gonads.
7. Medical genetics.

E) FURTHER DETAILS OF THE COURSE.

I. INTRODUCTION TO :

1. Anatomical terms.
2. Skin, superficial fascia & deep fascia
3. Cardiovascular system, portal system collateral circulation and arteries.
4. Lymphatic system, regional lymph nodes
5. Osteology - Including ossification & growth of bones
6. Myology – Including types of muscle tissue & innervation.
7. Syndesmology – Including classification of Joints.
8. Nervous system

II. HEAD & NECK:

01. Scalp, face & temple, lacrimal apparatus 02. Neck - Deep fascia of neck, posterior triangle, suboccipital triangle, anterior triangle, anterior median region of the neck, deep structures in the neck. 03. Cranial cavity - Meninges, parts of brain, ventricles of brain, dural venous sinuses, cranial nerves attached to the brain, pituitary gland. 04. Cranial nerves - III, IV, V, VI, VII, IX, XII in detail. 05. Orbital cavity – Muscles of the eye ball, supports of the eye ball, nerves and vessels in the orbit. 06. Parotid gland. 07. Temporo mandibular joint, muscles of mastication, infratemporal fossa, pterygo - palatine fossa. 08. Submandibular region 09. Walls of the nasal cavity, paranasal air sinuses 10. Palate 11. Oral cavity, Tongue 12. Pharynx (palatine tonsil and the auditory tube) Larynx. OSTEOLOGY – Foetal skull, adult skull, individual bones of the skull, hyoid bone and cervical vertebrae

III. THORAX : Demonstration on a dissected specimen of

1. Thoracic wall
2. Heart chambers
3. Coronary arteries
4. Pericardium
5. Lungs – surfaces ; pleural cavity
6. Diaphragm

IV. ABDOMEN : Demonstration on a dissected specimen of

1. Peritoneal cavity
2. Organs in the abdominal & pelvic cavity.

V. CLINICAL PROCEDURES :

- a) Intramuscular injections: Demonstration on a dissected specimen and on a living person of the following sites of injection.
 1. Deltoid muscle and its relation to the axillary nerve and radial nerve.
 2. Gluteal region and the relation of the sciatic nerve.
 3. Vastus lateralis muscle.
- b) Intravenous injections & venesection: Demonstration of veins in the dissected specimen and on a living person.
 1. Median cubital vein
 2. Cephalic vein
 3. Basilic vein
 4. Long saphenous vein
- c) Arterial pulsations: Demonstration of arteries on a dissected specimen and feeling of pulsation of the following arteries on a living person.
 1. Superficial temporal
 2. Facial
 3. Carotid
 4. Axillary
 5. Brachial
 6. Radial
 7. Ulnar
 8. Femoral
 9. Popliteal
 10. Dorsalispedis

- d) Lumbar puncture: Demonstration on a dissected specimen of the spinal cord, cauda equina & epidural space and the inter vertebral space between L4 & L5 .

VI. EMBRYOLOGY :

Oogenesis, Spermatogenesis, Fertilisation, Placenta, Primitive streak, Neural crest, Bilaminar and trilaminar embryonic disc, Intra embryonic mesoderm - formation and fate, notochord formation & fate, Pharyngeal arches, pouches & clefts, Development of face, tongue, palate, thyroid gland, pituitary gland, salivary glands, and anomalies in their development, Tooth development in brief.

VII. HISTOLOGY :

The Cell :

Basic tissues - Epithelium, Connective tissue including cartilage and bone, Muscle Tissue, Nervous tissue : Peripheral nerve, optic nerve, sensory ganglion, motor ganglion, Skin

Classification of Glands

Salivary glands (serous, mucous and mixed gland), Blood vessels, Lymphoid tissue Tooth, lip, tongue, hard palate, oesophagus, stomach, duodenum, ileum, colon, vermiform appendix Liver, Pancreas, Lung, Trachea, Epiglottis, Thyroid gland, para thyroid gland, supra renal gland and pituitary gland, Kidney, Ureter, Urinary bladder, Ovary and testis.

VIII. MEDICAL GENETICS :

Mitosis, meiosis, Chromosomes, gene structure, Mendelism, modes of inheritance

RECOMMENDED BOOKS:

1. SNELL (Richard S.) Clinical Anatomy for Medical Students, Ed. 5, Little Brown & company, Boston.
2. RJ LAST'S Anatomy – McMinn, 9th edition.
3. ROMANES(G.J.) Cunningham Manual of Practical Anatomy : Head & Neck & Brain Ed.15.Vol.III, Oxford Medical publication.
4. WHEATER,BURKITT & DANIELS, Functional Histology, Ed. 2, Churchill Livingstone.
5. SADLER, LANGMAN'S, Medical Embryology, Ed. 6.
6. JAMES E ANDERSON, Grant's Atlas of Anatomy. Williams & Wilkins.
7. WILLIAMS, Gray's Anatomy, Ed.38. ,Churchill Livingstone.
8. EMERY,Medical Genetics.

2. HUMAN PHYSIOLOGY

A) GOAL

The broad goal of the teaching undergraduate students in Human Physiology aims at providing the student comprehensive knowledge of the normal functions of the organ systems of the body to facilitate an understanding of the physiological basis of health and disease.

OBJECTIVES

a) KNOWLEDGE

At the end of the course, the student will be able to:

1. Explain the normal functioning of all the organ systems and their interactions for well co-ordinated total body function.
2. Assess the relative contribution of each organ system towards the maintenance of the milieu interior.
3. List the physiological principles underlying the pathogenesis and treatment of disease.

b) SKILLS

At the end of the course, the student shall be able to :

1. Conduct experiments designed for the study of physiological phenomena.
2. Interpret experimental and investigative data
3. Distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

c) INTEGRATION

At the end of the integrated teaching the student shall acquire an integrated knowledge of organ structure and function and its regulatory mechanisms.

B) COURSE CONTENTS THEORY

1. GENERAL PHYSIOLOGY

1. Homeostasis: Basic concept, Feed back mechanisms
2. Structure of cell membrane, transport across cell membrane
3. Membrane potentials

2. BLOOD:

Composition & functions of blood.

Specific gravity, Packed cell volume, factors affecting & methods of determination.

Plasma proteins - Types, concentration, functions & variations.

Erythrocyte - Morphology, functions & variations. Erythropoiesis & factors affecting erythropoiesis.

ESR- Methods of estimation, factors affecting, variations & significance.

Haemoglobin - Normal concentration, method of determination & variation in concentration.

Blood Indices - MCV, MCH, MCHC - definition, normal values, variation.

Anaemia - Definition, classification, life span of RBC's destruction of RBC's , formation & fate of bile pigments, Jaundice - types.

Leucocytes : Classification, number, percentage, distribution morphology, properties, functions & variation. Role of lymphocytes in immunity , leucopoiesis life span & fate of leucocytes.

Thrombocytes - Morphology, , number, variations, function & thrombopoiesis.

Haemostasis - Role of vasoconstriction, platelet plug formation in haemostasis, coagulation factors, intrinsic & extrinsic pathways of coagulation, clot retraction.

Tests of haemostatic function, platelet count, clotting time, bleeding time, prothrombin time - normal values, method & variations. Anticoagulants - mechanism of action. Bleeding disorders.

Blood groups: ABO & Rh system, method of determination, importance, indications & dangers of blood transfusion, blood substitutes.

Blood volume: Normal values, variations.

Body fluids : distribution of total body water, intracellular & extracellular compartments, major anions & cations in intra and extra cellular fluid.

Tissue fluids & lymph : Formation of tissue fluid, composition, circulation & functions of lymph. Oedema - causes.

Functions of reticulo endothelial system.

3. MUSCLE AND NERVE

Classification of nerves, structure of skeletal muscle - Molecular mechanism of muscle contraction, neuromuscular transmission. Properties of skeletal muscle. Structure and properties of cardiac muscle & smooth muscle.

4. DIGESTIVE SYSTEM :

Introduction to digestion : General structure of G.I. tract, Innervation.

Salivary glands: Structure of salivary glands, composition , regulation of secretion & functions of saliva.

Stomach: Composition and functions of gastric juice, mechanism and regulation of gastric secretion.

Exocrine Pancreas - Structure, composition of pancreatic juice, functions of each component, regulation of pancreatic secretion.

Liver : structure , composition of bile, functions of bile, regulation of secretion –

Gall bladder : structure, functions.

Small intestine - Composition, functions & regulation of secretion of intestinal juice.

Large intestine - Functions.

Motor functions of GIT: Mastication, deglutition, gastric filling & emptying, movements of small and large intestine, defecation.

5. EXCRETORY SYSTEM :

Structure & functions of kidney, functional unit of kidney & functions of different parts.

Juxta glomerular apparatus, renal blood flow.

Formation of Urine : Glomerular filtration rate - definition, determination , normal values, factors influencing G.F.R. Tubular reabsorption - Reabsorption of sodium, glucose, water & other substances.

Tubular secretion - secretion of urea, hydrogen and other substances.

Mechanism of concentration & dilution of urine.

Role of kidney in the regulation of pH of the blood.

Micturition : anatomy & innervation of Urinary bladder, mechanism of micturition & abnormalities.

6. BODY TEMPERATURE & FUNCTIONS OF SKIN

7. ENDOCRINOLOGY

General endocrinology - Enumeration of endocrine glands & hormones - General functions of endocrine system, chemistry, mechanism of secretion, transport, metabolism, regulation of secretion of hormones.

Hormones of anterior pituitary & their actions, hypothalamic regulation of anterior pituitary function.

Disorders of secretion of anterior pituitary hormones.

Posterior pituitary : Functions, regulation & disorders of secretion.

Thyroid: Histology, synthesis, secretion & transport of hormones, actions of hormones, regulation of secretion & disorders, Thyroid function tests.

Adrenal cortex & Medulla -synthesis, secretion, action, metabolism, regulation of secretion of hormones & disorders.

Other hormones - Angiotensin, A.N.F.

8. REPRODUCTION

Sex differentiation, Physiological anatomy of male and female sex organs,

Female reproductive system : Menstrual cycle, functions of ovary, actions of oestrogen & Progesterone, control of secretion of ovarian hormones, tests for ovulation, fertilisation, implantation, maternal changes during pregnancy, pregnancy tests & parturition.

Lactation, composition of milk, factors controlling lactation, milk ejection, reflex, Male reproductive system :spermatogenesis, semen and contraception.

9. CARDIO VASCULAR SYSTEM

Functional anatomy and innervation of heart Properties of cardiac muscle

Origin & propagation of cardiac impulse and heart block.

Electrocardiogram - Normal electrocardiogram. Two changes in ECG in myocardial infarction.

Cardiac cycle - Phases, Pressure changes in atria, ventricles & aorta.

Volume changes in ventricles. Jugular venous pulse, arterial pulse.

Heart sounds: Mention of murmurs.

Heart rate: Normal value, variation & regulation.

Cardiac output: Definition, normal values, one method of determination, variation, factors affecting heart rate and stroke volume.

Arterial blood pressure: Definition, normal values & variations, determinants, regulation & measurement of blood pressure.

Coronary circulation.

Cardio vascular homeostasis - Exercise & posture.

10. RESPIRATORY SYSTEM

Physiology of Respiration : External & internal respiration.

Functional anatomy of respiratory passage & lungs.

Respiratory movements: Muscles of respiration, Mechanism of inflation & deflation of lungs.

Intra pleural & intra pulmonary pressures & their changes during the phases of respiration.

Mechanics of breathing - surfactant, compliance & work of breathing.

Spirometry: Lung volumes & capacities definition, normal values, significance, factors affecting vital capacity, variations in vital capacity, FEV & its variations.

Pulmonary ventilation - alveolar ventilation & dead space - ventilation.

Composition of inspired air, alveolar air and expired air.

Exchange of gases: Diffusing capacity, factors affecting it.

Transport of Oxygen & carbon dioxide in the blood.

Regulation of respiration - neural & chemical.

Hypoxia, cyanosis, dyspnoea, periodic breathing.

Artificial respiration, pulmonary function tests.

11. CENTRAL NERVOUS SYSTEM

1. Organisation of central nervous system

2. Neuronal organisation at spinal cord level

3. Synapse receptors, reflexes, sensations and tracts

4. Physiology of pain

5. Functions of cerebellum, thalamus, hypothalamus and cerebral cortex.

6. Formation and functions of CSF

7. Autonomic nervous system

12. SPECIAL SENSES

Fundamental knowledge of vision, hearing, taste and smell.

PRACTICALS

The following list of practical is minimum and essential. All the practical have been categorised as procedures and demonstrations. The procedures are to be performed by the students during practical classes to acquire skills. All the procedures are to be included in the University practical examination. Those categorised as demonstrations are to be shown to the students during practical classes. However these demonstrations would not be included in the University examinations but question based on this would be given in the form of charts, graphs and calculations for interpretation by the students.

PROCEDURES

1. Enumeration of Red Blood Cells
2. Enumeration of White Blood Cells
3. Differential leucocyte counts
4. Determination of Haemoglobin
5. Determination of blood group
6. Determination of bleeding time and clotting time
7. Examination of pulse
8. Recording of blood pressure.

DEMONSTRATION:

1. Determination of packed cell volume and erythrocyte sedimentation rate
2. Determination of specific gravity of blood
3. Determination of erythrocyte fragility
4. Determination of vital capacity and timed vital capacity
5. Skeletal muscle experiments.

Study of laboratory appliances in experimental physiology. Frog's gastrocnemius sciatic preparation. Simple muscle curve, effects of two successive stimuli, effects of increasing strength of stimuli, effects of temperature, genesis of fatigue and tetanus. Effect of after load and free load on muscle contraction, calculation of work done.

6. Electrocardiography: Demonstration of recording of normal Electro cardiogram
7. Clinical examination of cardiovascular and respiratory system.

TEXT BOOKS:

Guyton; Text book of Physiology, 9th edition.

Ganong; Review of Medical Physiology, 19th edition
 Vander; Human physiology, 5th edition
 Choudhari; Concise Medical Physiology, 2nd edition
 Chatterjee; Human Physiology, 10th edition
 A.K. Jain; Human Physiology for BDS students, 1st edition

BOOKS FOR REFERENCE:

- i) Berne & Levey; Physiology, 2nd edition
- ii) West-Best & Taylor's, Physiological basis of Medical Practise, 11th edition

EXPERIMENTAL PHYSIOLOGY:

- i) Rannade; Practical Physiology, 4th edition
- ii) Ghai; a text book of practical physiology
- iii) Hutchison's; Clinical Methods, 20th edition

BIOCHEMISTRY

AIMS AND SCOPE OF THE COURSE IN BIOCHEMISTRY

The major aim is to provide a sound but crisp knowledge on the biochemical basis of the life processes relevant to the human system and to dental/medical practice. The contents should be organised to build on the already existing information available to the students in the pre-university stage and reorienting. A mere rehash should be avoided.

The chemistry portion should strive towards providing information on the functional groups, hydrophobic and hydrophilic moieties and weak valence forces that organise macromolecules. Details on structure need not be emphasised.

Discussion on metabolic processes should put emphasis on the overall change, interdependence and molecular turnover. While details of the steps may be given, the student should not be expected to memorise them. An introduction to biochemical genetics and molecular biology is a must but details should be avoided. The exposure to antivitamin, antimetabolites and enzyme inhibitors at this stage, will provide a basis for the future study of medical subjects. An overview of metabolic regulation is to be taught by covering hormonal action, second messengers and regulation of enzyme activities. Medical aspects of biochemistry should avoid describing innumerable functional tests, most of which are not in vogue. Cataloguing genetic disorders under each head of metabolism is unnecessary. A few examples which correlate genotype change to functional changes should be adequate.

At the end of the course the student would be able to acquire a useful core of information, which can be retained for a long time. Typical acid tests can be used to determine what is to be taught or what is to be learnt. A few examples are given below.

1. Need not know the structure of cholesterol. Should know why it cannot be carried free in plasma.
2. Mutarotation should not be taught. Student should know why amylase will not hydrolyse cellulose.
3. Need not know the details of alpha - helix and beta - pleats in proteins.
Should know why haemoglobin is globular and keratin is fibrous.
4. Need not know mechanism of oxidative phosphorylation.
Should know more than 90 % of ATP is formed by this process.
5. Need not know details of the conversion of pepsinogen to pepsin.
Should know hydrochloric acid cannot break a peptide bond at room temperature.
6. Need not remember the steps of glycogenesis.
Should know that excess intake of carbohydrate will not increase glycogen level in liver or muscle.
7. Need not know about urea or creatinine clearance tests.
Should know the basis of increase of urea and creatinine in blood in renal insufficiency.
8. Need not know the structure of insulin.
Should know why insulin level in circulation is normal in most cases of maturity onset diabetes.
9. Need not know the structural details of ATP.
Should know why about 10 g of ATP in the body at any given time meets all the energy needs.
10. Need not know the mechanism of action of polyhydroxylase.
Should know why the gum bleeds in scurvy.
11. Need not know the structure of Vitamin K.
Should know the basis of internal bleeding arising due to its deficiency.
12. Need not remember the structure of HMGCoA.
Should know why it does not lead to increased cholesterol synthesis in starvation.

BIOCHEMISTRY AND NUTRITION

1. CHEMISTRY OF BIOORGANIC MOLECULES

Carbohydrates: Definition, biological importance and classification. Monosaccharides - Isomerism, anomerism. Sugar derivatives, Disaccharides. Polysaccharides. Structures of starch and glycogen.

Lipids : Definition, biological importance and classification. Fats and fatty acids. Introduction to compound lipids. Hydrophobic and hydrophilic groups. Cholesterol. Bile salts. Micelle. Bimolecular leaflet.

Proteins: Biological importance. Aminoacids: Classification. Introduction to peptides. Proteins : Simple and conjugated; globular and fibrous. Charge properties. Buffer action . Introduction to protein conformation . Denaturation.

Nucleic acids: Building units . Nucleotides. Outline structure of DNA and RNA.

High energy compounds: ATP , Phosphorylamidines, Thioesters, Enol phosphates.

2. MACRONUTRIENTS AND DIGESTION

Energy needs: Basal metabolic rate. Dietary carbohydrates, fibres. Dietary lipids, essential fatty acids. Nitrogen balance. Essential amino acids. Protein quality and requirement (methods for evaluation of protein quality to be excluded). Protein calorie malnutrition. Balanced diet.

Enzymatic hydrolysis of dietary carbohydrates. Mechanism of uptake of monosaccharides. Digestion and absorption of triacylglycerols. Enzymatic hydrolysis of dietary proteins and uptake of amino acids.

3. MICRONUTRIENTS

Vitamins: Definition, classification, daily requirement, sources and deficiency symptoms. Brief account of water-soluble vitamins with biochemical functions. Vitamins A functions including visual process. Vitamin D and its role in calcium metabolism. Vitamin E. Vitamin K and gamma carboxylation. Introduction to antivitamins and hypervitaminosis.

Minerals :Classification, daily requirement. Calcium and phosphate: sources, uptake, excretion, function. Serum calcium regulation. Iron: sources, uptake and transport.

Heme and nonheme iron functions; deficiency. Iodine: Brief introduction to thyroxine synthesis. General functions of thyroxine. Fluoride: function, deficiency and excess. Indications of role of other minerals.

4. ENERGY METABOLISM

Overview: Outlines of glycolysis, pyruvate oxidation and citric acid cycle. Beta oxidation of fatty acids. Electron transport chain and oxidative phosphorylation. Ketone body formation and utilisation. Introduction to glycogenesis, glycogenolysis, fatty acid synthesis, lipogenesis and lipolysis. Gluconeogenesis. Lactate metabolism . Protein utilisation for energy. Glucogenic and ketogenic amino acids. Integration of metabolism.

5. SPECIAL ASPECTS OF METABOLISM

Importance of pentose phosphate pathway. Formation of glucuronic acid. Outlines of cholesterol synthesis and breakdown. Ammonia metabolism. Urea formation. Phosphocreatine formation. Transmethylation. Amines. Introduction to other functions of amino acids including one carbon transfer. Detoxication : Typical reactions. Examples of toxic compounds. Oxygen toxicity

6. BIOCHEMICAL GENETICS AND PROTEIN SYNTHESIS

Introduction to nucleotides; formation and degradation. DNA as genetic material. Introduction to replication and transcription. Forms and functions of RNA. Genetic code and mutation. Outline of translation process. Antimetabolites and antibiotics interfering in replication, transcription and translation. Introduction to cancer, viruses and oncogenes.

7. ENZYME AND METABOLIC REGULATION

Enzymes: Definition, classification, specificity and active site. Cofactors. Effect of pH, temperature and substrate concentration. Introduction to enzyme inhibitors, proenzymes and isoenzymes. Introduction to allosteric regulation, covalent modification and regulation by induction/repression.

Overview of hormones. Introduction to second messengers, cyclic AMP, calcium ion, inositol triphosphate. Mechanism of action of steroid hormones, epinephrine, glucagon and insulin in brief. Acid base regulation. Electrolyte balance.

8. STRUCTURAL COMPONENTS AND BLOOD PROTEINS

Connective tissue: Collagen and elastin. Glycosaminoglycans. Bone structure. Structure of membranes. Membrane associated processes in brief. Exocytosis and endocytosis. Introduction to cytoskeleton. Myofibril and muscle contraction in brief.

Haemoglobin: functions. Introduction to heme synthesis and degradation. Plasma proteins: classification and separation. Functions of albumin. A brief account of immunoglobulins. Plasma lipoproteins: Formation, function and turnover.

9. MEDICAL BIOCHEMISTRY

Regulation of blood glucose. Diabetes mellitus and related disorders. Evaluation of glycemic status. Hyperthyroidism and hypothyroidism: Biochemical evaluation. Hyperlipoproteinemias and atherosclerosis, Approaches to treatment. Jaundice: Classification and evaluation. Liver function tests: Plasma protein pattern, serum enzymes levels. Brief introduction to kidney function tests and gastric function tests. Acid base imbalance. Electrolyte imbalance: evaluation. Gout. Examples of genetic disorders including lysosomal storage disorders, glycogen storage disorders, glucose 6- phosphate dehydrogenase deficiency, hemoglobinopathies, inborn errors of amino acid metabolism and muscular dystrophy (one or two examples with biochemical basis will be adequate). Serum enzymes in diagnosis.

PRACTICALS: Contact hours 50

- | | |
|--|---|
| 1. Qualitative analysis of carbohydrates | 4 |
| 2. Color reactions of proteins and amino acids | 4 |

3. Identification of nonprotein nitrogen substance	4
4. Normal constituents of urine	4
5. Abnormal constituents of urine	4
6. Analysis of saliva including amylase	2
7. Analysis of milk Quantitative estimations	2
8. Titrable acidity and ammonia in urine	2
9. Free and total acidity in gastric juice	2
10. Blood glucose estimation	2
11. Serum total protein estimation	2
12. Urine creatinine estimation Demonstration	2
13. Paper electrophoresis charts/clinical data evaluation	2
14. Glucose tolerance test profiles	2
15. Serum lipid profiles	1
16. Profiles of hypothyroidism and hyperthyroidism	1
17. Profiles of hyper and hypoparathyroidism	1
18. Profiles of liver function	1
19. Urea, uric acid creatinine profile in kidney disorders	1
20. Blood gas profile in acidosis/ alkalosis	1

RECOMMENDED BOOKS:

1. Concise text book of Biochemistry (3rd edition) 2001, T.N. Pattabiraman
2. Nutritional Biochemistry 1995, S. Ramakrishnan and S.V. Rao
3. lecture notes in Biochemistry 1984, J.K. Kandlish

Reference books:

1. Text book of Biochemistry with clinical correlations 1997, T.N. Devlin
2. Harper's Biochemistry, 1996., R.K. Murray et.al
3. Basic and applied Dental Biochemistry, 1979, R.A.D. Williams & J.C.Elliot

3. DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY

INTRODUCTION

Dental Anatomy including Embryology and Oral Histology – a composite of basic Dental Sciences & their clinical applications.

SKILLS

The student should acquire basic skills in :

1. Carving of crowns of permanent teeth in wax.
2. Microscopic study of Oral tissues.
3. Identification of Deciduous & Permanent teeth.
4. Age estimation by patterns of teeth eruption from plaster casts of different age groups.

OBJECTIVES

After a course on Dental Anatomy including Embryology and Oral Histology,

1. The student is expected to appreciate the normal development, morphology, structure & functions of oral tissues & variations in different pathological/non-pathological states.
2. The student should understand the histological basis of various dental treatment procedures and physiologic ageing process in the dental tissues.
3. The students must know the basic knowledge of various research methodologies.

I. TOOTH MORPHOLOGY

1. Introduction to tooth morphology:
 - ◆ Human dentition, types of teeth, & functions, Palmer's & Binomial notation systems, tooth surfaces, their junctions - line angles & point angles, definition of terms used in dental morphology, geometric concepts in tooth morphology, contact areas & embrasures - Clinical significance.
2. Morphology of permanent teeth :
 - Description of individual teeth, along with their endodontic anatomy & including a note on their chronology of development, differences between similar class of teeth & identification of individual teeth.
 - Variations & Anomalies commonly seen in individual teeth.
3. Morphology of Deciduous teeth :
 - ◆ Generalized differences between Deciduous & Permanent teeth.
 - ◆ Description of individual deciduous teeth, including their chronology of development, endodontic anatomy, differences between similar class of teeth & identification of individual teeth.
4. Occlusion :
 - ◆ Definition, factors influencing occlusion - basal bone, arch, individual teeth, external & internal forces & sequence of eruption.
 - ◆ Inclination of individual teeth - compensatory curves.
 - ◆ Centric relation & Centric occlusion - protrusive, retrusive & lateral occlusion.
 - ◆ Clinical significance of normal occlusion.
 - ◆ Introduction to & Classification of Malocclusion.

II. ORAL EMBRYOLOGY

1. Brief review of development of face, jaws, lip, palate & tongue, with applied aspects.
2. Development of teeth :
 - ◆ Epithelial mesenchymal interaction, detailed study of different stages of development of crown, root & supporting tissues of tooth & detailed study of formation of calcified tissues.
 - ◆ Applied aspects of disorders in development of teeth.
3. Eruption of deciduous & Permanent teeth :
 - ◆ Mechanisms in tooth eruption, different theories & histology of eruption, formation of dentogingival junction, role of gubernacular cord in eruption of permanent teeth.
 - ◆ Clinical or Applied aspects of disorders of eruption.
4. Shedding of teeth :
 - ◆ Factors & mechanisms of shedding of deciduous teeth.
 - ◆ Complications of shedding.

III. ORAL HISTOLOGY

1. Detailed microscopic study of Enamel, Dentine, Cementum & Pulp tissue. Age changes & Applied aspects (Clinical and forensic significance) of histological considerations - Fluoride applications, transparent dentine, dentine hypersensitivity, reaction of pulp tissue to varying insults to exposed dentine ; Pulp calcifications & Hypercementosis.
2. Detailed microscopic study of Periodontal ligament & alveolar bone, age changes, histological changes in periodontal ligament & bone in normal & orthodontic tooth movement, applied aspects of alveolar bone resorption.
3. Detailed microscopic study of Oral Mucosa, variation in structure in relation to functional requirements, mechanisms of keratinization, clinical parts of gingiva, Dentogingival & Mucocutaneous junctions & lingual papillae. Age changes & clinical considerations.
4. Salivary Glands :
 - ◆ Detailed microscopic study of acini & ductal system.
 - ◆ Age changes & clinical considerations.
5. TM Joint :
 - ◆ Review of basic anatomical aspects & microscopic study & clinical considerations.
6. Maxillary Sinus :
 - ◆ Microscopic study, anatomical variations, functions & clinical relevance of maxillary sinus in dental practice.
7. Processing of Hard & soft tissues for microscopic study :
 - ◆ Ground sections, decalcified sections & routine staining procedures.
8. Basic histochemical staining patterns of oral tissues.

IV. ORAL PHYSIOLOGY

1. Saliva :
 - ◆ Composition of saliva - variations, formation of saliva & mechanisms of secretion, salivary reflexes, brief review of secretomotor pathway, functions, role of saliva in dental caries & applied aspects of hyper & hypo salivation.
2. Mastication :
 - ◆ Masticatory force & its measurement - need for mastication, peculiarities of masticatory muscles, masticatory cycle, masticatory reflexes & neural control of mastication.
3. Deglutition :
 - ◆ Review of the steps in deglutition, swallowing in infants, neural control of deglutition & dysphagia.
4. Calcium, Phosphorous & fluoride metabolism :
 - ◆ Source, requirements, absorption, distribution, functions & excretion, clinical considerations, hypo & hypercalcemia & hyper & hypo phosphatemia & fluorosis.
5. Theories of Mineralization :
 - ◆ Definition, mechanisms, theories & their drawbacks.
 - ◆ Applied aspects of physiology of mineralization, pathological considerations - calculus formation.
6. Physiology of Taste :
 - ◆ Innervation of taste buds & taste pathway, physiologic basis of taste sensation, age changes & applied aspects - taste disorders.
7. Physiology of Speech :
 - ◆ Review of basic anatomy of larynx & vocal cords.
 - ◆ Voice production, resonators, production of vowels & different consonants - Role of palate, teeth & tongue.
 - ◆ Effects of dental prosthesis & appliances on speech & basic speech disorders.

RECOMMENDED TEXT BOOKS

1. Orban's Oral Histology & Embryology - S.N.Bhaskar
2. Oral Development & Histology - James & Avery
3. Wheeler's Dental Anatomy, Physiology & Occlusion - Major.M.Ash
4. Dental Anatomy - its relevance to dentistry - Woelfel & Scheid
5. Applied Physiology of the mouth - Lavelle
6. Physiology & Biochemistry of the mouth - Jenkins

4. GENERAL PATHOLOGY

AIM:

At the end of the course the student should be competent to:

Apply the scientific study of disease processes, which result in morphological and functional alterations in cells, tissues and organs to the study of pathology and the practice of dentistry.

OBJECTIVES:

Enabling the student

1. To demonstrate and apply basic facts, concepts and theories in the field of Pathology.
2. To recognize and analyze pathological changes at macroscopically and microscopical levels and explain their observations in terms of disease processes.
3. To Integrate knowledge from the basic sciences, clinical medicine and dentistry in the study of Pathology.
4. To demonstrate understanding of the capabilities and limitations of morphological Pathology in its contribution to medicine, dentistry and biological research.
5. To demonstrate ability to consult resource materials outside lectures, laboratory and tutorial classes.

COURSE CONTENT

A. General Pathology –

1. Introduction to Pathology
 - Terminologies
 - The cell in health
 - The normal cell structure
 - The cellular functions
2. Etiology and Pathogenesis of Disease
 - Cell Injury
 - Types – congenital
 - Acquired
 - Mainly Acquired causes of disease
(Hypoxic injury, chemical injury, physical injury, immunological injury)
3. Degenerations
 - Amyloidosis
 - Fatty change
 - Cloudy swelling
 - Hyaline change, mucoid degeneration
4. Cell death & Necrosis
 - Apoptosis
 - Def, causes, features and types of necrosis
 - Gangrene - Dry, wet, gas
 - Pathological Calcifications
(Dystrophic and metastatic)
5. Inflammation
 - Definition, causes types, and features
 - Acute inflammation
 - a. The vascular response
 - b. The cellular response
 - c. Chemical mediators
 - d. The inflammatory cells
 - e. Fate
 - Chronic inflammation
 - Granulomatous inflammation
6. Healing
 - Regeneration
 - Repair
 - a. Mechanisms
 - b. Healing by primary intention
 - c. Healing by secondary intention
 - d. Fracture healing
 - e. Factors influencing healing process
 - f. Complications
7. Tuberculosis
 - Epidemiology
 - Pathogenesis (Formation of tubercle)
 - Pathological features of Primary and secondary TB
 - Complications and Fate
8. Syphilis
 - Epidemiology
 - Types and stages of syphilis

- Pathological features
 - Diagnostic criterias
 - Oral lesions
9. Typhoid
 - Epidemiology
 - Pathogenesis
 - Pathological features
 - Diagnostic criterias
 10. Thrombosis
 - Definition, Pathophysiology
 - Formation, complications & Fate of a thrombus
 11. Embolism
 - Definition
 - Types
 - Effects
 12. Ischaemia and Infraction
 - Definition, etiology, types
 - Infraction of various organs
 13. Derangements of body fluids
 - Oedema – pathogenesis
 - Different types
 14. Disorders of circulation
 - Hyperaemia
 - Shock
 15. Nutritional Disorders
 - Common Vitamin Deficiencies
 16. Immunological mechanisms in disease
 - Humoral & cellular immunity
 - Hypersensitivity & autommunity
 17. AIDS and Hepatitis.
 18. Hypertension
 - Definition, classification
 - Pathophysiology
 - Effects in various organs
 19. Diabetes Mellitus
 - Def, Classification, Pathogenesis, Pathology in different organs
 20. Adaptive disorders of growth
 - Atrophy & Hypertrophy, Hyperplasia, Metaplasia and Dysplasia
 21. General Aspects of neoplasia
 - a. Definition, terminology, classification
 - b. Differences between benign and malignant neoplasms
 - c. The neoplastic cell
 - d. Metastasis
 - e. Etiology and pathogenesis of neoplasia, Carcinogenesis
 - f. Tumour biology
 - g. Oncogenes and anti-oncogenes
 - h. Diagnosis
 - i. Precancerous lesions
 - j. Common specific tumours, Sq papilloma & Ca, Basal cell Ca, Adenoma & Adenoca, Fibroma & Fibrosarcoma, Lipoma and liposarcoma
- B. Systemic Pathology –
- 22 Anaemias
 - Iron Deficiency anaemia, Megaloblastic anaemia
 23. Leukaemias
 - Acute and chronic leukaemias, Diagnosis and clinical features
 24. Diseases of Lymph nodes
 - Hodgkin's disease, Non Hodgkins lymphoma, Metastatic carcinoma
 25. Diseases of oral cavity
 - Lichen planus, Stomatitis, Leukoplakia, Sq cell Ca, Dental caries, Dentigerous cyst, Ameloblastoma
 26. Diseases of salivary glands
 - Normal structure, Sialadenitis, Tumours
 27. Common diseases of Bones
 - Osteomyelitis, Metabolic bone diseases, Bone Tumours, Osteosarcoma, Osteocalstoma, Giant cell Tumour, Ewing's sarcoma, Fibrous dysplasia, Aneurysmal bone cyst
 28. Diseases of Cardiovascular system
 - Cardiac failuare
 - Congenital heart disease – ASD, VSD, PDA
 - Fallot's Tetrolgy

- Infective Endocarditis
 - Atherosclerosis
 - Ischaemic heart Disease
29. Haemorrhagic Disorders
 Coagulation cascade
 Coagulation disorders
- Platelet function
 - Platelet disorders

Practicals

1. Urine – Abnormal constituents
 - Sugar, albumin, ketone bodies
2. Urine – Abnormal constituents
 - Blood, bile salts, bile pigments
3. Haemoglobin (Hb) estimation
4. Total WBC count
5. Differential WBC Count
6. Packed cell volume(PCV,) erythrocyte sedimentation Rate (ESR)
7. Bleeding Time & clotting Time
8. Histopathology
 - Tissue Processing
 - Staining
9. Histopathology slides
 - Acute appendicitis, Granulation tissue, fatty liver
10. Histopathology slides
 - CVC lung, CVC liver, Kidney amyloidosis
11. Histopathology slides
 - Tuberculosis, Actinomycosis, Rhinosporidiosis
12. Histopathology slides
 - Papilloma, Basal cell Ca, Sq cell Ca
13. Histopathology slides
 - Osteosarcoma, osteoclastoma, fibrosarcoma
14. Histopathology slides
 - Malignant melanoma, Ameloblastoma, Adenoma
15. Histopathology slides
 - Mixed parotid tumour, metastatic carcinoma in lymph node

List of Textbooks

1. Robbins – Pathologic Basis of Disease Cotran, Kumar, Robbins
2. Anderson's Pathology Vol 1 & 2 Editors – Ivan Damjanov & James Linder
3. Wintrobe's clinical Haematology Lee, Bithell, Foerster, Athens, Lukens

MICROBIOLOGY

AIM:

To introduce the students to the exciting world of microbes. To make the students aware of various branches of microbiology, importance, significance and contribution of each branch to mankind and other fields of medicine. The objectives of teaching microbiology can be achieved by various teaching techniques such as :

- a) Lectures
- b) Lecture Demonstrations
- c) Practical exercises
- d) Audio visual aids
- e) Small group discussions with regular feed back from the students.

OBJECTIVES:

A. KNOWLEDGE AND UNDERSTANDING

At the end of the Microbiology course the student is expected to :

1. Understand the basics of various branches of microbiology and able to apply the knowledge relevantly.
2. Apply the knowledge gained in related medical subjects like General Medicine and General Surgery and Dental subjects like Oral Pathology, Community Dentistry, Periodontics, Oral Surgery, Pedodontics, Conservative Dentistry and Oral medicine in higher classes.
3. Understand and practice various methods of Sterilisation and disinfection in dental clinics.
4. Have a sound understanding of various infectious diseases and lesions in the oral cavity.

A. SKILLS

1. Student should have acquired the skill to diagnose, differentiate various oral lesions.
2. Should be able to select, collect and transport clinical specimens to the laboratory.
3. Should be able to carry out proper aseptic procedures in the dental clinic.

A brief syllabus of Microbiology is given as follows:

A. GENERAL MICROBIOLOGY:

1. History, Introduction, Scope, Aims and Objectives.
2. Morphology and Physiology of bacteria.
3. Detail account of Sterilisation and Disinfection.
4. Brief account of Culture media and Culture techniques.
5. Basic knowledge of selection, collection, transport, processing of clinical Specimens and identification of bacteria.
6. Bacterial Genetics and Drug Resistance in bacteria.

B. IMMUNOLOGY:

1. Infection - Definition, Classification, Source, Mode of transmission and types of Infectious disease.
2. Immunity
3. Structure and functions of Immune system
4. The Complement System
5. Antigen
6. Immunoglobulins - Antibodies - General structure and the role played in defense mechanism of the body.
7. Immune response
8. Antigen - Antibody reactions - with reference to clinical utility.
9. Immuno deficiency disorders - a brief knowledge of various types of immuno deficiency disorders - A sound knowledge of immuno deficiency disorders relevant to dentistry.
10. Hypersensitivity reactions
11. Autoimmune disorders - Basic knowledge of various types - sound knowledge of autoimmune disorders of oral cavity and related structures.
12. Immunology of Transplantation and Malignancy
13. Immunehaematology

C. SYSTEMATIC BACTERIOLOGY:

1. Pyogenic cocci - Staphylococcus, Streptococcus, Pneumococcus, Gonococcus, Meningococcus – brief account of each coccus - detailed account of mode of spread, laboratory diagnosis, Chemo therapy and prevention - Detailed account of Cariogenic Streptococci.
2. Corynebacterium diphtheriae - mode of spread, important clinical feature, Laboratory diagnosis, Chemotherapy and Active immunisation.
3. Mycobacteria - Tuberculosis and Leprosy
4. Clostridium - Gas gangrene, food poisoning and tetanus.
5. Non-sporing Anaerobes - in brief about classification and morphology, in detail about dental pathogens - mechanism of disease production and prevention.
6. Spirochaetes - Treponema pallidum - detailed account of Oral Lesions of syphilis, Borrelia vincentii.
7. Actinomycetes.

D. VIROLOGY:

1. Introduction
2. General properties, cultivation, host - virus interaction with special reference to Interferon.
3. Brief account of Laboratory diagnosis, Chemotherapy and immuno prophylaxis in general.
4. A few viruses of relevance to dentistry.
 - Herpes Virus
 - Hepatitis B Virus - brief about other types
 - Human Immunodeficiency Virus (HIV)
 - Mumps Virus
 - Brief - Measles and Rubella Virus
5. Bacteriophage - structure and Significance

E. MYCOLOGY

1. Brief Introduction
2. Candidosis - in detail
3. Briefly on oral lesions of systemic mycoses.

F. PARASITOLOGY:

1. Brief introduction - protozoans and helminths
2. Brief knowledge about the mode of transmission and prevention of commonly seen parasitic infection in the region.

RECOMMENDED BOOKS FOR REGULAR READING:

1. Text book of Microbiology – R.Ananthanarayan & C.K.Jayaram Paniker.
2. Medical Microbiology – David Greenwood etal.

BOOKS FOR FURTHER READING/REFERENCE.

- i) Microbiology – Prescott, etal.
- ii) Microbiology – Bernard D. Davis , etal.
- iii) Clinical & Pathogenic Microbiology – Barbara J Howard, etal.
- iv) Mechanisms of Microbial diseases – Moselio Schaechter, etal.
- v) Immunology an Introduction – Tizard
- vi) Immunology 3rd edition – Evan Roitt , etal.

5. GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICSGOAL:

The broad goal of teaching under graduate students in pharmacology is to inculcate rational and scientific basis of therapeutics keeping in view of dental curriculum and Profession.

OBJECTIVES:

At the end of the course the student shall be able to:

- i) Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs in general and in dentistry in particular.
- ii) List the indications, contraindications; interactions, and adverse reactions of commonly used drugs with reason.
- iii) Tailor the use of appropriate drugs in disease with consideration to its cost, efficacy, safety for individual and mass therapy needs.
- iv) Indicate special care in prescribing common and essential drugs in special medical situations such as pregnancy, lactation, old age, renal, hepatic damage and immuno compromised patients.
- v) Integrate the rational drug therapy in clinical pharmacology.
- vi) Indicate the principles underlying the concepts of “Essential drugs”.

SKILLS:

At the end of the course the student shall be able to:

- 1) Prescribe drugs for common dental and medical ailments.
- 2) To appreciate adverse reactions and drug interactions of commonly used drugs.
- 3) Observe experiments designed for study of effects of drugs.
- 4) Critically evaluate drug formulations and be able to interpret the clinical pharmacology of marketed preparations commonly used in dentistry.
- 5) INTEGRATION: Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical departments.

LECTURE:

I. GENERAL PHARMACOLOGY:

1. General principles of pharmacology; sources and nature of drugs dosage forms; prescription writing; pharmacokinetics (absorption, distribution, metabolism and excretion of drugs), mode of action of drugs, combined effects of drugs, receptor mechanism of drug action, factors modifying drug response, adverse drug reactions; drug interactions, Implications of General Principles in clinical dentistry.
2. CNS drugs; General anaesthetics, hypnotics, analgesics psychotropic drugs, anti – epileptics, muscle relaxants, local anaesthetics, Implications of these drugs in clinical dentistry.
3. Autonomic drugs; sympathomimetics, antiadrenergic drugs parasymphomimetics and parasympatholytics, Implications of Autonomic drugs in clinical dentistry.
4. Cardiovascular drugs; Cardiac stimulants ; antihypertensive drugs, vasopressor agents, treatment of shock, Antianginal agents and diuretics, Implications of these drugs in clinical dentistry.
5. Autocoids:
Histamine, antihistamines, prostaglandins, leukotriens and bronchodilators, Implications of Autocoids in clinical dentistry.
6. Drugs acting on blood : coagulants and anticoagulants, hematinics, Implications of these drugs in clinical dentistry.
7. G.I.T. Drugs, Purgatives, anti-diarrhoeal, antacids, anti-emetics, Implications of these drugs in clinical dentistry.
8. Endocrines; Emphasis on treatment of diabetes and glucocorticoids, thyroid and antithyroid agents, drugs affecting calcium balance and anabolic steroids, Implications of these drugs in clinical dentistry.
9. Chemotherapy: Antimicrobial agents (against bacteria, anaerobic infections, fungi, virus and broad spectrum). Infection management in dentistry. Phamacotherapy of Tuberculosis, leprosy and chemotherapy of malignancy in general. Implications of Chemotherpy in clinical dentistry.
10. Vitamins : Water soluble vitamins, Vit. D, Vit.K. and Vit. E, Implications of Vitamins in clinical dentistry.
11. Pharmacotherapy of emergencies in dental office and emergency drugs tray Implications of Pharmacotherapy in clinical dentistry.
12. Chealating agents – BAL,EDTA and desferrioxamine,

II. DENTAL PHARMACOLOGY

1. Anti - septics, astrigents, obtundents, mummifying agents, bleaching agents, styptics, disclosing agents, dentifrices, mouth washes, caries and fluorides.
2. Pharmacotherapy of common oral conditions in dentistry.
Practicals and Demonstrations :
To familiarise the student with the methodology: prescription writing and dispensing. Rationale of drug combinations of marketed drugs.

LIST OF BOOKS RECOMMENDED FOR READING AND REFERENCE

1. R.S.Satoskar, Kale Bhandarkar's Pharmacology and Pharmacolherapeutics, 10th Edition, Bombay Popular Prakashan 1991.
2. Bertam G Katzung, Basic and Clinical pharmacology 6th ed. Appleton & Lange 1997.
3. Lauerence D.R. Clinical Pharmacology 8th ed. Churchill Livingstone 1997.
4. Satoskar R.S. & Bhandarkar S.D., Pharmacology and Pharmacotherapeutics part I & part ii, 13th Popular Prakashan Bombay 1993.
5. Tripathi K.D., Essentials of Medical Pharmacology 4th ed Jaypee Brothers 1999.

6. DENTAL MATERIALS

The science of Dental Material has undergone tremendous changes over the years. Continued research has led to new material systems and changing concepts in the dental field. Interlinked with various specialised branches of chemistry, practically all engineering applied sciences and biological characteristics, the science of dental material emerged as a basic sciences in itself with its own values and principles.

INTRODUCTION

AIMS:

Aim of the course is to present basic chemical and physical properties of Dental materials as they are related to its manipulation to give a sound educational background so that the practice of the dentistry emerged from art to empirical status of science as more information through further research becomes available. It is also the aim of the course of Dental materials to provide with certain criteria of selection and which will enable to discriminate between facts and propaganda with regards to claims of manufactures.

OBJECTIVES:

To understand the evolution and development of science of dental material.

To explain purpose of course in dental materials to personnels concerned with the profession of the dentistry. Knowledge of physical and chemical properties. Knowledge of biomechanical requirements of particular restorative procedure. An intelligent compromise of the conflicting as well as co-ordinating factors into the desired Ernest. Laying down standards or specifications of various materials to guide to manufacturers as well as to help professionals.

Search for newer and better materials which may answer our requirements with greater satisfaction. To understand and evaluate the claims made by manufactures of dental materials

NEEDS FOR THE COURSE:

The profession has to rise from an art to a science, , the need for the dentist to possess adequate knowledge of materials to exercises his best through knowledge of properties of different types of materials. The growing concern of health hazards due to mercury toxicity, inhalation of certain vapour or dust materials, irritations and allergic reaction to skin due to contact of materials. Materials causing irritation of oral tissues, pH of restorative materials causing inflammation and necrosis of pulp which is a cause for the dentist to posses wider knowledge of physical, chemical and biological properties of materials being used. For the protection for the patient and his own protection certain criteria of selection are provided that will enable the dentist to discriminate between facts and propaganda, which will make a material biologically accept.

SCOPE:

The dental materials is employed in mechanical procedures including restorative dentistry such as Prosthodontics, endodontics, periodontal, orthodontics and restorative materials. There is scarcely a dental procedure that does not make use of dental materials in one form or another and therefore the application of dental material is not limited to any one branch of dentistry. Branches such as minor surgery and periodontics require less use of materials but the physical and chemical characters of materials are important in these fields.

The toxic and tissue reaction of dental materials and their durability in the oral cavity where the temperature is between 32 & 37 degree centigrade, and the ingestion of hot or cold food ranges from 0-70 degree centigrade. The acid an alkalinity of fluids shown pH varies from 4 to 8.5. The load on 1 sq. mm of tooth or restorative materials can reach to a level as high as many kilograms. Thus the biological properties of dental materials cannot be separated from their physical and chemical properties.

2). STRUCTURE OF MATTER AND PRINCIPLES OF ADHESION.

Change of state, inter atomic primary bonds, inter atomic secondary bonds, inter atomic bond distance and bonding energy, thermal energy, crystalline structure, non crystalline structures, diffusion, adhesion and bonding and adhesion to tooth structures.

3). IMPORTANT PHYSICAL PROPERTIES APPLICABLE TO DENTAL MATERIALS

Physical properties are based on laws of mechanics, acoustics, optics, thermodynamics, electricity, magnetism, radiation, atomic structure or nuclear phenomena. Hue, value, chroma and translucency physical properties based on laws of optics, dealing with phenomena of light, vision and sight. Thermal conductivity & coefficient of thermal expansion are physical properties based on laws of thermodynamics. Stress, strain, proportional limit, elastic limit yield strength, modulus of elasticity, flexibility, resilience, impact, impact strength, permanent deformation, strength, flexure strength fatigue, static fatigue, toughness, brittleness, ductility & malleability, hardness, abrasion resistance, relaxation, rheology, Thixotropic, creep, static creep, dynamic creep, flow, colour, three dimensional colour – hue, values, chroma, Munsell system, metamersim, fluorescence, physical properties of tooth, stress during mastication

4). BIOLOGICAL CONSIDERATIONS IN USE OF DENTAL MATERIALS.

Materials used are with the knowledge of appreciation of certain biological considerations for use in oral cavity. Requirement of materials with biological compatibility. Classification of materials from perspective of biological compatibility. eg. contact with soft tissues, affecting vitality of pulp, used for root canal fillings, affecting hard tissues of teeth, laboratory materials that could be accidentally be inhaled or ingested during handling. Hazards associated with materials: pH-affecting pulp, polymers causing chemical irritation, mercury toxicity, etc. Microleakage, Thermal changes, Galvanism, toxic effect of materials. Biological evaluation for systemic toxicity, skin irritation, mutagenicity and carcinogenicity. Disinfection of dental materials for infection control.

5). GYPSUM & GYPSUM PRODUCTS.

Gypsum – its origin, chemical formula, Products manufactured from gypsum.

Dental plaster, Dental stone, Die stone, high strength, high expansion stone.

Application and manufacturing procedure of each, macroscopic and microscopic structure of each . Supplied as and Commercial names.

Chemistry of setting, setting reaction, theories of setting, gauging water, Microscopic structure of set material.

Setting time: working time and setting time, Measurement of setting time and factors controlling setting time .

Setting expansion, Hygroscopic setting expansion – factors affecting each

Strength :wet strength, dry strength, factors affecting strength, tensile strength

Slurry – need and use.

Care of cast.

ADA classification of gypsum products

Description of impression plaster and dental investment

Manipulation including recent methods or advanced methods.

Disinfection : infection control, liquids, sprays, radiation

Method of use of disinfectants

Storage of material – shelf life

6) IMPRESSION MATERIALS USED IN DENTISTRY

Impression plaster, Impression compound, Zinc oxide eugenol impression paste & bite registration paste incl., non eugenol paste, Hydrocolloids, reversible and irreversible, Elastomeric impression materials. Polysulphide, Condensation silicones, Addition silicones, Polyether, Visible light cure polyether urethane dimethacrylate, Historical background & development of each impression material, Definition of impression , Purpose of making impression, Ideal properties required and application of material, Classification as per ADA specification, general & individual impression material.

Application and their uses in different disciplines, Marketed as and their commercial names, Mode of supply & mode of application bulk/wash impression. Composition, chemistry of setting ,Control of setting time , Type of impression trays required, Adhesion to tray, manipulation, instruments & equipments required. Techniques of impression, storage of impression, (Compatibility with cast and die material). Any recent advancements in material and mixing devices. Study of properties: Working time, setting time, flow, accuracy, strength, flexibility, tear strength, dimensional stability, compatibility with cast & die materials incl., electroplating Biological properties: tissue reaction , Shelf life & storage of material, Infection control – disinfection, Advantages & disadvantages of each material.

7). SYNTHETIC RESINS USED IN DENTISTRY.

Historical background and development of material, Denture base materials and their classification and requirement

Classification of resins

Dental resins – requirements of dental resins, applications, polymerisation, polymerisation mechanism stages in addition polymerisation, inhibition of polymerisation, co polymerization, molecular weight, crosslinking, plastixizers, Physical properties of polymers, polymer structures types of resins.

ACRYLIC RESINS:

Mode of polymerisation: Heat activated, Chemically activated, Light activated, Mode of supply, application, composition, polymerisation reaction of each. Technical considerations: Methods of manipulation for each type of resin. Physical properties of denture base resin. Miscellaneous resins & techniques: Repair resins, Relining and rebasing. Short term and long-term soft-liners, temporary crown

and bridge resins, Resin impression trays, Tray materials, Resin teeth, materials in maxillofacial prosthesis, Denture cleansers, Infection control in detail, Biological properties and allergic reactions.

RESTORATIVE RESINS:

Historical background, Resin based restorative materials, Unfilled & filled, Composite restorative materials, Mode of supply, Composition, Polymerisation mechanisms: Chemically activated, Light activated, Dual cure: Degree of conversion, Polymerisation shrinkage Classification of Composites: Application, composition and properties of each Composites of posterior teeth, Prosthodontics resins for veneering. Biocompatibility – microleakage, pulpal reaction, pulpal protection Manipulation of composites: Techniques of insertion of Chemically activated, light activated, dual cure Polymerisation, Finishing and polishing of restoration, Repair of composites Direct bonding Bonding: Need for bonding, Acid - etch technique, Enamel bonding, Dentin bonding agents. Mode of bonding, Bond strength, Sandwich technique its indication and procedure. Extended application for composites: Resins for restoring eroded teeth, Pit and fissure sealing, Resin inlays system – Indirect & direct, Core build up, Orthodontic applications.

8). METAL AND ALLOYS:

Structure and behaviour of metals, Solidification of metals, mechanism of crystallisation amorphous & crystalline. Classification of alloys, Solid solutions, Constitutes or equilibrium phase diagrams: Electric alloys, Physical properties, Peritectic alloys, Solid state reaction other binary systems: Metallography & Heat treatment. Tarnish and corrosion. Definition: causes of corrosion, protection against corrosion., Corrosion of dental restorations, clinical significance of galvanic current. Dental Amalgam.

History:

Definition of dental amalgam, application, Alloy classification, manufacture of alloy powder composition - available as.

Amalgamation : setting reaction & resulting structure , properties , Microleakage

Dimensional stability, Strength, Creep, Clinical performance

Manipulation: Selection of alloy, proportioning, mechanism of trituration, condensation, carving & finishing. Effect of dimensional changes, Marginal deterioration., Repair of amalgam, mercury toxicity, mercury hygiene.

DIRECT FILLING GOLD:

Properties of pure gold, mode of adhesion of gold for restoration forms of direct filling gold for using as restorative material

Classification : Gold Foil, Electrolytic precipitate, powdered gold.

Manipulation: Removal of surface impurities and compaction of direct filling gold.

Physical properties of compacted gold, Clinical performance.

DENTAL CASTING ALLOYS:

Historical background, desirable properties of casting alloys.

Alternatives to cast metal technology: direct filling gold, amalgam, mercury free condensable intermetallic compound - an alternative to metal casting process. CAD-CAM process for metal & ceramic inlays - without need of impression of teeth or casting procedure, pure titanium, most bio compatible metal which are difficult to cast can be made into crowns with the aid of CAD- CAM technology . Another method of making copings - by copy milling (without casting procedures).

Classification of casting alloys: By function & description.

Recent classification , High noble (HN), Noble (N) and predominantly base metal (PB)

Alloys for crown & bridge, metal ceramic & removable partial denture. Composition, function, constituents and application, each alloy both noble and base metal. Properties of alloys: Melting range, mechanical properties, hardness, elongation, modulus of elasticity, tarnish and corrosion.

Casting shrinkage and compensation of casting shrinkage. Biocompatibility - Handling hazards & precautions of base metal alloys, casting investments used. Heat treatment : Softening & hardening heat treatment. Recycling of metals. Titanium alloys & their application , properties & advantages. Technical considerations In casting . Heat source, furnaces.

9). DENTAL WAXES INCLUDING INLAY CASTING WAX

Introduction and importance of waxes. Sources of natural waxes and their chemical nature.

Classification of Waxes:

Properties: melting range, thermal expansion, mechanical properties, flow & residual stresses, ductility. Dental Wax: Inlay wax: Mode of supply : Classification & composition, Ideal requirements: Properties of inlay wax: Flow, thermal properties Wax distortion & its causes.

Manipulation of inlay wax: Instruments & equipment required, including electrically heated instruments metal tips and thermostatically controlled wax baths.

Other waxes: Applications, mode of supply & properties.

Casting Wax, Base plate wax, Processing wax, Boxing wax, Utility wax, Sticky wax, Impression wax for corrective impressions, Bite registration wax.

10). DENTAL CASTING INVESTMENTS.

Definition, requirements, classification

Gypsum bonded - classification. Phosphate bonded, Silica bonded

Mode of Supply: Composition, application , setting mechanism, setting time & factors controlling.

Expansions :Setting expansion, Hygroscopic Setting expansion, & thermal expansion : factors affecting. Properties : Strength, porosity, and fineness & storage. Technical considerations: For Casting procedure, Preparation of die, Wax pattern, spruing, investing, control of shrinkage compensation, wax burnout, and heating the invested ring, casting. Casting machines, source of heat for melting the alloy. Defects in casting.

11). SOLDERING, BRAZING AND WELDING

Need of joining dental appliances, Terms & Definition

Solders: Definition, ideal requirement, types of solders – Soft & hard and their fusion temperature, application. Mode of supply of solders, Composition and selection, Properties. Tarnish & corrosion resistance mechanical properties, microstructure of soldered joint. Fluxes & Anti fluxes: Definition, Function, Types, commonly used fluxes & their selection Technique of Soldering & Brazing : free hand soldering and investment, steps and procedure. Welding,: Definition, application, requirements, procedure, weld decay - causes and how to avoid it. Laser welding.

WROUGHT BASE METAL ALLOYS

Applications and different alloys used mainly for orthodontics purpose

1. Stainless steel
2. Cobalt chromium nickel
3. Nickel titanium
4. Beta titanium

Properties required for orthodontic wires, working range, springiness, stiffness, resilience, Formability, ductility, ease of joining, corrosion resistance, stability in oral environment, bio compatibility

Stainless steels: Description, type, composition & properties of each type. Sensitisation & stabilisation , Mechanical properties – strength, tensile, yield strength, KHN. Braided & twisted wires their need , Solders for stainless steel, Fluxes, Welding

- 1.Wrought cobalt chromium nickel alloys, composition, allocation, properties, heat treatment, physical properties
- 2.Nickel – Titanium alloys, shape, memory & super elastic
- 3.Titanium alloys, application, composition, properties, welding, Corrosion resistance

12). DENTAL CEMENTS

Definition & Ideal requirements:

Cements: Silicate, Glass ionomer, metal modified glass ionomer, resin modified glass ionomer, zinc oxide eugenol, modified zinc oxide eugenol, zinc phosphate, zinc silico phosphate, zinc poly carboxylate, Cavity liners and cement bases, Varnishes Calcium hydroxide, Gutta percha

Application, classification (general and individual), setting mechanism, mode of supply, Properties, factors affecting setting, special emphasis on critical procedures of manipulation and protection of cement, mode of adhesion, biomechanism of caries inhibition.

Agents for pulpal protection., Modifications and recent advances, Principles of cementation. Special emphasis on cavity liners and cement bases and luting agents.

13). DENTAL CERAMICS

Historical background & General applications.

Dental ceramics : definition, classification, application, mode of supply, manufacturing procedure, methods of strengthening. Properties of fused ceramic: Strength and factors affecting, modulus of elasticity, surface hardness, wear resistance, thermal properties, specific gravity, chemical stability, esthetic properties, biocompatibility, technical considerations.

Metal Ceramics (PFM): Alloys - Types and composition of alloys. Ceramic - Type and Composition.

Metal Ceramic Bond - Nature of bond. Bonding using electro deposition, foil copings, bonded platinum foil, swaged gold alloy foil coping. Technical considerations for porcelain and porcelain fused metal restorations. Recent advances - all porcelain restorations, Manganese core, injection moulded, castable ceramics, glass infiltrated alumina core ceramic (In ceram), ceramic veneers, inlays and onlays, and CAD - CAM ceramic. Chemical attack of ceramic by fluoride. Porcelain furnaces.

14). ABRASION & POLISHING AGENTS

Definition of abrasion and polishing. Need of abrasion and polishing. Types of abrasives: Finishing, polishing & cleaning. Types of abrasives: Diamond, Emery, aluminium oxides garnet, pumice, Kieselgurh, tripoli, rouge, tin oxide, chalk, chromic oxide, sand, carbides, diamond, zirconium silicate Zinc oxide

ABRASIVE ACTION :

Desirable characteristics of an abrasive, Rate of abrasion, Size of particle, pressure and speed.

Grading of abrasive & polishing agents. Binder, Polishing materials & procedures used. Technical consideration - Material and procedure used for abrasion and polishing Electrolytic polishing and burnishing.

15). DIE AND COUNTER DIE MATERIALS INCLUDING ELECTROFORMING AND ELECTROPOLISHING.

Types – Gypsum products, Electroforming, Epoxy resin, Amalgam.

16). DENTAL IMPLANTS : Evolution of dental implants, types and materials.

17). MECHANICS OF CUTTING : Burs and points.

At the end of the course the student should have the knowledge about the composition, properties, manipulative techniques and their various commercial names. The student should also acquire skills to select and use the materials appropriately for laboratory and clinical use.

RECOMMENDED BOOKS:

1. Phillips Science of Dental Materials – 10th edn.- Kenneth J. Anusavice
2. Restorative Dental Materials – 10 edn. Robert G.Craig
3. Notes on Dental Materials – E.C. Combe

7. PRE CLINICAL CONSERVATIVE DENTISTRY LABORATORY EXERCISES

1. Identification and study of handcutting instruments chisels, gingival margin trimmers, excavators and hatchet.
2. Identification and use of rotary cutting instruments in contra angle hand pieces burs (Micromotor)
3. Preparation class I and extended class I and class II and MOD's and class V amounting to 10 exercises in plaster models.
4. 10 exercises in mounted extracted teeth of following class I, 4 in number class I extended cavities 2, class II 4 in number and Class V 2 in number. Cavity preparation base application matrix and wedge placement restoration with amalgam.
5. Exercises on phantom head models which includes cavity preparation base and varnish application matrix and wedge placement followed by amalgam restoration.

Class I	5
Class I with extension	2
Class II	10
Class II Mods	2
Class V and III for glass ionomers	4
Class V for amalgam	2
6. Polishing of above restorations.
7. Demonstration of Class III and Class V cavity preparation. For composites on extracted tooth completing the restoration.
8. Polishing and finishing of the restoration of composites.
9. Identification and manipulation of varnish bases like Zinc Phosphate, Poly carboxylate, Glass Ionomers, Zinc Oxide, Eugenol cements.
10. Identification and manipulation of various matrices, tooth separators and materials like composites and modified glass ionomer cements.
11. Cast Restoration
 1. Preparation of Class II inlay cavity
 2. Fabrication of wax pattern
 3. Sprue for inner attachment investing
 4. Investing of wax pattern
 5. Finishing and cementing of class II inlay in extracted tooth.
12. Endodontics
 1. Identification of basic endodontic instruments
 2. Coronal access cavity preparation on extracted. Upper central incisors
 3. Determination of working length.
 4. Biomechanical preparation of root canal space of central incisor
 5. Obfuration of root canal spaces. Absens of coronal access cavity.
 6. Closure of access cavity

8. ORAL PATHOLOGY & ORAL MICROBIOLOGY

OBJECTIVES:

At the end of Oral Pathology & Oral Microbiology course, the student should be able to comprehend -

1. The different types of pathological processes, that involve the oral cavity.
2. The manifestations of common diseases, their diagnosis & correlation with clinical pathological processes.
3. An understanding of the oral manifestations of systemic diseases should help in correlating with the systemic physical signs & laboratory findings.
4. The student should understand the underlying biological principles governing treatment of oral diseases.
5. The principles of certain basic aspects of Forensic Odontology.

SKILLS:

1. Microscopic study of common lesions affecting oral tissues through microscopic slides & projection slides.
2. Study of the disease process by surgical specimens.
3. Study of teeth anomalies/polymorphisms through tooth specimens & plaster casts.
4. Microscopic study of plaque pathogens.
5. Study of haematological preparations (blood films) of anaemias & leukemias.

6. Basic exercises in Forensic Odontology such as histological methods of age estimation and appearance of teeth in injuries.

1. INTRODUCTION:

◆ A bird's eye view of the different pathological processes involving the oral cavity & oral cavity involvement in systemic diseases to be brought out. Interrelationship between General Medicine & General Surgery & Oral pathology to be emphasized.

2. Developmental disturbances of teeth, jaws and soft tissues of oral & paraoral region :

◆ Introduction to developmental disturbances - Hereditary, Familial mutation, Hormonal etc. causes to be highlighted.

◆ Developmental disturbances of teeth - Etiopathogenesis, clinical features, radiological features & histopathological features as appropriate :-

The size, shape, number, structure & eruption of teeth & clinical significance of the anomalies to be emphasized.

◆ Forensic Odontology.

◆ Developmental disturbances of jaws - size & shape of the jaws.

◆ Developmental disturbances of oral & paraoral soft tissues - lip & palate - clefts, tongue, gingiva, mouth, salivary glands & face.

3. Dental Caries :

◆ Etiopathogenesis, microbiology, clinical features, diagnosis, histopathology, immunology, prevention of dental caries & its sequelae.

4. Pulp & Periapical Pathology & Osteomyelitis.

◆ Etiopathogenesis & interrelationship, clinical features, microbiology, histopathology & radiological features (as appropriate) of pulp & periapical lesions & osteomyelitis.

◆ Sequelae of periapical abscess - summary of space infections, systemic complications & significance.

5. Periodontal Diseases :

◆ Etiopathogenesis, microbiology, clinical features, histopathology & radiological features (as appropriate) of gingivitis, gingival enlargements & periodontitis. Basic immunological mechanisms of periodontal disease to be highlighted.

6. Microbial infections of oral soft tissues :

◆ Microbiology, defence mechanisms including immunological aspects, oral manifestations, histopathology and laboratory diagnosis of common bacterial, viral & fungal infections namely :-

Bacterial : Tuberculosis, Syphilis, ANUG & its complications - Cancrum Oris.

Viral : Herpes Simplex, Varicella zoster, Measles, Mumps & HIV infection.

Fungal : Candidal infection. Aphthous Ulcers.

7. Common non-inflammatory diseases involving the jaws :

◆ Etiopathogenesis, clinical features, radiological & laboratory values in diagnosis of :

Fibrous dysplasia, Cherubism, Osteogenesis Imperfecta, Paget's disease, Cleidocranial dysplasia, Rickets, Achondroplasia, Marfan's syndrome & Down's syndrome.

8. Diseases of TM Joint :

◆ Ankylosis, summary of different types of arthritis & other developmental malformations, traumatic injuries & myofascial pain dysfunction syndrome.

9. Cysts of the Oral & Paraoral region :

◆ Classification, etiopathogenesis, clinical features, histopathology, laboratory & radiological features (as appropriate) of Odontogenic cysts, Non-Odontogenic cysts, Pseudocysts of jaws & soft tissue cysts of oral & paraoral region.

10. Tumours of the Oral Cavity :

◆ Classification of Odontogenic, Non-Odontogenic & Salivary Gland Tumours. Etiopathogenesis, clinical features, histopathology, radiological features & laboratory diagnosis (as appropriate) of the following common tumours :-

a) Odontogenic - all lesions.

b) Non-odontogenic

- Benign Epithelial - Papilloma, Keratoacanthoma & Naevi.

- Benign Mesenchymal - Fibroma, Aggressive fibrous lesions, Lipoma, Haemangioma, Lymphangioma, Neurofibroma, Schwannoma, Chondroma, Osteoma & Tori.

- Malignant Epithelial - Basal Cell Carcinoma, Verrucous Carcinoma, Squamous Cell carcinoma & Malignant Melanoma.

- Malignant Mesenchymal - Fibrosarcoma, Osteosarcoma, Giant cell tumour, Chondrosarcoma, Angiosarcoma, Kaposi's sarcoma, Lymphomas, Ewing's sarcoma & Other Reticuloendothelial tumours.

c) Salivary Gland

- Benign Epithelial neoplasms - Pleomorphic Adenoma, Warthin's tumour, & Oncocytoma.

- Malignant Epithelial neoplasms - Adenoid Cystic Carcinoma, Mucoepidermoid Carcinoma, Acinic Cell Carcinoma & Adenocarcinomas.

- d) Tumours of Disputed Origin - Congenital Epulis & Granular Cell Myoblastoma.
 e) Metastatic tumours - Tumors metastasizing to & from oral cavity & the routes of metastasis.

11. Traumatic, Reactive & Regressive lesions of Oral Cavity :
- ◆ Pyogenic & Giant cell granuloma, exostoses Fibrous Hyperplasia, Traumatic Ulcer & Traumatic Neuroma.
 - ◆ Attrition, Abrasion, Erosion, Bruxism, Hypercementosis, Dentinal changes, Pulp calcifications & Resorption of teeth.
 - ◆ Radiation effects of oral cavity, summary of Physical & Chemical injuries including allergic reactions of the oral cavity.
 - ◆ Healing of Oral wounds & complications - Dry socket.
12. Non neoplastic Salivary Gland Diseases :
- ◆ Sialolithiasis, Sialosis, Sialadenitis, Xerostomia & Ptyalism.
13. Systemic Diseases involving Oral cavity :
- ◆ Brief review & oral manifestations, diagnosis & significance of common Blood, Nutritional, Hormonal & Metabolic diseases of Oral cavity.
14. Mucocutaneous Lesions :
- ◆ Etiopathogenesis, clinical features & histopathology of the following common lesions. Lichen Planus, Lupus Erythematosus, Pemphigus & Pemphigoid lesions, Erythema Multiforme, Psoriasis, Scleroderma, Ectodermal Dysplasia, Epidermolysis bullosa & White sponge nevus..
15. Diseases of the Nerves :
- ◆ Facial neuralgias - Trigeminal & Glossopharyngeal. VII nerve paralysis, Causalgia.
 - ◆ Psychogenic facial pain & Burning mouth syndrome.
16. Pigmentation of Oral & Paraoral region & Discolouration of teeth :
- ◆ causes & clinical manifestations.
17. Diseases of Maxillary Sinus :
- ◆ Traumatic injuries to sinus, Sinusitis, Cysts & Tumours involving antrum.
18. a) ORAL PRECANCER – CANCER; Epidemiology, aetiology, clinical and histopathological features, TNM classification. Recent advances in diagnosis, management and prevention.
 b) Biopsy : Types of biopsy, value of biopsy, cytology, histo chemistry & frozen sections in diagnosis of oral diseases.
19. Principles of Basic Forensic Odontology (Pre-clinical Forensic Odontology):
- ◆ Introduction, definition, aims & scope.
 - ◆ Sex and ethnic (racial) differences in tooth morphology and histological age estimation
 - ◆ Determination of sex & blood groups from buccal mucosa / saliva.
 - ◆ Dental DNA methods
 - ◆ Bite marks, rugae patterns & lip prints.
 - ◆ Dental importance of poisons and corrosives.
 - ◆ Overview of forensic medicine and toxicology

RECOMMENDED BOOKS

- | | |
|--|-------------------------------------|
| 1. A Text Book of Oral Pathology | - Shafer, Hine & Levy. |
| 2. Oral Pathology - Clinical Pathologic correlations | - Regezi & Sciubba. |
| 3. Oral Pathology | - Soames & Southam. |
| 4. Oral Pathology in the Tropics | - Prabhu, Wilson, Johnson & Daftary |

9. GENERAL MEDICINE

GUIDELINES:

Special emphasis should be given throughout on the importance of various diseases as applicable to dentistry.

1. Special precautions/ contraindication of anaesthesia and various dental procedures in different systemic diseases.
2. Oral manifestations of systemic diseases.
3. Medical emergencies in dental practice.

A dental student should be taught in such a manner he/she is able to record the arterial pulse, blood pressure and be capable of suspecting by sight and superficial examination of the body – diseases of the heart, lungs, kidneys, blood etc. He should be capable of handling medical emergencies encountered in dental practice.

THEORY SYLLABUS

CORE TOPICS (Must Know)

1. Aims of medicine Definitions of signs, symptoms, diagnosis, differential diagnosis treatment & prognosis.

2. Infections.

Enteric fever, AIDS, herpes simplex, herpes zoster, syphilis diphtheria.

COLLATERAL TOPICS (Desirable to Know)

Infectious mononucleosis mumps, measles, rubella, malaria.

3. G.I.T.

Stomatitis, gingival hyperplasia, dysphagia, acid peptic disease, jaundice, acute and chronic hepatitis, cirrhosis of liver ascites.

4. CVS

Acute rheumatic fever rheumatic valvular heart disease, hypertension, ischemic heart disease, infective endocarditis, common arrhythmias, congenital heart disease, congestive cardiac failure.

5. RS

Pneumonia, COPD, Pulmonary TB, Bronchial asthma

Diarrhea
Dysentery
Amoebiasis
Malabsorption

Lung Abscess
Pleural effusion
Pneumothorax
Bronchiectasis
Lung cancers.

6. Hematology

Anemias, bleeding & clotting disorders, leukemias, lymphomas, agranulocytosis, splenomegaly, oral manifestations of hematologic disorders, generalized Lymphadenopathy.

7. Renal System

Acute nephritis
Nephrotic syndrome

Renal failure

8. Nutrition

Avitaminosis

Balanced diet
PEM

Avitaminosis
- Meningitis
- Examination of comatose patient
- Examination of cranial nerves.
Addison's disease, Cushing's syndrome.

9. CNS

Facial palsy, facial pain including trigeminal neuralgia, epilepsy, headache including migraine.

10. Endocrines

Diabetes Mellitus Acromegaly, Hypothyroidism, Thyrotoxicosis, Calcium metabolism and parathyroids.

11. Critical care

Syncope, cardiac arrest, CPR, shock

Ac LVF
ARDS

CLINICAL TRAINING:

The student must be able to take history, do general physical examination (including build, nourishment, pulse, BP, respiration, clubbing, cyanosis, jaundice, lymphadenopathy, oral cavity) and be able to examine CVS, RS and abdomen and facial nerve.

10. GENERAL SURGERY

AIMS:

To acquaint the student with various diseases, which may require surgical expertise and to train the student to analyze the history and be able to do a thorough physical examination of the patient. The diseases as related to head and neck region are to be given due importance, at the same time other relevant surgical problems are also to be addressed. At the end of one year of study the student should have a good theoretical knowledge of various ailments, and be practically trained to differentiate benign and malignant diseases and be able to decide which patient requires further evaluation.

1. HISTORY OF SURGERY:

The development of surgery as a speciality over the years, will give the students an opportunity to know the contributions made by various scientists, teachers and investigators. It will also enable the student to understand the relations of various specialities in the practice of modern surgery.

2. GENERAL PRINCIPLES OF SURGERY:

Introduction to various aspects of surgical principles as related to orodental diseases. Classification of diseases in general. This will help the student to understand the various diseases, their relevance to routine dental practice.

3. WOUNDS:

Their classification, wound healing, repair, treatment of wounds, medico-legal aspects of accidental wounds and complications of wounds.

4. INFLAMMATION:

Of soft and hard tissues. Causes of inflammation, varieties, treatment and sequelae.

5. INFECTIONS:

Acute and chronic abscess skin infections, cellulitis, carbuncle, and erysipelas. Specific infections such as tetanus, gangrene, syphilis, gonorrhoea, tuberculosis, Actinomycosis, Vincents angina, cancrum oris. Pyaemia, toxemia and septicaemia.

6. TRANSMISSIBLE VIRAL INFECTIONS:

HIV and Hepatitis B with special reference to their prevention and precautions to be taken in treating patients in a carrier state.

7. **SHOCK AND HAEMORRHAGE:**
Classification, causes, clinical features and management of various types of shock. Syncope, Circulatory collapse. Haemorrhage – different types, causes, clinical features and management. Blood groups, blood transfusion, precautions and complications of blood and their products. Hemophilia's, their transmission, clinical features and management especially in relation to minor dental procedures.
8. **TUMOURS, ULCERS, CYSTS, SINUS AND FISTULAE:**
Classification, clinical examination and treatment principles in various types of benign and malignant tumours, ulcers, cysts, sinus and fistulae.
9. **DISEASES OF LYMPHATIC SYSTEM:**
Especially those occurring in head and neck region. Special emphasis on identifying diseases such as tubercular infection, lymphomas, leukaemias, metastatic lymph node diseases.
10. **DISEASES OF THE ORAL CAVITY:**
Infective and malignant diseases of the oral cavity and oropharynx including salivary glands with special emphasis on preventive aspects of premalignant and malignant diseases of the oral cavity.
11. **DISEASES OF LARYNX, NASOPHARYNX:**
Infections and tumours affecting these sites. Indications, procedure and complications of tracheostomy.
12. **NERVOUS SYSTEM:**
Surgical problems associated with nervous system with special reference to the principles of peripheral nerve injuries, their regeneration and principles of treatment. Detailed description of afflictions of facial nerve and its management. Trigeminal neuralgia, its presentation and treatment.
13. **FRACTURES:**
General principles of fractures, clinical presentation and treatment with additional reference to newer methods of fracture treatment. Special emphasis on fracture healing and rehabilitation.
14. **PRINCIPLES OF OPERATIVE SURGERY:**
Principles as applicable to minor surgical procedures including detailed description of asepsis, antiseptics, sterilisation, principles of anaesthesia and principles of tissue replacement. Knowledge of sutures, drains, diathermy, cryosurgery and use of Laser in surgery.
15. **ANOMOLIES OF DEVELOPMENT OF FACE:**
Surgical anatomy and development of face. Cleft lip and cleft palate—principles of management.
16. **DISEASES OF THYROID AND PARATHYROID:**
Surgical anatomy, pathogenesis, clinical features and management of dysfunction of thyroid and parathyroid glands. Malignant diseases of the thyroid—classification, clinical features and management.
17. **SWELLINGS OF THE JAW:**
Differential diagnosis and management of different types of swellings of the jaw.
18. **BIOPSY:**
Different types of biopsies routinely used in surgical practice.
Skills to be developed by the end of teaching is to examine a routine swelling, ulcer and other related diseases and to perform minor surgical procedures such as draining an abscess, taking a biopsy etc.

11. CONSERVATIVE DENTISTRY AND ENDODONTICS

OBJECTIVES:

- A. Knowledge and understanding
- B. Skills and
- C. Attitudes

A). Knowledge and under standing:

The graduate should acquire the following knowledge during the period of training.

- i. To diagnose and treat simple restorative work for teeth.
- ii. To gain knowledge about aesthetic restorative material and to translate the same to patients needs.
- iii. To gain the knowledge about endodontic treatment on the basis of scientific foundation.
- iv. To carry out simple endodontic treatment.
- v. To carry out simple luxation of tooth and its treatment and to provide emergency endodontic treatment.

SKILLS:

He should attain following skills necessary for practice of dentistry

- i) To use medium and high speed hand pieces to carry out restorative work.
- ii) Possesses the skills to use and familiarise endodontic instruments and materials needed for carrying out simple endodontic treatment.
- iii) To achieve the skills to translate patients esthetic needs along with function.

ATTITUDES:

- i). Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
- ii). Willingness to participate in CDE programme to update the knowledge and professional skill from time to time.
- iii). To help and participate in the implementation of the national oral health policy.
- iv). He should be able to motivate the patient for proper dental treatment at the same time proper maintenance of oral hygiene should be emphasised which will help to maintain the restorative work and prevent future damage.

INTRODUCTION :

Definition aims objectives of Conservative Dentistry scope and future of Conservative Dentistry.

1. Nomenclature Of Dentition:
Tooth numbering systems A.D.A. Zsigmondy Palmer and F.D.I. systems.
2. Principles Of Cavity Preparation :
Steps and nomenclature of cavity preparation classification of cavities, nomenclature of floors angles of cavities.
3. Dental Caries :
Aetiology, classification clinical features, morphological features, microscopic features, clinical diagnosis and sequel of dental caries.
4. Treatment Planning For Operative Dentistry:
Detailed clinical examination , radiographic examination, tooth vitality tests, diagnosis and treatment planning, preparation of the case sheet.
5. Gnathological Concepts Of Restoration:
Physiology of occlusion, normal occlusion, Ideal occlusion, mandibular movements and occlusal analysis. Occlusal rehabilitation and restoration.
6. Armamentarium For Cavity Preparation:
General classification of operative instruments, Hand cutting instruments design formula and sharpening of instruments. Rotary cutting instruments dental bur, mechanism of cutting, evaluation of hand piece and speed current concepts of rotary cutting procedures. Sterilisation and maintenance of instruments. Basic instrument tray set up.
7. Control of Operating Field:
Light source sterilisation field of operation control of moisture, rubber dam in detail, cotton rolls and anti sialogues.
8. Amalgam Restoration :
Indication contraindication, physical and mechanical properties , clinical behaviour. Cavity preparation for Class I , II, V and III. Step wise procedure for cavity preparation and restoration. Failure of amalgam restoration.
9. Pulp Protection :
Liners, varnishes and bases, Zinc phosphate, zinc polycarboxylate, zinc oxide eugenol and glass ionomer cements.
10. Anterior Restorations :
Selection of cases, selection of material, step wise procedures for using restorations , silicate (theory only) glass ionomers, composites, including sandwich restorations and bevels of the same with a note on status of the dentine bonding agents.
11. Direct Filling Gold Restorations :
Types of direct filling gold indications and limitations of cohesive gold. Annealing of gold foil cavity preparation and condensation of gold foils.
12. Preventive Measures In Restorative Practice :
Plaque Control, Pit and fissure sealants dietary measures restorative procedure and periodontal health. Contact and contour of teeth and restorations matrices tooth separation and wedges.
13. Temporisation or Interim Restoration.
14. Pin Amalgam Restoration Indication Contra Indication :
Advantages disadvantages of each types of pin methods of placement use of auto matrix. Failure of pin amalgam restoration.
15. Management Of Deep Carious Lesions Indirect And Direct Pulp Capping.
16. Non Carious Destruction's Tooth Structures Diagnosis and Clinical Management
17. Hyper Sensitive Dentine And Its Management.
18. Cast Restorations
Indications, contra indications, advantages and disadvantages and materials used for same Class II and Class I cavity preparation for inlays fabrication of wax pattern spurring inverting and casting procedures & casting defects.

19. Die Materials And Preparation Of Dies.
20. Gingival Tissue Management For Cast Restoration And Impression Procedures
21. Recent Cavity Modification Amalgam Restoration.
22. Differences between Amalgam And Inlay Cavity preparation with note on all the types of Bewels used for Cast Restoration.
23. Control Of Pain During Operative Procedures.
24. Treatment Planning For Operative Dentistry Detailed Clinical Examination Radiographic Examination
25. Vitality Tests, Diagnosis And Treatment Planning And Preparation Of Case Sheet.
26. Applied Dental Materials.
 1. Biological Considerations.
Evaluation, clinical application and adverse effects of the following materials. Dental cements, Zinc oxide euginol cements zinc phosphate cements, polycarboxylates glass ionomer cements, silicate cement calcium hydroxides varnishes.
 2. Dental amalgam, technical considerations mercury toxicity mercury hygiene.
 3. Composite, Dentine bonding agents, chemical and light curing composites
 4. Rubber base Imp. Materials
 5. Nobel metal alloys & non noble metal alloys
 6. Investment and die materials
 7. Inlay casting waxes
 8. Dental porcelain
 9. Aesthetic Dentistry
27. Endodontics: introduction definition scope and future of endodontics
28. Clinical diagnostic methods
29. Emergency endodontic procedures
30. Pulpal diseases causes, types and treatment .
31. Periapical diseases: acute periapical abscess, acute periodontal abscess phoeix abscess, chronic alveolar abscess granuloma cysts condensing osteits, external resorption.
32. Vital pulp therapy: indirect and direct pulp capping pulpotomy different types and medicaments used.
33. Apexogenesis and apexification or problems of open apex.
34. Rationale of endodontic treatment case selection indication and contraindications for root canal treatments.
35. Principles of root canal treatment mouth preparation root canal instruments, hand instruments, power driven instruments, standardisation color coding principle of using endodontic instruments. Sterilisation of root canal instruments and materials rubber dam application.
36. Anatomy of the pulp cavity: root canals apical foramen. Anomalies of pulp cavities access cavity preparation of anterior and premolar teeth.
37. Preparation of root canal space . Determination of working length, cleaning and shaping of root canals, irrigating solution chemical aids to instrumentation.
38. Disinfection of root canal space intracanal medicaments, poly antibiotic paste ross mans paste, mummifying agents. Out line of root canal treatment, bacteriological examinations, culture methods.
39. Problems during cleaning and shaping of root canal spaces. Perforation and its management. Broken instruments and its management, management of single and double curved root canals.
40. Methods of cleaning and shaping like step back crown down and conventional methods.
41. Obturation of the root canal system. Requirements of an ideal root canal filling material obturation methods using gutta percha healing after endodontic treatment. Failures in endodontics.
42. Root canal sealers. Ideal properties classification. Manipulation of root canal sealers.
43. post endodontic restoration fabrication and components of post core preparation.
44. smear layer and its importance in endodontics and conservative treatment.
45. discoloured teeth and its management. Bleaching agents, vital and non vital bleaching methods.
46. traumatised teeth classification of fractured teeth. Management of fractured tooth and root. Luxated teeth and its management.
47. endodontic surgeries indication contraindications, pre operative preparation. Pre medication surgical instruments and techniques apicectomy, retrograde filling, post operative sequale terphination hemisection, radiscetomy techniques of tooth reimplantation (both intentional and accidental) endodontic implants.
48. root resorption.
49. emergency endodontic procedures.
50. lasers in conservative endodontics (introduction only) practice management
51. professional association dentist act 1948 and its amendment 1993.
52. duties towards the govt. Like payments of professional tax, income tax.
53. financial management of practice
54. dental material and basic equipment management.
55. Ethics

12. ORAL & MAXILLOFACIAL SURGERY

AIMS:

To produce a graduate who is competent in performing extraction of teeth under both local and general anaesthesia, prevent and manage related complications, acquire a reasonable knowledge and understanding of the various diseases, injuries, infections occurring in the Oral & Maxillofacial region and offer solutions to such of those common conditions and has an exposure in to the in-patient management of maxillofacial problems.

OBJECTIVES:

a) Knowledge & Understanding:

At the end of the course and the clinical training the graduate is expected to -

1. Able to apply the knowledge gained in the related medical subjects like pathology, microbiology and general medicine in the management of patients with oral surgical problem.
2. Able to diagnose, manage and treat (understand the principles of treatment of) patients with oral surgical problems.
3. Knowledge of range of surgical treatments.
4. Ability to decide the requirement of a patient to have oral surgical specialist opinion or treatment.
5. Understand the principles of in-patient management.
6. Understanding of the management of major oral surgical procedures and principles involved in patient management.
7. Should know ethical issues and communication ability.

b) Skills:

1. A graduate should have acquired the skill to examine any patient with an oral surgical problem in an orderly manner. Be able to understand requisition of various clinical and laboratory investigations and is capable of formulating differential diagnosis.
2. Should be competent in the extraction of teeth under both local and general anaesthesia.
3. Should be able to carry out certain minor oral surgical procedures under L.A. like frenectomy, alveolar procedures & biopsy etc.
4. Ability to assess, prevent and manage various complications during and after surgery.
5. Able to provide primary care and manage medical emergencies in the dental office.
6. Understanding of the management of major oral surgical problems and principles involved in inpatient management.

DETAILED SYLLABUS

1. Introduction, definition, scope, aims and objectives.
2. Diagnosis in oral surgery:
 - (A) History taking
 - (B) Clinical examination
 - (C) Investigations.
3. Principles of infection control and cross-infection control with particular reference to HIV/AIDS and Hepatitis.
4. Principles of Oral Surgery -
 - a) Asepsis: Definition, measures to prevent introduction of infection during surgery.
 1. Preparation of the patient
 2. Measures to be taken by operator
 3. Sterilisation of instruments - various methods of sterilisation etc.
 4. Surgery set up.
 - b) Painless Surgery:
 1. Pre-anaesthetic considerations. Pre-medication: purpose, drugs used
 2. Anaesthetic considerations -
 - a) Local b) Local with IV sedations
 3. Use of general anaesthetic
 - c) Access:

Intra-oral: Mucoperiosteal flaps, principles, commonly used intra oral incisions.
 Bone Removal: Methods of bone removal.
 Use of Burs: Advantages & precautions
 Bone cutting instruments: Principles of using chisel & osteotome.
 Extra-oral: Skin incisions - principles, various extra-oral incision to expose facial skeleton.

 - a) Submandibular
 - b) Pre auricular
 - c) Incision to expose maxilla & orbit
 - d) Bicoronal incision
 - d) Control of haemorrhage during surgery

Normal Haemostasis
 Local measures available to control bleeding
 Hypotensive anaesthesia etc.
 - e) Drainage & Debridement

Purpose of drainage in surgical wounds

Types of drains used

Debridement: purpose, soft tissue & bone debridement.

- f) Closure of wounds
 - Suturing: Principles, suture material, classification, body response to various materials etc.
 - g) Post operative care
 - Post operative instructions
 - Physiology of cold and heat
 - Control of pain - analgesics
 - Control of infection - antibiotics
 - Control of swelling - anti-inflammatory drugs
 - Long term post operative follow up - significance.
5. Exodontia: General considerations
- Ideal Extraction.
- Indications for extraction of teeth
- Extractions in medically compromised patients.
- Methods of extraction -
- (a) Forceps or intra-alveolar or closed method.
 - Principles, types of movement, force etc.
 - (b) Trans-alveolar, surgical or open method, Indications, surgical procedure.
- Dental elevators: uses, classification, principles in the use of elevators, commonly used elevators.
- Complications of Exodontia -
- Complications during exodontia
- Common to both maxilla and mandible.
- Post-operative complications -
- Prevention and management of complications.
6. Impacted teeth:
- Incidence, definition, aetiology.
- (a) Impacted mandibular third molar.
 - Classification, reasons for removal,
 - Assessment - both clinical & radiological
 - Surgical procedures for removal.
 - Complications during and after removal,
 - Prevention and management.
 - (b) Maxillary third molar,
 - Indications for removal, classification,
 - Surgical procedure for removal.
 - (c) Impacted maxillary canine
 - Reasons for canine impaction,
 - Localization, indications for removal,
 - Methods of management, labial and palatal approach,
 - Surgical exposure, transplantation, removal etc.
7. Pre-prosthetic Surgery:
- Definition, classification of procedures
- (a) Corrective procedures: Alveoloplasty,
 - Reduction of maxillary tuberosities,
 - Frenectomies and removal of tori.
 - (b) Ridge extension or Sulcus extension procedures
 - Indications and various surgical procedures
 - (c) Ridge augmentation and reconstruction.
 - Indications, use of bone grafts, Hydroxyapatite
 - Implants - concept of osseointegration
 - Knowledge of various types of implants and
 - surgical procedure to place implants.
8. Diseases of the maxillary sinus
- Surgical anatomy of the sinus.
- Sinusitis both acute and chronic
- Surgical approach of sinus - Caldwell-Luc procedure
- Removal of root from the sinus.
- Oro-antral fistula - aetiology, clinical features and various surgical methods for closure.
9. Disorders of T.M. Joint
- Applied surgical anatomy of the joint.
- Dislocation - Types, aetiology, clinical features and management.
- Ankylosis - Definition, aetiology, clinical features and management
- Myo-facial pain dysfunction syndrome, aetiology, clinical features, management- Non surgical and surgical.

- Internal derangement of the joint.
Arthritis of T.M. Joint.
10. Infections of the Oral cavity
Introduction, factors responsible for infection, course of odontogenic infections, spread of odontogenic infections through various facial spaces.
Dento-alveolar abscess - aetiology, clinical features and management.
Osteomyelitis of the jaws - definition, aetiology, pre-disposing factors, classification, clinical features and management.
Ludwigs angina - definition, aetiology, clinical features, management and complications.
 11. Benign cystic lesions of the jaws -
Definition, classification, pathogenesis.
Diagnosis - Clinical features, radiological, aspiration biopsy, use of contrast media and histopathology.
Management - Types of surgical procedures, Rationale of the techniques, indications, procedures, complications etc.
 12. Tumours of the Oral cavity -
General considerations
Non odontogenetic benign tumours occurring in oral cavity - fibroma, papilloma, lipoma, ossifying fibroma, myxoma etc.
Ameloblastoma - Clinical features, radiological appearance and methods of management.
Carcinoma of the oral cavity -
Biopsy - types
TNM classification.
Outline of management of squamous
Cell carcinoma: surgery, radiation and chemotherapy
Role of dental surgeons in the prevention and early detection of oral cancer.
 13. Fractures of the jaws -
General considerations, types of fractures, aetiology, clinical features and general principles of management.
mandibular fractures - Applied anatomy, classification.
Diagnosis - Clinical and radiological
Management - Reduction closed and open
Fixation and immobilisation methods
Outline of rigid and semi-rigid internal fixation.
Fractures of the condyle - aetiology, classification, clinical features, principles of management.
Fractures of the middle third of the face.
Definition of the mid face, applied surgical anatomy, classification, clinical features and outline of management.
Alveolar fractures - methods of management
Fractures of the Zygomatic complex
Classification, clinical features, indications for treatment, various methods of reduction and fixation.
Complications of fractures - delayed union, non-union and malunion.
 14. Salivary gland diseases -
Diagnosis of salivary gland diseases'
Sialography, contrast media, procedure.
Infections of the salivary glands
Sialolithiasis - Sub mandibular duct and gland and parotid duct.
Clinical features, management.
Salivary fistulae
Common tumours of salivary glands like Pleomorphic adenoma including minor salivary glands.
 15. Jaw deformities -
Basic forms - Prognathism, Retrognathism and open bite.
Reasons for correction.
Outline of surgical methods carried out on mandible and maxilla.
 16. Neurological disorders -
Trigeminal neuralgia - definition, aetiology, clinical features and methods of management including surgical.
Facial paralysis - Aetiology, clinical features.
Nerve injuries - Classification, neurorrhaphy etc.
 17. Cleft Lip and Palate -
Aetiology of the clefts, incidence, classification, role of dental surgeon in the management of cleft patients. Outline of the closure procedures.
 18. Medical Emergencies in dental practice -

- Primary care of medical emergencies in dental practice particularly -
 (a) Cardio vascular (b) Respiratory (c) Endocrine
 (d) Anaphylactic reaction (e) Epilepsy (f) Epilepsy
19. Emergency drugs & Intra muscular I.V. Injections -
 Applied anatomy, Ideal location for giving these injections, techniques etc.
 20. Oral Implantology
 21. Ethics

LOCAL ANAESTHESIA:

Introduction, concept of L.A., classification of local anaesthetic agents, ideal requirements, mode of action, types of local anaesthesia, complications.

- Use of Vaso constrictors in local anaesthetic solution -
- Advantages, contra-indications, various vaso constrictors used.
- Anaesthesia of the mandible -
- Pterygomandibular space - boundaries, contents etc.
- Interior Dental Nerve Block - various techniques
- Complications
- Mental foramen nerve block
- Anaesthesia of Maxilla -
- Intra - orbital nerve block.
- Posterior superior alveolar nerve block
- Maxillary nerve block - techniques.

GENERAL ANAESTHESIA –

- Concept of general anaesthesia.
- Indications of general anaesthesia in dentistry.
- Pre-anaesthetic evaluation of the patient.
- Pre-anaesthetic medication - advantages, drugs used.
- Commonly used anaesthetic agents.
- Complication during and after G.A.
- I.V. sedation with Diazepam and Medazolam.
- Indications, mode of action, technique etc.
- Cardiopulmonary resuscitation
- Use of oxygen and emergency drugs.
- Tracheostomy.

RECOMMENDED BOOKS:

1. Impacted teeth; Alling John F & etal.
2. Principles of oral and maxillofacial surgery; Vol. 1,2 & 3 Peterson LJ & etal.
3. Text book of oral and maxillofacial surgery; Srinivasan B.
4. Handbook of medical emergencies in the dental office, Malamed SF.
5. Killeys Fractures of the mandible; Banks P.
6. Killeys fractures of the middle 3rd of the facial skeleton; Banks P.
7. The maxillary sinus and its dental implications; McGovanda
8. Killey and Kays outline of oral surgery – Part-1; Seward GR & etal
9. Essentials of safe dentistry for the medically compromised patients; Mc Carthy FM
10. Oral & maxillofacial surgery, Vol 2; Laskin DM
11. Extraction of teeth; Howe, GL
12. Minor Oral Surgery; Howe. GL
13. Contemporary oral and maxillofacial surgery; Peterson I.J. & EA
14. Oral and maxillofacial infections; Topazian RG & Goldberg MH

13. ORAL MEDICINE AND RADIOLOGY

AIMS:

- (1) To train the students to diagnose the common disorders of Orofacial region by clinical examination and with the help of such investigations as may be required and medical management of oro-facial disorders with drugs and physical agents.
 - (2) To train the students about the importance, role, use and techniques of radiographs/digital radiograph and other imaging methods in diagnosis.
 - (3) The principles of the clinical and radiographic aspects of Forensic Odontology.
- The syllabus in ORAL MEDICINE & RADIOLOGY is divided into two main parts.
 (I) Diagnosis, Diagnostic methods and Oral Medicine (II) Oral Radiology. Again the part ONE is subdivided into three sections. (A) Diagnostic methods (B) Diagnosis and differential diagnosis (C) Oral Medicine & Therapeutics.

COURSE CONTENT

- (1) Emphasis should be laid on oral manifestations of systemic diseases and ill-effects of oral sepsis on general health.
- (2) To avoid confusion regarding which lesion and to what extent the student should learn and know, this elaborate syllabus is prepared. As certain lesions come under more than one group, there is repetition.

Part-I ORAL MEDICINE AND DIAGNOSTIC AIDS

SECTION (A) – DIAGNOSTIC METHODS.

- (1) Definition and importance of Diagnosis and various types of diagnosis
- (2) Method of clinical examinations.
 - (a) General Physical examination by inspection.
 - (b) Oro-facial region by inspection, palpation and other means
 - (c) To train the students about the importance, role, use of saliva and techniques of diagnosis of saliva as part of oral disease
 - (d) Examination of lesions like swellings, ulcers, erosions, sinus, fistula, growths, pigmented lesions, white and red patches
 - (e) Examination of lymph nodes
 - (f) Forensic examination – Procedures for post-mortem dental examination; maintaining dental records and their use in dental practice and post-mortem identification; jurisprudence and ethics.
- (3) Investigations
 - (a) Biopsy and exfoliative cytology
 - (b) Hematological, Microbiological and other tests and investigations necessary for diagnosis and prognosis

SECTION (B) – DIAGNOSIS, DIFFERENTIAL DIAGNOSIS

While learning the following chapters, emphasis shall be given only on diagnostic aspects including differential diagnosis

- (1) Teeth: Developmental abnormalities, causes of destruction of teeth and their sequelae and discoloration of teeth
- (2) Diseases of bone and Osteodystrophies: Development disorders: Anomalies, Exostosis and tori, infantile cortical hyperostosis, osteogenesis imperfecta, Marfans syndrome, osteopetrosis. Inflammation – Injury, infection and spread of infection, fascial space infections, osteoradionecrosis. Metabolic disorders – Histiocytosis
Endocrine – Acro-megaly and hyperparathyroidism
Miscellaneous – Paget's disease, Mono and polyostotic fibrous dysplasia, Cherubism.
- (3) Temporomandibular joint: Developmental abnormalities of the condyle. Rheumatoid arthritis, Osteoarthritis, Sub-luxation and luxation.
- (4) Common cysts and Tumors:
CYSTS: Cysts of soft tissue: Mucocele and Ranula
Cysts of bone: Odontogenic and nonodontogenic.

TUMORS:

Soft Tissue:

Epithelial: Papilloma, Carcinoma, Melanoma

Connective tissue: Fibroma, Lipoma, Fibrosarcoma

Vascular: Haemangioma, Lymphangioma

Nerve Tissue: Neurofibroma, Traumatic Neuroma, Neurofibromatosis

Salivary Glands: Pleomorphic adenoma, Adenocarcinoma, Warthin's Tumor, Adenoid cystic carcinoma.

Hard Tissue:

Non Odontogenic: Osteoma, Osteosarcoma, Osteoclastoma, Chondroma, Chondrosarcoma, Central giant cell tumor, and Central haemangioma

Odontogenic: Enameloma, Ameloblastoma, Calcifying Epithelial Odontogenic tumor, Adenomatoid Odontogenic tumor, Periapical cemental dysplasia and odontomas

- (5) Periodontal diseases: Gingival hyperplasia, gingivitis, periodontitis, pyogenic granuloma
- (6) Granulomatous diseases: Tuberculosis, Sarcoidosis, Midline lethal granuloma, Crohn's Disease and Histiocytosis X
- (7) Miscellaneous Disorders: Burkitt lymphoma, sturge – Weber syndrome, CREST syndrome, Rendu-Osler-Weber disease

SECTION (C): ORAL MEDICINE AND THERAPEUTICS.

The following chapters shall be studied in detail including the etiology, pathogenesis, clinical features, investigations, differential diagnosis, management and prevention

- (1) Infections of oral and paraoral structures:
 - Bacterial: Streptococcal, tuberculosis, syphilis, Vincent's, leprosy, actinomycosis, diphtheria and tetanus
 - Fungal: Candida albicans
 - Virus: Herpes simplex, herpes zoster, Ramsay Hunt syndrome, measles, herpangina, mumps, infectious mononucleosis, AIDS and hepatitis-B
- (2) Important common mucosal lesions:
 - White lesions: Chemical burns, leukoedema, leukoplakia, Fordyce spots, stomatitis nicotina palatinus, white sponge nevus, candidiasis, lichen planus, discoid lupus erythematosus
 - Vesiculo-bullous lesions: Herpes simplex, herpes zoster, herpangina, bullous lichen planus, pemphigus, cicatricial pemphigoid erythema multiforme.
 - Ulcers: Acute and chronic ulcers
 - Pigmented lesions: Exogenous and endogenous

Red lesions: Erythroplakia, stomatitis venenata and medicamentosa, erosive lesions and denture sore mouth.

- (3) Cervico-facial lymphadenopathy
- (4) Facial pain:
 - (i) Organic pain: Pain arising from the diseases of orofacial tissues like teeth, pulp, gingival, periodontal tissue, mucosa, tongue, muscles, blood vessels, lymph tissue, bone, paranasal sinus, salivary glands etc.,
 - (ii) Pain arising due to C.N.S. diseases:
 - (a) Pain due to intracranial and extracranial involvement of cranial nerves. (Multiple sclerosis, cerebrovascular diseases, trojter's syndrome etc.)
 - (b) Neuralgic pain due to unknown causes: Trigeminal neuralgia, glossopharyngeal neuralgia, sphenopalatine ganglion neuralgia, periodic migrainous neuralgia and atypical facial pain
 - (iii) Referred pain: Pain arising from distant tissues like heart, spine etc.,
- (5) Altered sensations: Cacogeusia, halitosis
- (6) Tongue in local and systemic disorders: (Aglossia, ankyloglossia, bifid tongue, fissured tongue, scrotal tongue, macroglossia, microglossia, geographic tongue, median rhomboid glossitis, depapillation of tongue, hairy tongue, atrophic tongue, reactive lymphoid hyperplasia, glossodynia, glossopyrosis, ulcers, white and red patches etc.)
- (7) Oral manifestations of:
 - (i) Metabolic disorders:
 - (a) Porphyria
 - (b) Haemochromatosis
 - (c) Histocytosis X diseases
 - (ii) Endocrine disorders:
 - (a) Pituitary: Gigantism, acromegaly, hypopituitarism
 - (b) Adrenal cortex: Addison's disease (Hypofuntion) Cushing's syndrome (Hyperfunction)
 - (c) Parathyroid glands: Hyperparathyroidism.
 - (d) Thyroid gland: (Hypothyroidism) Cretinism, myxedema
 - (e) Pancreas: Diabetes
 - (iii) Nutritional deficiency: Vitamins: riboflavin, nicotinic acid, folic acid Vitamin B12, Vitamin C (Scurvy)
 - (iv) Blood disorders:
 - (a) Red blood cell diseases
 - Defficiency anemias: (Iron deficiency, plummer – vinson syndrome, pernicious anemia)
 - Haemolytic anemias: (Thalassemia, sickle cell anemia, erythroblastosis fetalis)
 - Aplastic anemia
 - Polycythemia
 - (b) White Blood cell diseases
 - Neutropenia, cyclic neutropenia, agranulocytosis, infectious mononeucleosis and leukemias
 - (c) Haemorrhagic disorders:
 - Thrombocytopenia, purpura, hemophillia, christmas disease and von willebrand's disease
- (8) Disease of salivary glands:
 - (i) Development distrubances: Aplasia, atresia and aberration
 - (ii) Functional disturbances: Xerostomia, ptyalism
 - (iii) Inflammatory conditions: Nonspecific sialadenitis, mumps, sarcoidosis heerdfort's syndrome (Uveoparotid fever), Necrotising sialometaplasia
 - (iv) Cysts and tumors: Mucocele, ranula, pleomorphic adenoma, mucoepidermoid carcinoma
 - (v) Miscellaneous: Sialolithiasis, sjogren's syndrome, mikuliez's disease and sialosis
- (9) Dermatological diseases with oral manifestations:
 - (a) Ectodermal dysplasia (b) Hyperkerotosis palmarplantaris with periodontOopathy (c) Scleroderma (d) Lichen planus including ginspan's syndrome (e) Luplus erythematosus (f) Pemphigus (g) Erythema multiforme (h) Psoriasis
- (10) Immunological diseases with oral manifestations
 - (a) Leukemia (b) Lymphomas (c) Multiple mycloma (d) AIDS clinical manifestations, opportunistic infections, neoplasms (e) Thrombcytopenia (f) Lupus erythematosus (g) Scleroderma (h) dermatomyositis (l) Submucous fibrosis (j) Rhemtoid arthritis (k) Recurrent oral ulcerations including behcet's syndrome and reiter's syndrome
- (11) Allergy: Local allergic reactions, anaphylaxis, serum sickness (local and systemic allergic manifestations to food drugs and chemicals)
- (12) Foci of oral infection and their ill effects on general health
- (13) Management of dental problems in medically comrpomised persons:
 - (i) Physiological changes: Puberty, pregnancy and menopause
 - (ii) The patients suffering with cardiac, respiratory, liver, kidney and bleeding disorders, hypertension, diabetes and AIDS. Post-irradiated patients.
- (14) Precancerous lesions and conditions
- (15) Nerve and muscle diseases:

- (i) Nerves: (a) Neuropraxia (b) Neurotmesis (c) Neuritis (d) Facial nerve paralysis including Bell's palsy, Heerfordt's syndrome, Melkersson Rosenthal syndrome and Ramsay Hunt syndrome (e) Neuroma (f) Neurofibromatosis (g) Frey's syndrome
- (ii) Muscles: (a) Myositis ossificans (b) Myofascial pain dysfunction syndrome (c) Trismus
- (16) Forensic odontology:
- Medicolegal aspects of orofacial injuries
 - Identification of bite marks
 - Determination of age and sex
 - Identification of cadavers by dental appliances, Restorations and tissue remnants
- (17) Therapeutics: General therapeutic measures – drugs commonly used in oral medicine viz., antibiotics, chemotherapeutic agents, anti-inflammatory and analgesic drugs, astringents, mouth washes, styptics, demulcents, local surface anaesthetic, sialogogues, antisialogogues and drugs used in the treatment of malignancy

Part – II BEHAVIOURAL SCIENCES AND ETHICS.

Part – III ORAL RADIOLOGY

- Scope of the subject and history of origin
- Physics of radiation: (a) Nature and types of radiations (b) Source of radiations (c) Production of X-rays (d) Properties of X-rays (e) Compton effect (f) Photoelectric effect (g) Radiation measuring units
- Biological effects of radiation
- Radiation safety and protection measures
- Principles of image production
- Radiographic techniques:
 - Intra-Oral: (a) Periapical radiographs (Bisecting and parallel techniques) (b) Bite wing radiographs (c) Occlusal radiographs
 - Extra-oral: (a) Lateral projections of skull and jaw bones and paranasal sinuses (c) Cephalograms (d) Orthopantomograph (e) Projections of temporomandibular joint and condyle of mandible (f) Projections for Zygomatic arches
 - Specialised techniques: (a) Sialography (b) Xeroradiography (c) Tomography
- Factors in production of good radiographs:
 - K.V.P. and mA. of X-ray machine (b) Filters (c) Collimations (d) Intensifying screens (e) Grids (f) X-ray films (g) Exposure time (h) Techniques (i) Dark room (j) Developer and fixer solutions (k) Film processing
- Radiographic normal anatomical landmarks
- Facility radiographs and artefacts in radiographs
- Interpretation of radiographs in various abnormalities of teeth, bones and other orofacial tissues
- Principles of radiotherapy of oro-facial malignancies and complications of radiotherapy
- Contrast radiography and basic knowledge of radio-active isotopes
- Radiography in Forensic Odontology - Radiographic age estimation and post-mortem radiographic methods

PRACTICALS / CLINICALS:

- Student is trained to arrive at proper diagnosis by following a scientific and systematic procedure of history taking and examination of the orofacial region. Training is also imparted in management wherever possible. Training also shall be imparted on saliva diagnostic procedures. Training also shall be imparted in various radiographic procedures and interpretation of radiographs.
- In view of the above each student shall maintain a record of work done, which shall be evaluated for marks at the time of university examination
- The following is the minimum of prescribed work for recording
 - Recording of detailed case histories of interesting cases 10
 - Intra-oral radiographs (Periapical, bitewing, occlusal) 25
 - Saliva diagnostic check as routine procedure

BOOKS RECOMMENDED:

- Oral Diagnosis, Oral Medicine & Oral Pathology
 - Burkit – Oral Medicine – J.B. Lippincott Company
 - Coleman – Principles of Oral Diagnosis – Mosby Year Book
 - Jones – Oral Manifestations of Systemic Diseases – W.B. Saunders company
 - Mitchell – Oral Diagnosis & Oral Medicine
 - Kerr – Oral Diagnosis
 - Miller – Oral Diagnosis & Treatment
 - Hutchinson – clinical Methods
 - Oral Pathology – Shafers
 - Sonis.S.T., Fazio.R.C. and Fang.L - Principles and practice of Oral Medicine
- Oral Radiology
 - White & Goaz – Oral Radiology – Mosby year Book
 - Wehrman – Dental Radiology – C.V. Mosby Company
 - Stafne – Oral Roentgenographic Diagnosis – W.B.Saunders Co.,

c) Forensic Odontology

1. Derek H. Clark – Practical Forensic Odontology - Butterworth-Heinemann (1992)
2. C Michael Bowers, Gary Bell – Manual of Forensic Odontology - Forensic Pr (1995)

14. ORTHODONTICS & DENTAL ORTHOPAEDICSCOURSE OBJECTIVE:

Undergraduate programme in Orthodontics is designed to enable the qualifying dental surgeon to diagnose, analyse and treat common orthodontic problems by preventive, interceptive and corrective orthodontic procedures. The following basic instructional procedures will be adapted to achieve the above objectives.

1. Introduction, Definition, Historical Background, Aims And Objectives Of Orthodontics And Need For Orthodontics Care.
2. Growth And Development: In General
 - a. Definition
 - b. Growth spurts and Differential growth
 - c. Factors influencing growth and Development
 - d. Methods of measuring growth
 - e. Growth theories (Genetic, Sicher's, Scott's, Moss's, Petrovics, Multifactorial)
 - f. Genetic and epigenetic factors in growth
 - g. Cephalocaudal gradient in growth.
3. Morphologic Development Of Craniofacial Structures
 - a. Methods of bone growth
 - b. Prenatal growth of craniofacial structures
 - c. Postnatal growth and development of: cranial base, maxilla, mandible, dental arches and occlusion.
4. Functional Development Of Dental Arches And Occlusion
 - a. Factors influencing functional development of dental arches and occlusion.
 - b. Forces of occlusion
 - c. Wolfe's law of transformation of bone
 - d. Trajectories of forces
5. Clinical Application Of Growth And Development
6. Malocclusion - In General
 - a. Concept of normal occlusion
 - b. Definition of malocclusion
 - c. Description of different types of dental, skeletal and functional malocclusion.
7. Classification of Malocclusion

Principle, description, advantages and disadvantages of classification of malocclusion by Angle's, Simon's, Lischer's and Ackerman and Proffitt's.
8. Normal And Abnormal Function Of Stomatognathic System
9. Etiology Of Malocclusion
 - a. Definition, importance, classification, local and general etiological factors.
 - b. Etiology of following different types of malocclusion:
 - 1) Midline diastema
 - 2) Spacing
 - 3) Crowding
 - 4) Cross-Bite: Anterior/Posterior
 - 5) Class III Malocclusion
 - 6) Class II Malocclusion
 - 7) Deep Bite
 - 8) Open bite
10. Diagnosis And Diagnostic Aids
 - a. Definition, Importance and classification of diagnostic aids
 - b. Importance of case history and clinical examination in orthodontics
 - c. Study Models: - Importance and uses - Preparation and preservation of study models
 - d. Importance of intraoral X-rays in orthodontics
 - e. Panoramic radiographs: - Principles, Advantages, disadvantages and uses
 - f. Cephalometrics: Its advantages, disadvantages
 1. Definition
 2. Description and use of cephalostat
 3. Description and uses of anatomical landmarks lines and angles used in cephalometric analysis
 4. Analysis- Steiner's, Down's, Tweed's, Ricket's-E- line
 - g. Electromyography and its uses in orthodontics
 - h. Wrist X-rays and its importance in orthodontics
11. General Principles In Orthodontic Treatment Planning Of Dental And Skeletal Malocclusions
12. Anchorage In Orthodontics - Definition, Classification, Types and Stability Of Anchorage
13. Biomechanical Principles In Orthodontic Tooth Movement
 - a. Different types of tooth movements
 - b. Tissue response to orthodontic force application

- c. Age factor in orthodontic tooth movement
- 14. Preventive Orthodontics
 - a. Definition
 - b. Different procedures undertaken in preventive orthodontics and their limitations.
- 15. Interceptive Orthodontics
 - a. Definition
 - b. Different procedures undertaken in interceptive orthodontics
 - c. Serial extractions: Definition, indications, contra-indication, technique, advantages and disadvantages.
 - d. Role of muscle exercises as an interceptive procedure
- 16. Corrective Orthodontics
 - a. Definition, factors to be considered during treatment planning.
 - b. Model analysis: Pont's, Ashley Howe's, Bolton, Careys, Moyer's Mixed Dentition Analysis
 - c. Methods of gaining space in the arch:- Indications, relative merits and demerits of proximal stripping, arch expansion and extractions
 - d. Extractions in Orthodontics - indications and selection of teeth for extraction.
- 17. Orthodontic Appliances: General
 - a. Requisites for orthodontic appliances
 - b. Classification, indications of Removable and Functional Appliances
 - c. Methods of force application
 - d. Materials used in construction of various orthodontic appliances - uses of stainless steel, technical considerations in curing of acrylic, Principles of welding and soldering, fluxes and antfluxes.
 - e. Preliminary knowledge of acid etching and direct bonding.
- 18. Ethics

REMOVABLE ORTHODONTIC APPLIANCES

- 1) Components of removable appliances
- 2) Different types of clasps and their uses
- 3) Different types of labial bows and their uses
- 4) Different types of springs and their uses
- 5) Expansion appliances in orthodontics:
 - i) Principles
 - ii) Indications for arch expansion
 - iii) Description of expansion appliances and different types of expansion devices and their uses.
 - iv) Rapid maxillary expansion

FIXED ORTHODONTIC APPLIANCES

1. Definition, Indications & Contraindications
2. Component parts and their uses
3. Basic principles of different techniques: Edgewise, Begg's, straight wire.

EXTRAORAL APPLIANCES

1. Headgears
2. chin cup
3. reverse pull headgears

MYOFUNCTIONAL APPLIANCES

1. Definition and principles
2. Muscle exercises and their uses in orthodontics
3. Functional appliances:
 - i) Activator, Oral screens, Frankels function regulator, bionator twin blocks, lip bumper
 - ii) Inclined planes - upper and lower
18. Orthodontic Management Of Cleft Lip And Palate
19. Principles Of Surgical Orthodontics

Brief knowledge of correction of:

 - a. Mandibular Prognathism and Retrognathism
 - b. Maxillary Prognathism and Retrognathism
 - c. Anterior open bite and deep bite
 - d. Cross bite
20. Principle, Differential Diagnosis & Methods Of Treatment Of:
 1. Midline diastema
 2. Cross bite
 3. Open bite
 4. Deep bite
 5. Spacing
 6. Crowding
 7. Class II - Division 1, Division 2
 8. Class III Malocclusion - True and Pseudo Class III

21. Retention And Relapse

Definition, Need for retention, Causes of relapse, Methods of retention, Different types of retention devices, Duration of retention, Theories of retention.

CLINICALS AND PRACTICALS IN ORTHODONTICS

PRACTICAL TRAINING DURING II YEAR B.D.S.

- I. Basic wire bending exercises Gauge 22 or 0.7mm
 1. Straightening of wires (4 Nos.)
 2. Bending of a equilateral triangle
 3. Bending of a rectangle
 4. Bending of a square
 5. Bending of a circle
 6. Bending of U.V.
- II. Construction of Clasps (Both sides upper/lower) Gauge 22 or 0.7mm
 1. 3/4 Clasp (C-Clasp)
 2. Full Clasp (Jackson's Crib)
 3. Adam's Clasp
 4. Triangular Clasp
- III. Construction of Springs (on upper both sides) Gauge 24 or 0.5mm
 1. Finger Spring
 2. Single Cantelever Spring
 3. Double Cantelever Spring (Z-Spring)
 4. T-Springs on premolars
- IV. Construction of Canine retractors Gauge 23 or 0.6mm
 1. U - Loop canine retractor
(Both sides on upper & lower)
 2. Helical canine retractor
(Both sides on upper & lower)
 3. Buccal canine retractor:
 - Self supported buccal canine retractor with
 - a) Sleeve - 5mm wire or 24 gauge
 - b) Sleeve - 19 gauge needle on any one side.
 4. Palatal canine retractor on upper both sides
Gauge 23 or 0.6mm
- V. Labial Bow
Gauge 22 or 0.7mm
One on both upper and lower

CLINICAL TRAINING DURING III YEAR B.D.S.

NO. EXERCISE

01. Making upper Alginate impression
02. Making lower Alginate impression
03. Study Model preparation
04. Model Analysis
 - a. Pont's Analysis
 - b. Ashley Howe's Analysis
 - c. Carey's Analysis
 - d. Bolton's Analysis
 - e. Moyer's Mixed Dentition Analysis

CLINICAL TRAINING DURING FINAL YEAR B.D.S.

NO. EXERCISE

01. Case History taking
02. Case discussion
03. Discussion on the given topic
04. Cephalometric tracings
 - a. Down's Analysis
 - b. Steiner's Analysis
 - c. Tweed's Analysis

PRACTICAL TRAINING DURING FINAL YEAR B.D.S.

1. Adam's Clasp on Anterior teeth Gauge 0.7mm
 2. Modified Adam's Clasp on upper arch Gauge 0.7mm
 3. High Labial bow with Apron spring on upper arch
(Gauge of Labial bow - 0.9mm, Apron spring - 0.3mm)
 4. Coffin spring on upper arch Gauge 1mm
- Appliance Construction in Acrylic
1. Upper & Lower Hawley's Appliance
 2. Upper Hawley's with Anterior bite plane
 3. Upper Habit breaking Appliance

4. Upper Hawley's with Posterior bite plane with 'Z' Spring
5. Construction of Activator
6. Lower inclined plane/Catalan's Appliance
7. Upper Expansion plate with Expansion Screw

RECOMMENDED AND REFERENCE BOOKS

- | | |
|--|--------------------|
| 1. CONTEMPORARY ORTHODONTICS | WILLIAM R. PROFFIT |
| 2. ORTHODONTICS FOR DENTAL STUDENTS | WHITE and GARDINER |
| 3. HANDBOOK OF ORTHODONTICS | MOYERS |
| 4. ORTHODONTICS - PRINCIPLES AND PRACTICE | GRABER |
| 5. DESIGN, CONSTRUCTION AND USE OF REMOVABLE | |
| 6. ORTHODONTIC APPLIANCES | C. PHILIP ADAMS |
| 7. CLINICAL ORTHODONTICS: VOL1 & 2 | SALZMANN |

15. PAEDIATRIC & PREVENTIVE DENTISTRY

THEORY:

1. INTRODUCTION TO PEDODONTICS & PREVENTIVE DENTISTRY.
 - Definition, Scope, Objectives and Importance.
2. GROWTH & DEVELOPMENT:
 - Importance of study of growth and development in Pedodontics.
 - Prenatal and Postnatal factors in growth & development.
 - Theories of growth & development.
 - Development of maxilla and mandible and related age changes.
3. DEVELOPMENT OF OCCLUSION FROM BIRTH THROUGH ADOLESCENCE.
 - Study of variations and abnormalities.
4. DENTAL ANATOMY AND HISTOLOGY:
 - Development of teeth and associated structures.
 - Eruption and shedding of teeth.
 - Teething disorders and their management.
 - Chronology of eruption of teeth.
 - Differences between deciduous and permanent teeth.
 - Development of dentition from birth to adolescence.
 - Importance of first permanent molar.
5. DENTAL RADIOLOGY RELATED TO PEDODONTICS.
6. ORAL SURGICAL PROCEDURES IN CHILDREN.
 - Indications and contraindications of extractions of primary and permanent teeth in children.
 - Knowledge of Local and General Anesthesia.
 - Minor surgical procedures in children.
7. DENTAL CARIES:
 - Historical background.
 - Definition, aetiology & pathogenesis.
 - Caries pattern in primary, young permanent and permanent teeth in children.
 - Rampant caries, early childhood caries and extensive caries:
 - * Definition, aetiology, Pathogenesis, Clinical features, Complications & Management
 - Role of diet and nutrition in Dental Caries.
 - Dietary modifications & Diet counseling.
 - Caries activity, tests, caries prediction, caries susceptibility & their clinical application.
8. GINGIVAL & PERIODONTAL DISEASES IN CHILDREN.
 - Normal gingiva & periodontium in children.
 - Definition, aetiology & Pathogenesis.
 - Prevention & Management of gingival & Periodontal diseases.
9. CHILD PSYCHOLOGY:
 - Definition.
 - Theories of child psychology.
 - Psychological development of children with age.
 - Principles of psychological growth & development while managing child patient.
 - Dental fear and its management.
 - Factors affecting child's reaction to dental treatment.
10. BEHAVIOUR MANAGEMENT:
 - Definitions.
 - Types of behaviour encountered in the dental clinic.
 - Non-pharmacological & pharmacological methods of Behaviour Management.
11. PEDIATRIC OPERATIVE DENTISTRY:
 - Principles of Pediatric Operative Dentistry.
 - Modifications required for cavity preparation in primary and young permanent teeth.
 - Various Isolation Techniques.
 - Restorations of decayed primary, young permanent and permanent teeth in children using various restorative materials like Glass Ionomer, Composites & Silver Amalgam. Stainless steel, Polycarbonate & Resin Crowns.

12. PEDIATRIC ENDODONTICS

- Principles & Diagnosis.
- Classification of Pulpal Pathology in primary, young permanent & permanent teeth.
- Management of Pulpally involved primary, young permanent & permanent teeth.
 - Pulp capping – direct & indirect.
 - Pulpotomy
 - Pulpectomy
 - Apexogenesis
 - Apexification
- Obturation Techniques & material used for primary, young permanent & Permanent teeth in children.

13. TRAUMATIC INJURIES IN CHILDREN:

- Classifications & Importance.
- Sequelae & reaction of teeth to trauma.
- Management of Traumatized teeth.

14. PREVENTIVE & INTERCEPTIVE ORTHODONTICS:

- Definitions.
- Problems encountered during primary and mixed dentition phases & their management.
- Serial extractions.
- Space management.

15. ORAL HABITS IN CHILDREN:

- Definition, Aetiology & Classification.
- Clinical features of digit sucking, tongue thrusting, mouth breathing & various other secondary habits.
- Management of oral habits in children.

16. DENTAL CARE OF CHILDREN WITH SPECIAL NEEDS:

- Definition, Aetiology, Classification, Behavioural and Clinical features & Management of children with:
 - Physically handicapping conditions.
 - Mentally compromising conditions.
 - Medically compromising conditions.
 - Genetic disorders.

17. CONGENITAL ABNORMALITIES IN CHILDREN:

- Definition, Classification, Clinical features & Management.

18. DENTAL EMERGENCIES IN CHILDREN & THEIR MANAGEMENT.

19. DENTAL MATERIALS USED IN PEDIATRIC DENTISTRY.

20. PREVENTIVE DENTISTRY:

- Definition.
- Principles & Scope.
- Types of prevention.
- Different preventive measures used in Pediatric Dentistry including pit and fissure sealants and caries vaccine.

21. DENTAL HEALTH EDUCATION & SCHOOL DENTAL HEALTH PROGRAMMES.

22. FLUORIDES:

- Historical background.
- Systemic & Topical fluorides.
- Mechanism of action.
- Toxicity & Management.
- Defluoridation techniques.

23. CASE HISTORY RECORDING:

- Outline of principles of examination, diagnosis & treatment planning.

24. SETTING UP OF PEDIATRIC DENTISTRY CLINIC.

25. ETHICS.

B. PRACTICALS:

Following is the recommended clinical quota for under-graduate students in the subject of pediatric & preventive dentistry.

1. Restorations – Class I & II only : 45
2. Preventive measures e.g. Oral Prophylaxis – 20.
3. Fluoride applications – 10
4. Extractions – 25
5. Case History Recording & Treatment Planning – 10
6. Education & motivation of the patients using disclosing agents. Educating patients about oral hygiene measures like tooth brushing, flossing etc.

BOOKS RECOMMENDED & REFERENCE:

1. Pediatric Dentistry (Infancy through Adolescence) – Pinkham.
2. Kennedy's Pediatric Operative Dentistry – Kennedy & Curzon.
3. Occlusal guidance in Pediatric Dentistry – Stephen H. Wei.
4. Clinical Use of Fluorides – Stephen H. Wei.

5. Pediatric Oral & Maxillofacial Surgery – Kaban.
6. Pediatric Medical Emergencies – P. S. Whatt.
7. Understanding of Dental Caries – Niki Foruk.
8. An Atlas of Glass Ionomer cements – G. J. Mount.
9. Clinical Pedodontics – Finn.
10. Textbook of Pediatric Dentistry – Braham Morris.
11. Primary Preventive Dentistry – Norman O. Harris.
12. Handbook of Clinical Pedodontics – Kenneth. D.
13. Preventive Dentistry – Forrester.
14. The Metabolism and Toxicity of Fluoride – Garry M. Whitford.
15. Dentistry for the Child and Adolescence – Mc. Donald.
16. Pediatric Dentistry – Damle S. G.
17. Behaviour Management – Wright
18. Pediatric Dentistry – Mathewson.
19. Traumatic Injuries – andreason.
20. Occlusal guidance in Pediatric Dentistry – Nakata.
21. Pediatric Drug Therapy – Tomare
22. Contemporary Orthodontics – Profitt..
23. Preventive Dentistry – Depaola.
24. Metabolism & Toxicity of Fluoride – whitford. G. M.
25. Endodontic Practice – Grossman.
26. Principles of Endodontics – Munford.
27. Endodontics – Ingle.
28. Pathways of Pulp – Cohen.
29. Management of Traumatized anterior Teeth – Hargreaves.

16. PUBLIC HEALTH DENTISTRY

GOAL:

To prevent and control oral diseases and promote oral health through organized community efforts

OBJECTIVES:

Knowledge:

At the conclusion of the course the student shall have a knowledge of the basis of public health, preventive dentistry, public health problems in India, Nutrition, Environment and their role in health, basics of dental statistics, epidemiological methods, National oral health policy with emphasis on oral health policy.

Skill and Attitude:

At the conclusion of the course the students shall have require at the skill of identifying health problems affecting the society, conducting health surveys, conducting health education classes and deciding health strategies. Students should develop a positive attitude towards the problems of the society and must take responsibilities in providing health.

Communication abilities:

At the conclusions of the course the student should be able to communicate the needs of the community efficiently, inform the society of all the recent methodologies in preventing oral disease

Syllabus:

1. Introduction to Dentistry: Definition of Dentistry, History of dentistry, Scope, aims and objectives of Dentistry.
2. Public Health:
 - i. Health & Disease: - Concepts, Philosophy, Definition and Characteristics
 - ii. Public Health: - Definition & Concepts, History of public health
 - iii. General Epidemiology: - Definition, objectives, methods
 - iv. Environmental Health: - Concepts, principles, protection, sources, purification environmental sanitation of water disposal of waste sanitation, then role in mass disorder
 - v. Health Education: - Definition, concepts, principles, methods, and health education aids
 - vi. Public Health Administration: - Priority, establishment, manpower, private practice management, hospital management.
 - vii. Ethics and Jurisprudence: Professional liabilities, negligence, malpractice, consents, evidence, contracts, and methods of identification in forensic dentistry.
 - viii. Nutrition in oral diseases
 - ix. Behavioral science: Definition of sociology, anthropology and psychology and their in dental practice and community.
 - x. Health care delivery system: Center and state, oral health policy, primary health care, national programmes, health organizations.

Dental Public Health:

1. Definition and difference between community and clinical health.
2. Epidemiology of dental diseases-dental caries, periodontal diseases, malocclusion, dental fluorosis and oral cancer.
3. Survey procedures: Planning, implementation and evaluation, WHO oral health survey methods 1997, indices for dental diseases.

4. Delivery of dental care: Dental auxiliaries, operational and non-operational, incremental and comprehensive health care, school dental health.
5. Payments of dental care: Methods of payments and dental insurance, government plans
6. Preventive Dentistry- definition, Levels, role of individual , community and profession, fluorides in dentistry, plaque control programmes.

Research Methodology and Dental Statistics

1. Health Information: - Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes
2. Research Methodology: -Definition, types of research, designing a written protocol
3. Bio-Statistics: - Introduction, collection of data, presentation of data, Measures of Central tendency, measures of dispersion, Tests of significance, Sampling and sampling techniques- types, errors, bias, blind trails and calibration.

Practice Management

1. Place and locality
2. Premises & layout
3. Selection of equipments
4. Maintenance of records/accounts/audit.

Dentist Act 1948 with amendment.

Dental Council of India and State Dental Councils

Composition and responsibilities.

Indian Dental Association

Head Office, State, local and branches.

PRACTICALS/CLINICALS/FIELD PROGEAMME IN COMMUNITY DENTISTRY:

These exercises designed to help the student in IV year students:

1. Understand the community aspects of dentistry
2. To take up leadership role in solving community oral health programme

Exercises:

- a) Collection of statistical data (demographic) on population in India, birth rates, morbidity and mortality, literacy, per capita income
- b) Incidence and prevalence of common oral diseases like dental caries, periodontal disease, oral cancer, fluorosis at national and international levels
- c) Preparation of oral health education material posters, models, slides, lectures, play acting skits etc.
- d) Oral health status assessment of the community using indices and WHO basic oral health survey methods
- e) Exploring and planning setting of private dental clinics in rural, semi urban and urban locations, availment of finances for dental practices-preparing project report.
- f) Visit to primary health center-to acquaint with activities and primary health care delivery
- g) Visit to water purification plant/public health laboratory/ center for treatment of western and sewage water
- h) Visit to schools-to assess the oral health status of school children, emergency treatment and health education including possible preventive care at school (tooth brushing technique demonstration and oral rinse programme etc.)
- i) Visit to institution for the care of handicapped, physically, mentally, or medically compromised patients
- j) Preventive dentistry: in the department application of pit and fissure sealants, fluoride gel application procedure, A. R. T., Comprehensive health for 5 pts at least 2 patients

The colleges are encouraged to involve in the N.S.S. programme for college students for carrying out social work in rural areas

SUGGESTED INTERNSHIP PROGRAMME IN COMMUNITY DENTISTRY:

I. AT THE COLLEGE:

Students are posted to the department to get training in dental practice management.

- (a) Total oral health care approach- in order to prepare the new graduates in their approach to diagnosis, treatment planning, cost of treatment, prevention of treatment on schedule, recall maintenance of records etc. at least 10 patients (both children and adults of all types posting for at least one month).
- (b) The practice of chair side preventive dentistry including oral health education

II. AT THE COMMUNITY ORAL HEALTH CARE CENTRE (ADOPTED BY THE DENTAL COLLEGE IN RURAL AREAS)

Graduates posted for at least on month to familiarize in:

- (a) Survey methods, analysis and presentation of oral health assessment of school children and community independently using WHO basic oral health survey methods.
- (b) Participation in rural oral health education programmes
- (c) Stay in the village to understand the problems and life in rural areas

III. DESIRABLE: Learning use of computers-at least basic programme.

Examination Pattern

- I. Index: Case History

- b) Oral hygiene indices simplified- Green and Vermilion
 - c) Silness and Loe index for Plaque
 - d) Loe and Silness index for gingival
 - e) CPI
 - f) DMF: T and S, df:t and s
 - g) Deans fluoride index
- II. Health Education
 - 1. Make one - Audio visual aid
 - 2. Make a health talk
 - III. Practical work
 - 1. Pit and fissure sealant
 - 2. Topical fluoride application

BOOKS RECOMMENDED & REFERENCE:

1. Dentistry Dental Practice and Community by David F. Striffler and Brain A. Burt, Edn. –1983, W. B. Saunders Company
2. Principles of Dental Public Health by James Morse Dunning, IVth Edition, 1986, Harward University Press.
3. Dental Public Health and Community Dentistry Ed by Anthony Jong Publication by The C. V. Mosby Company 1981
4. Community Oral Health-A system approach by Patricia P. Cormier and Joyce I. Levy published by Appleton-Century-Crofts/New York, 1981
5. Community Dentistry-A problem oriented approach by P. C. Dental Hand book series Vol.8 by Stephen L. Silverman and Ames F. Tryon, Series editor-Alvin F. Gardner, PSG Publishing company Inc. Littleton Massachuseltts, 1980.
6. Dental Public Health- An Introduction to Community Dentistry. Edition by Geoffrey L. Slack and Brain Burt, Published by John Wriyth and sons Bristol, 1980
7. Oral Health Surveys- Basic Methods, 4th edition, 1997, published by W. H. O. Geneva available at the regional office New Delhi.
8. Preventive Medicine and Hygiene-By Maxcy and Rosenau, published by Appleton Century Crofts, 1986.
9. Preventive Dentistry-by J. O. Forrest published by John Wright and sons Bristol, 1980.
10. Preventive Dentistry by Murray, 1997.
11. Text Book of Preventive and Social Medicine by Park and park, 14th edition.
12. Community Dentistry by Dr. Soben Peter.
13. Introduction to Bio-statistics by B. K. Mahajan
14. Research methodology and Bio-statistics by
15. Introduction to Statistical Methods by Grewal

17. PERIODONTOLOGY

OBJECTIVES:

The student shall acquire the skill to perform dental scaling ,diagnostic tests of periodontal diseases; to use the instruments for periodontal therapy and maintenance of the same.

The student shall develop attitude to impart the preventive measures namely, the prevention of periodontal diseases and prevention of the progress of the disease. The student shall also develop an attitude to perform the treatment with full aseptic precautions; shall develop an attitude to prevent iatrogenic diseases; to conserve the tooth to the maximum possible time by maintaining periodontal health and to refer the patients who require specialist's care.

1. Introduction: Definition of Periodontology, Periodontics, Periodontia, Brief historical background, Scope of Periodontics
2. Development of perio-dontal tissues, micro-structural anatomy and biology of periodontal tissues in detail Gingiva. Junctional epithelium in detail, Epithelial-Mesenchymal interaction,Periodontal, ligament Cementum, Alveolar bone.
3. Defensive mechanisms in the oral cavity: Role of-Epithelium,Gingival fluid, Saliva and other defensive mechanisms in the oral environment.
4. Age changes in periodontal structures and their significance in Geriatric dentistry Age changes in teeth and periodontal structures and their association with periodontal diseases 1
5. Classification of periodontal diseases Need for classification, Scientific basis of classification 1
 Classification of gingival and periodontal diseases as described in World Workshop1989
 Gingivitis:
 Plaque associated,ANUG,steroid hormone influenced, Medication influenced, Desquamative gingivitis, other forms of gingivitis as in nutritional deficiency, bacterial and viral infections etc.

Periodontitis:

Adult periodontitis, Rapidly progressive periodontitis A&B,
 Juvenile periodontitis(localized, generalized, and post-juvenile),
 Prepubertal periodontitis,
 Refractory periodontitis

6. Gingival diseases Localized and generalized gingivitis, Papillary, marginal and diffuse gingivitis 6
 Etiology, pathogenesis, clinical signs, symptoms and management of
 i) Plaque associated gingivitis
 ii) Systemically aggravated gingivitis(sex hormones, drugs and systemic diseases)
 iii) ANUG
 iv) Desquamative gingivitis-Gingivitis associated with lichen planus, pemphigoid, pemphigus, and other vesiculobullous lesions
 v) Allergic gingivitis
 vi) Infective gingivitis-Herpetic, bacterial and candidial
 vii) Pericoronitis
 viii) Gingival enlargement (classification and differential diagnosis)
- 7 Epidemiology of periodontal diseases - Definition of index, incidence, prevalence, epidemiology, endemic, epidemic, and pandemic 2
 - Classification of indices(Irreversible and reversible)
 - Deficiencies of earlier indices used in Periodontics
 - Detailed understanding of Silness & Loe Plaque Index, Loe & Silness Gingival Index, CPITN & CPI.
 - Prevalence of periodontal diseases in India and other countries.
 - Public health significance(All these topics are covered at length under community dentistry. Hence, the topics may be discussed briefly. However, questions may be asked from the topics for examination)
8. Extension of inflammation from gingiva 1
 Mechanism of spread of inflammation from gingival area to deeper periodontal structures
9. Pocket 2
 Definition, signs and symptoms, classification, pathogenesis, histopathology, root surface changes and contents of the pocket
10. Etiology 5
 - Dental Plaque (Biofilm)
 - Definition, New concept of biofilm
 - Types, composition, bacterial colonization, growth, maturation & disclosing agents
 - Role of dental plaque in periodontal diseases
 - Plaque microorganisms in detail and bacteria associated with periodontal diseases
 - Plaque retentive factors
 - Materia alba
 - Food debris
 - Calculus
 - Definition
 - Types, composition, attachment, theories of formation
 - Role of calculus in disease
 Food Impaction
 - Definition
 - Types, Etiology
 - Hirschfelds' classification
 - Signs, symptoms & sequelae of treatment
 Trauma from occlusion
 - Definition, Types
 - Histopathological changes
 - Role in periodontal disease
 - Measures of management in brief
 Habits
 - Their periodontal significance
 - Bruxism & parafunctional habits, tongue thrusting, lip biting, occupational habits
 IATROGENIC FACTORS

	Conservative Dentistry	
	- Restorations	
	- Contact point, marginal ridge, surface roughness, overhanging restorations, interface between restoration and teeth	
	Prosthodontics	
	- Interrelationship	
	- Bridges and other prosthesis, pontics(types) ,surface contour, relationships of margins to the periodontium, Gingival protection theory, muscle action theory& theory of access to oral hygiene.	
	Orthodontics	
	- Interrelationship, removable appliances &fixed appliances	
	- Retention of plaque, bacterial changes	
	Systemic diseases	
	- Diabetes, sex hormones, nutrition(Vit.C &proteins)	
	- AIDS & periodontium	
	- Hemorrhagic diseases, Leukemia, clotting factor disorders,PMN disorders	
11.	Risk factors	Definition. Risk factors for periodontal diseases 1
12.	Host response	- Mechanism of initiation and progression of periodontal diseases 3
		- Basic concepts about cells, Mast cells, neutrophils, macrophages, lymphocytes, immunoglobulins, complement system, immune mechanisms & cytokines in brief
		- Stages in gingivitis-Initial, early, established & advanced
		- Periodontal disease activity, continuous paradigm, random burst & asynchronous multiple burst hypothesis
13.	Periodontitis	- Etiology ,histopathology, clinical signs & symptoms, diagnosis and treatment of adult periodontitis 6
		- Periodontal abscess; definition, classification, pathogenesis, differential diagnosis and treatment
		- Furcation involvement, Glickmans' classification, prognosis and management
		- Rapidly progressive periodontitis
		- Juvenile periodontitis: Localized and generalized
		- Post-juvenile periodontitis
		- Periodontitis associated with systemic diseases
		- Refractory periodontitis
14.	Diagnosis	- Routine procedures, methods of probing, types of probes,(According to case history) 2
		- Halitosis: Etiology and treatment. Mention advanced diagnostic aids and their role in brief.
15.	Prognosis	- Definition, types, purpose and factors to be taken into consideration 1
16.	Treatment plan	- Factors to be considered 1
17.	Periodontal therapy	A. General principles of periodontal therapy. Phase I,II, III, IV therapy. 3
		Definition of periodontal regeneration, repair, new attachment and reattachment.
		B. Plaque control
		i. Mechanical tooth brushes, interdental cleaning aids, dentifrices
		ii. Chemical; classification and mechanism of action of each & pocket irrigation
18.	Pocket eradication procedures	- Scaling and root planing: 5
		- Indications
		- Aims & objectives
		- Healing following root planning
		- Hand instruments, sonic, ultrasonic &piezo-electric scalers
		- Curettage &present concepts
		- Definition
		- Indications
		- Aims &objectives
		- Procedures & healing response
		- Flap surgery
		- Definition
		- Types of flaps, Design of flaps, papilla preservation

		- Indications & contraindications	
		- Armamentarium	
		- Surgical procedure & healing response	
9.	Osseous Surgery	Osseous defects in periodontal disease	2
		- Definition	
		- Classification	
		- Surgery: resective, additive osseous surgery (osseous grafts with classification of grafts)	
		- Healing responses	
		- Other regenerative procedures; root conditioning	
		- Guided tissue regeneration	
20.	Mucogingival surgery & periodontal plastic surgeries	Definition	3
		Mucogingival problems: etiology, classification of gingival recession (P.D. Miller Jr. and Sullivan and Atkins)	
		Indications & objectives	
		Gingival extension procedures: lateral pedicle graft, frenectomy, frenotomy	
		Crown lengthening procedures	
		Periodontal microsurgery in brief	
21.	Splints	- Periodontal splints	1
		- Purpose & classification	
		- Principles of splinting	
22.	Hypersensitivity	Causes, Theories & management	1
23.	Implants	Definition, types, scope & biomaterials used.	1
		Periodontal considerations: such as implant-bone interface, implant-gingiva interface, implant failure, peri-implantitis & management	
24.	Maintenance phase (SPT)	- Aims, objectives, and principles	1
		- Importance	
		- Procedures	
		- Maintenance of implants	
25.	Pharmaco-therapy	- Periodontal dressings	2
		- Antibiotics & anti-inflammatory drugs	
		- Local drug delivery systems	
26.	Periodontal management of medically compromised patients	Topics concerning periodontal management of medically compromised patients	1
27.	Inter-disciplinary care	- Pulpo-periodontal involvement	1
		- Routes of spread of infection	
		- Simons' classification	
		- Management	
28.	Systemic effects of periodontal diseases in brief	Cardiovascular diseases, Low birth weight babies etc.	1
29.	Infection control protocol	Sterilization and various aseptic procedures	1
30.	Ethics		

TUTORIALS DURING CLINICAL POSTING;

1. Infection control
2. Periodontal instruments
3. Chair position and principles of instrumentation
4. Maintenance of instruments (sharpening)
5. Ultrasonic, Piezoelectric and sonic scaling – demonstration of technique
6. Diagnosis of periodontal disease and determination of prognosis
7. Radiographic interpretation and lab investigations
8. Motivation of patients- oral hygiene instructions

Students should be able to record a detailed periodontal case history, determine diagnosis, prognosis and plan treatment. Student should perform scaling, root planning local drug delivery and SPT. Shall be given demonstration of all periodontal surgical procedures.

DEMONSTRATIONS:

1. History taking and clinical examination of the patients
2. Recording different indices
3. Methods of using various scaling and surgical instruments
4. Polishing the teeth
5. Bacterial smear taking
6. Demonstration to patients about different oral hygiene aids

7. Surgical procedures- gingivectomy, gingivoplasty, and flap operations
8. Follow up procedures, post operative care and supervision

REQUIREMENTS:

1. Diagnosis, treatment planning and discussion and total periodontal treatment – 25 cases
2. Dental scaling, oral hygiene instructions – 50 complete cases/ equivalent
3. Assistance in periodontal surgery – 5 cases
4. A work record should be maintained by all the students and should be submitted at the time of examination after due certification from the head of the department.

Students should have to complete the work prescribed by the concerned department from time to time and submit a certified record for evaluation.

PRESCRIBED BOOK:

1. Glickman's Clinical Periodontology — Carranza

REFERENCE BOOKS

1. Essentials of Periodontology and periodontics- Torquil MacPhee
2. Contemporary periodontics- Cohen
3. Periodontal therapy- Goldman
4. Orbans' periodontics- Orban
5. Oral Health Survey- W.H.O.
6. Preventive Periodontics- Young and Stiffler
7. Public Health Dentistry- Slack
8. Advanced Periodontal Disease- John Prichard
9. Preventive Dentistry- Forrest
10. Clinical Periodontology- Jan Lindhe
11. Periodontics- Baer & Morris.

18. PROSTHODONTICS AND CROWN & BRIDGE

Complete Dentures

- A. Applied Anatomy and Physiology.
 1. Introduction
 2. Biomechanics of the edentulous state.
 3. Residual ridge resorption.
- B. Communicating with the patient
 1. Understanding the patients.
 - Mental attitude.
 2. Instructing the patient.
- C. Diagnosis and treatment planning for patients-
 1. With some teeth remaining.
 2. With no teeth remaining.
 - a) Systemic status.
 - b) Local factor.
 - c) The geriatric patient.
 - d) Diagnostic procedures.
- D. Articulators- discussion
- E. Improving the patient's denture foundation and ridge relation -an overview.
 - a) Pre-operative examination.
 - b) Initial hard tissue & soft tissue procedure.
 - c) Secondary hard & soft tissue procedure.
 - d) Implant procedure.
 - e) Congenital deformities.
 - f) Postoperative procedure.
- F. Principles of Retention, Support and Stability
- G. Impressions - detail.
 - a) Muscles of facial expression.
 - b) Biologic considerations for maxillary and mandibular impression including anatomy landmark and their interpretation.
 - c) Impression objectives.
 - d) Impression materials.
 - e) Impression techniques.
 - f) Maxillary and mandibular impression procedures.
 - i. Preliminary impressions.
 - ii. Final impressions.
 - g) Laboratory procedures involved with impression making (Beading & Boxing, and cast preparation).
- H. Record bases and occlusion rims- in detail.
 - a) Materials & techniques.
 - b) Useful guidelines and ideal parameters.
 - c) Recording and transferring bases and occlusal rims.

- I. Biological consideration in jaw relation & jaw movements - craniomandibular relations.
 - a) Mandibular movements.
 - b) Maxillo -mandibular relation including vertical and horizontal jaw relations.
 - c) Concept of occlusion- discuss in brief.
- J. Relating the patient to the articulator.
 - a) Face bow types & uses- discuss in brief.
 - b) Face bow transfer procedure - discuss in brief.
- K. Recording maxillo mandibular relation.
 - a) Vertical relations.
 - b) Centric relation records.
 - c) Eccentric relation records.
 - d) Lateral relation records.
- L. Tooth selection and arrangement.
 - a) Anterior teeth.
 - b) Posterior teeth.
 - c) Esthetic and functional harmony.
- M. Relating inclination of teeth to concept of occlusion- in brief.
 - a) Neurocentric concept.
 - b) Balanced occlusal concept.
- N. Trial dentures.
- O. Laboratory procedures.
 - a) Wax contouring.
 - b) Investing of dentures.
 - c) Preparing of mold.
 - d) Preparing & packing acrylic resin.
 - e) Processing of dentures.
 - f) Recovery of dentures.
 - g) Lab remount procedures.
 - h) Recovering the complete denture from the cast.
 - i) Finishing and polishing the complete denture.
 - j) Plaster cast for clinical denture remount procedure.
- P. Denture insertion.
 - a) Insertion procedures.
 - b) Clinical errors.
 - c) Correcting occlusal disharmony.
 - d) Selective grinding procedures.
- R. Treating problems with associated denture use – discuss in brief (tabulation/flow-chart form).
- S. Treating abused tissues - discuss in brief.
- T. Relining and rebasing of dentures- discuss in brief.
- V. Immediate complete dentures construction procedure- discuss in brief.
- W. The single complete denture- discuss in brief.
- X. Overdentures denture- discuss in brief.
- Y. Dental implants in complete denture - discuss in brief.

Note : It is suggested that the above mentioned topics be dealt with wherever appropriate in the following order so as to cover –

1. Definition
2. Diagnosis (of the particular situation/patient selection/treatment planning)
3. Types / Classification
4. Materials
5. Methodology – Lab /Clinical
6. Advantages & disadvantages
7. Indications, contraindications
8. Maintenance Phase
9. Oral Implantology
10. Ethics

Removable Flexible Dentures

1. Introduction
 - Terminologies and scope
2. Classification.
3. Examination, Diagnosis & Treatment planning & evaluation of diagnostic data.
4. Components of a removable partial denture.
 - Major connectors,
 - minor connectors,
 - Rest and rest seats.
5. Components of a Removable Partial Denture.
 - Direct retainers,
 - Indirect retainers,
 - Tooth replacement.

6. Principles of Removable Partial Denture Design.
7. Survey and design – in brief.
 - Surveyors.
 - Surveying.
 - Designing.
8. Mouth preparation and master cast.
9. Impression materials and procedures for removable partial dentures.
10. Preliminary jaw relation and esthetic try-in for some anterior replacement teeth.
11. Laboratory procedures for framework construction-in brief.
12. Fitting the framework - in brief.
13. Try-in of the partial denture - in brief.
14. Completion of the partial denture - in brief.
15. Inserting the Removable Partial Denture - in brief.
16. Postinsertion observations.
17. Temporary Acrylic Partial Dentures.
18. Immediate Removable Partial Denture.
19. Removable Partial Dentures opposing Complete denture.

Note : It is suggested that the above mentioned topics be dealt with wherever appropriate in the following order so as to cover –

1. Definition
2. Diagnosis (of the particular situation /patient selection /treatment planning)
3. Types / Classification
4. Materials
5. Methodology – Lab /Clinical
6. Advantages & disadvantages
7. Indications, contraindications
8. Maintenance Phase

Fixed Partial Dentures

Topics To Be Covered In Detail -

1. Introduction
2. Fundamentals of occlusion – in brief.
3. Articulators – in brief.
4. Treatment planning for single tooth restorations.
5. Treatment planning for the replacement of missing teeth including selection and choice of abutment teeth.
6. Fixed partial denture configurations.
7. Principles of tooth preparations.
8. Preparations for full veneer crowns – in detail.
9. Preparations for partial veneer crowns – in brief.
10. Provisional Restorations
11. Fluid Control and Soft Tissue Management
12. Impressions
13. Working Casts and Dies
14. Wax Patterns
15. Pontics and Edentulous Ridges
16. Esthetic Considerations
17. Finishing and Cementation

Topics To Be Covered In Brief -

1. Solder Joints and Other Connectors
2. All - Ceramic Restorations
3. Metal - Ceramic Restorations
4. Preparations of intracoronal restorations.
5. Preparations for extensively damaged teeth.
6. Preparations for periodontally weakened teeth
7. The Functionally Generated Path Technique
8. Investing and Casting
9. Resin - Bonded Fixed Partial Denture

Note : It is suggested that the above mentioned topics be dealt with wherever appropriate in the following order so as to cover –

1. Definition
2. Diagnosis(of the particular situation /patient selection /treatment planning)
3. Types / Classification
4. Materials
5. Methodology – Lab /Clinical
6. Advantages & disadvantages
7. Indications, contraindications
8. Maintenance Phase

RECOMMENDED BOOKS:

1. Syllabus of Complete denture by - Charles M. Heartwell Jr. and Arthur O. Rahn.
2. Boucher's "Prosthetic treatment for edentulous patients"
3. Essentials of complete denture prosthodontics by – Sheldon Winkler.
4. Maxillofacial prosthetics by – Willam R.Laney.
5. McCracken's Removable partial prosthodontics
6. Removable partial prosthodontics by – Ernest L. Miller and Joseph E. Grasso.

19. AESTHETIC DENTISTRY

Aesthetic Dentistry is gaining more popularity since last decade. It is better that undergraduate students should understand the philosophy and scientific knowledge of the esthetic dentistry.

1. Introduction and scope of esthetic dentistry
2. Anatomy & physiology of smile
3. Role of the colour in esthetic dentistry
4. Simple procedures (roundening of central incisors to enhance esthetic appearance)
5. Bleaching of teeth
6. Veneers with various materials
7. Preventive and interceptive esthetics
8. Ceramics
9. Simple gingival contouring to enhance the appearance
10. Simple clinical procedures for BDS students

Recommended books:

1. Esthetic guidelines for restorative dentistry; Scharer & others
2. Esthetics of anterior fixed prosthodontics; Chiche (GJ) & Pinault (Alain)
3. Esthetic & the treatment of facial form, Vol 28; Mc Namara (JA)

20. FORENSIC ODONTOLOGY (30 hrs of instruction)

Definition

Forensic is derived from the Latin word forum, which means 'court of law.' Odontology literally implies 'the study of teeth.' Forensic odontology, therefore, has been defined by the Fédération Dentaire Internationale (FDI) as "that branch of dentistry which, in the interest of justice, deals with the proper handling and examination of dental evidence, and with the proper evaluation and presentation of dental findings."

Objectives of the undergraduate curriculum

At the end of the programme, the dental graduate should:

1. Have sound knowledge of the theoretical and practical aspects of forensic odontology.
2. Have an awareness of ethical obligations and legal responsibilities in routine practice and forensic casework.
3. Be competent to recognise forensic cases with dental applications when consulted by the police, forensic pathologists, lawyers and associated professionals.
4. Be competent in proper collection of dental evidence related to cases of identification, ethnic and sex differentiation, age estimation and bite marks.
5. Be able to assist in analysis, evaluation, and presentation of dental facts within the realm of law.

Curriculum for forensic odontology

1. Introduction to forensic dentistry
 - Definition and history
 - Recent developments and future trends
2. Overview of forensic medicine and toxicology
 - Cause of death and postmortem changes
 - Toxicological manifestations in teeth and oral tissues
3. Dental identification
 - Definition
 - Basis for dental identification
 - Postmortem procedures
 - Dental record compilation and interpretation
 - Comparison of data, and principles of report writing
 - Identification in disasters and handling incinerated remains
 - Postmortem changes to oral structures
4. Maintaining dental records
 - Basic aspects of good record-keeping
 - Different types of dental records
 - Dental charts
 - Dental radiographs
 - Study casts
 - Denture marking
 - Photographs

- Dental notations
 - Relevance of dental records in forensic investigation
5. Age estimation
 - Age estimation in children and adolescents
 - Advantages of tooth calcification over 'eruption' in estimating age
 - Radiographic methods of Schour & Massler, Demirjian et al
 - Age estimation in adults
 - Histological methods – Gustafson's six variables and Johanson's modification, Bang & Ramm's dentine translucency
 - Radiographic method of Kvaal et al
 - Principles of report writing
 6. Sex differentiation
 - Sexual dimorphism in tooth dimensions (Odontometrics)
 7. Ethnic variations ('racial' differences) in tooth morphology
 - Description of human population groups
 - Genetic and environmental influences on tooth morphology
 - Description of metric and non-metric dental features used in ethnic differentiation
 8. Bite mark procedures
 - Definition and classification
 - Basis for bite mark investigation
 - Bite mark appearance
 - Macroscopic and microscopic ageing of bite marks
 - Evidence collection from the victim and suspect of bite mark
 - Analysis and comparison
 - Principles of report writing
 - Animal bite investigation
 9. Dental DNA methods
 - Importance of dental DNA evidence in forensic investigations
 - Types of DNA and dental DNA isolation procedures
 - DNA analysis in personal identification
 - Gene-linked sex dimorphism
 - Population genetics
 10. Jurisprudence and ethics
 - Fundamentals of law and the constitution
 - Medical legislation and statutes (Dental and Medical Council Acts, etc)
 - Basics of civil law (including torts, contracts and consumer protection act)
 - Criminal and civil procedure code (including expert witness requirement)
 - Assessment and quantification of dental injuries in courts of law
 - Medical negligence and liability
 - Informed consent and confidentiality
 - Rights and duties of doctors and patients
 - Medical and dental ethics (as per Dentists' Act)

Theory sessions and practical exercises

Total hours for the course

- Didactic – 10-12 hours
- Practical – 20-25 hours

Detailed didactic sessions for the above components, either in the form of lectures or as structured student-teacher interactions, is essential. Specialists from multiple disciplines, particularly from legal and forensic sciences, can be encouraged to undertake teaching in their area of expertise.

An interactive, navigable and non-linear (INN) model may also be utilised for education.

Practical exercises (real-life casework and/or simulated cases) must complement didactic sessions to facilitate optimal student understanding of the subject. Mandatory practical training in dental identification methods, dental profiling (ethnic and sex differences, radiographic age estimation), and bite mark procedures, is of paramount importance. In addition, practical exercises/demonstrations in histological age estimation, comparative dental anatomy, DNA methods, medical autopsy, court visits, and other topics may be conducted depending on available expertise, equipment and feasibility.

Approach to teaching forensic odontology

Forensic odontology could be covered in two separate streams. The divisions include a preclinical stream and a clinical stream.

Preclinical stream

- Introduction to forensic odontology
- Sex differences in odontometrics
- Ethnic variations in tooth morphology
- Histological age estimation
- Dental DNA methods

- Bite marks procedures
- Overview of forensic medicine and toxicology

It could prove useful to undertake the preclinical stream in II or III year under Oral Biology/Oral Pathology since these aspects of forensic odontology require grounding in dental morphology, dental histology and basic sciences, which, students would have obtained in I and/or II BDS.

Clinical stream

- Dental identification
- Maintaining dental records
- Radiographic age estimation
- Medical jurisprudence and ethics

It would be suitable to undertake these topics in the IV or V year as part of Oral Medicine and Radiology, since students require reasonable clinical exposure and acumen to interpret dental records, perform dental postmortems and analyse dental radiographs for age estimation.

21. ORAL IMPLANTOLOGY (30 hrs of instruction)

INTRODUCTION TO ORAL IMPLANTOLOGY

Oral Implantology is now emerged as a new branch in dentistry world wide and it has been given a separate status in the universities abroad. In India day to day the practice of treating patients with implants are on rise. In this contest inclusion of this branch into under graduate curriculum has become very essential. The objective behind this is to impart basic knowledge of Oral Implantology to undergraduates and enable them to diagnose, plan the treatment and to carry out the needed pre surgical mouth preparations and treat or refer them to speciality centres. This teaching programme may be divided and carried out by the Dept. of Oral Surgery, Prosthodontics and Periodontics.

1. History of implants, their design & surface characteristics and osseo-integration
2. Scope of oral & maxillofacial implantology & terminologies
3. A brief introduction to various implant systems in practice
4. Bone biology, Morphology, Classification of bone and its relevance to implant treatment and bone augmentation materials.
5. Soft tissue considerations in implant dentistry
6. Diagnosis & treatment planning in implant dentistry
Case history taking/Examination/Medical evaluation/Orofacial evaluation/ Radiographic evaluation/ Diagnostic evaluation/ Diagnosis and treatment planning/ treatment alternatives/ Estimation of treatment costs/ patient education and motivation
7. Pre surgical preparation of patient
8. Implant installation & armamentarium for the Branemark system as a role model
9. First stage surgery – Mandible – Maxilla
10. Healing period & second stage surgery
11. Management of surgical complications & failures
12. General considerations in prosthodontic reconstruction & Bio mechanics
13. Prosthodontic components of the Branemark system as a role model
14. Impression procedures & Preparation of master cast
15. Jaw relation records and construction of suprastructure with special emphasis on occlusion for osseointegrated prosthesis
16. Management of prosthodontic complications & failures
17. Recall & maintenance phase.

Criteria for success of osseointegrated implant supported prosthesis

SUGGESTED BOOKS FOR READING

1. Contemporary Implant Dentistry - Carl .E. Misch
Mosby 1993 First Edition.
2. Osseointegration and Occlusal Rehabilitation Hobo S., Ichida. E. and
Garcia L.T.
Quintessence Publishing Company, 1989 First
Edition.

22. BEHAVIOURAL SCIENCES (20 hrs of instruction)

GOAL:

The aim of teaching behavioural sciences to undergraduate student is to impart such knowledge & skills that may enable him to apply principles of behaviour –

- a) For all round development of his personality
- b) In various therapeutic situations in dentistry.

The student should be able to develop skills of assessing psychological factors in each patient, explaining stress, learning simple counselling techniques, and improving patients compliance behaviour.

OBJECTIVES:A) KNOWLEDGE & UNDERSTANDING:

At the end of the course, the student shall be able to:

- 1) Comprehend different aspects of normal behaviour like learning, memory, motivation, personality & intelligence.
- 2) Recognise difference between normal and abnormal behaviour.
- 3) Classify psychiatric disorders in dentistry.
- 4) Recognise clinical manifestations of dental phobia, dental anxiety, facial pain, orofacial manifestations of psychiatric disorders, and behavioural problems in children. Addictive disorders, psychological disorders in various dental departments.
- 5) Should have understanding of stress in dentistry and knowledge of simple counselling techniques.
- 6) Have some background knowledge of interpersonal, managerial and problem solving skills which are an integral part of modern dental practice.
- 7) Have knowledge of social context of dental care.

B) SKILLS

The student shall be able to:

- 1) Interview the patient and understand different methods of communication skills in dentist - patient relationship.
- 2) Improve patients compliance behaviour.
- 3) Develop better interpersonal, managerial and problem solving skills.
- 4) Diagnose and manage minor psychological problems while treating dental patients.

INTEGRATION:

The training in Behavioural sciences shall prepare the students to deliver preventive, promotive, curative and rehabilitative services to the care of the patients both in family and community and refer advanced cases to specialised psychiatric hospitals.

Training should be integrated with all the departments of Dentistry, Medicine, Pharmacology, Physiology and Biochemistry.

PSYCHOLOGY:

1. Definition & Need of Behavioural Science. Determinants of Behaviour. Hrs 1 Scope of Behavioural Science.
2. Sensory process & perception perceptual process- clinical applications.
3. Attention - Definition - factors that determine attention. Clinical application.
4. Memory - Memory process - Types of memory , Forgetting: Methods to improve memory, Clinical assessment of memory & clinical applications.
5. Definition - Laws of learning
Type of learning. Classical conditioning, operant conditioning, cognitive learning, Insight learning, social learning, observational learning, principles of learning- Clinical application.
6. Intelligence- Definition: Nature of intelligence stability of intelligence
Determinants of intelligence, clinical application
7. Thinking - Definition: Types of thinking, delusions, problem solving
8. Motivation - Definition: Motive, drive, needs classification of motives
9. Emotions - Definition differentiation from feelings – Role of hypothalamus, Cerebral cortex, adrenal glands ANS. Theories of emotion, Types of emotions.
Personality. Assessment of personality: Questionnaires, personality inventory, rating scales, Interview projective techniques – Rorschach ink blot test , RAT, CAT

SOCIOLOGY:

Social class, social groups – family, types of family, types of marriages, communities and Nations and institutions.

REFERENCE BOOKS:

1. General psychology -- S.K. Mangal
2. General psychology -- Hans Raj, Bhatia
3. General psychology -- Munn
4. Behavioural Sciences in Medical practise -- Manju Mehta
5. Sciences basic to psychiatry -- Basanth Puri & Peter J Tyrer

23. ETHICS (20 hrs. of instruction)Introduction:

There is a definite shift now from the traditional patient and doctor relationship and delivery of dental care. With the advances in science and technology and the increasing needs of the patient, their families and community, there is a concern for the health of the community as a whole. There is a shift to greater accountability to the society. Dental specialists like the other health professionals are confronted with many ethical problems. It is therefore absolutely necessary for each and every one in the health care delivery to prepare themselves to deal with these problems. To accomplish this and

develop human values Council desires that all the trainees undergo ethical sensitization by lectures or discussion on ethical issues, discussion of cases with an important ethical component.

Course content:

Introduction to ethics –

- what is ethics?
- What are values and norms?
- How to form a value system in one's personal and professional life?
- Hippocratic oath.
- Declaration of Helsinki, WHO declaration of Geneva, International code of ethics, DCI Code of ethics.

Ethics of the individual –

The patient as a person.
 Right to be respected
 Truth and confidentiality
 Autonomy of decision
 Doctor Patient relationship

Profession Ethics –

Code of conduct
 Contract and confidentiality
 Charging of fees, fee splitting
 Prescription of drugs
 Over-investigating the patient
 Malpractice and negligence

Research Ethics –

Animal and experimental research/humanness
 Human experimentation
 Human volunteer research-informed consent
 Drug trials

Ethical workshop of cases

Gathering all scientific factors

Gathering all value factors

Identifying areas of value – conflict, setting of priorities

Working our criteria towards decisions

Recommended Reading:

Medical Ethics, Francis C.M., I Ed. 1993, Jaypee Brothers, New Delhi p. 189.

**DENTAL COUNCIL OF INDIA
Revised Internship Programme, 2011**

CURRICULUM OF DENTAL INTERNSHIP PROGRAMME.

1. The duration of Internship shall be one year.
2. All parts of internship shall be done in a Dental College duly recognized/approved by the Dental Council of India for the purpose of imparting education and training to Dental graduates in the country.
3. The Internss shall be paid stipendiary allowance during the period of an Internship not extending beyond a period of one year.
4. The internship shall be compulsory and rotating as per the regulations prescribed for the purpose.
5. The degree- BDS shall be granted after completion of internship.

Determinants of Curriculum for internship for Dental Graduates:

The curricular contents of internship training shall be based on.

- i) Dental health needs of the society.
- ii) Financial, material and manpower resources available for the purpose.
- iii) National Dental Health Policy.
- iv) Socio-economic conditions of the people in general.
- v) Existing Dental as also the primary health care concept, for the delivery of health services.
- vi) Task analysis of what graduates in Dentistry in various practice settings, private and government service actually perform.
- vii) Epidemiological studies conducted to find out prevalence of different dental health problems, taking into consideration the magnitude of dental problems, severity of dental problems and social disruption caused by these problems.

Objectives:

- A. To facilitate reinforcement of learning and acquisition of additional knowledge:-
 - a) Reinforcement of knowledge.
 - b) Techniques & resources available to the individual and the community; Social and cultural setting.
 - c) Training in a phased manner, from a shared to a full responsibility.
- B. To facilitate the achievement of basic skills: attaining competence Vs. maintaining competence in:-
 - i) History taking.
 - ii) Clinical Examination.
 - iii) Performance and interpretation of essential laboratory data.
 - iv) Data analysis and inference.
 - v) Communication skills aimed at imparting hope and optimism in the patient.
 - vi) Attributes for developing working relationship in the Clinical setting and Community team work.
- C. To facilitate development of sound attitudes and habits:-
 - i) Emphasis on individual and human beings, and not on disease/symptoms.
 - ii) Provision of comprehensive care, rather than fragmentary treatment.
 - iii) Continuing Dental Education and Learning of accepting the responsibility.
- D. To facilitate understanding of professional and ethical principles:-
 - Right and dignity of patients.
 - Consultation with other professionals and referral to seniors/institutions.
 - Obligations to peers, colleagues, patients, families and Community.
 - Provision of free professional services in an emergent situation.

- E To initiate individual and group action, leading to disease prevention and dental health promotion, at the level of individuals families and the community.

Content (subject matter)

The compulsory rotating paid Dental Internship shall include training in Oral Medicine & Radiology; Oral & Maxillofacial Surgery; Prosthodontics; Periodontics; Conservative Dentistry; Pedodontics; Oral Pathology & Microbiology; Orthodontics and Community Dentistry.

General Guidelines:

1. It shall be task-oriented training. The interns should participate in various institutional and field programmes and be given due responsibility to perform the activities in all departments of the Dental Colleges and associated Institutions.
2. To facilitate achievement of basic skills and attitudes the following facilities should be provided to all dental graduates:
 - i) History taking, examination, diagnosis, charting and recording treatment plan of cases.
 - ii) Presentation of cases in a group of Seminar.
 - iii) Care and sterilization of instruments used.
 - iv) Performance and interpretation of essential laboratory tests and other relevant investigations.
 - v) Data analysis and inference.
 - vi) Proper use of antibiotics, anti-inflammatory and other drugs, as well as other therapeutic modalities.
 - vii) Education of patients, their relatives and community on all aspects of dental health care while working in the institution as also in the field.
 - viii) Communication aimed at inspiring hope, confidence and optimism.
 - ix) Legal rights of patients and obligations of dental graduate under forensic jurisprudence.

1. **Oral Medicine & Radiology:**

- | | |
|---|------------------------|
| 1. Standardized examination of patients | 25 Cases |
| 2. Exposure to clinical, pathological laboratory procedures and biopsies. | 5 Cases |
| 3. Effective training in taking of Radiographs:
(Intra-oral) I.O. (Extra oral) E.O.
Cephalogram | 2 Full mouth
1
1 |
| 4. Effective management of cases in wards | 2 Cases |

2. **Oral and Maxillofacial surgery**

A. The Interness during their posting in oral surgery shall perform the following procedures:

- | | |
|---|----|
| 1. Extractions | 50 |
| 2. Surgical extractions | 2 |
| 3. Impactions | 2 |
| 4. Simple Intra Maxillary Fixation | 1 |
| 5. Cysts enucleations | 1 |
| 6. Incision and drainage | 2 |
| 7. Alveoloplasties, Biopsies & Frenectomies, etc. | 3 |

B. The Interness shall perform the following on Cancer Patients:

1. Maintain file work.
2. Do extractions for radiotherapy cases.
3. Perform biopsies.
4. Observe varied cases of oral cancers.

C. The interness shall have 15 days posting in emergency services of a dental/general hospital with extended responsibilities in emergency dental care in the wards. During this period they shall attend to all emergencies under the direct supervision of oral surgeon during any operation:

1. **Emergencies.**

(i) Toothache; (ii) trigeminal neuralgia; (iii) Bleeding from mouth due to trauma, post extraction, bleeding disorder or haemophilia; (iv) Airway obstruction due to fracture mandible and maxilla; dislocation of mandible; syncope or vasovagal attacks; Ludwig's angina; tooth fracture; post intermaxillary fixation after general Anaesthesia.

2. Work in I.C.U. with particular reference to resuscitation procedures.

3. Conduct tutorials on medico-legal aspects including reporting on actual cases coming to casualty. They should have visits to law courts.

3. **Prosthodontics**

The dental graduates during their internship posting in Prosthodontics shall make:-

1. Complete denture (upper & lower)	2
2. Removable Partial Denture	4
3. Fixed Partial Denture	1
4. Planned cast partial denture	1
5. Miscellaneous-like reline/overdenture/repairs of Maxillofacial Prosthesis	1
6. Learning use of Face bow and Semi anatomic articulator technique	
7. Crowns	
8. Introduction of Implants	1

4. **Periodontics**

A. The dental graduates shall perform the following procedures

1. Prophylaxis	15 Cases
2. Flap Operation	2 Cases
3. Root Planning	1 Case
4. Curettage	1 Case
5. Gingivectomy	1 Case
6. Perio-Endo cases	1 Case

B. During their one week posting in the community health centers, the interns shall educate the public in prevention of Periodontal diseases.

5. **Conservative Dentistry**

To facilitate reinforcement of learning and achievement of basic skills, the interns shall perform atleast the following procedures independently or under the guidance of supervisors:

1. Restoration of extensively mutilated teeth	5 Cases
2. Inlay and onlay preparations	1 Case
3. Use of tooth coloured restorative materials	4 Cases
4. Treatment of discoloured vital and non-vital teeth	1 Case
5. Management of dento alveolar fracture	1 Case
6. Management of pulpless, single-rooted teeth without periapical lesion.	4 Cases
7. Management of acute dento alveolar Infections	2 Cases
8. Management of pulpless, single-rooted teeth with periapical lesion.	1 Case
9. Non-surgical management of traumatised teeth during formative period.	

6. **Pedodontics and Preventive Dentistry**

During their posting in Pedodontics the Dental graduates shall perform:

1. Topical application of fluorides including varnish	5 Cases
2. Restorative procedures of carious deciduous teeth in children.	10 Cases
3. Pulpotomy	2 Cases
4. Pulpectomy	2 Cases
5. Fabrication and insertion of space maintainers	1 Case

6. Oral habit breaking appliances 1 Case
7. **Oral Pathology and Microbiology**
The interns shall perform the following:
- | | |
|---|---------|
| 1. History-recording and clinical examination | 5 Cases |
| 2. Blood, Urine and Sputum examination | 5 Cases |
| 3. Exfoliative Cytology and smears study | 2 Cases |
| 4. Biopsy- Laboratory Procedure & reporting | 1 Case |
8. **Orthodontics**
- A. The interns shall observe the following procedures during their posting in Orthodontics:
1. Detailed diagnostic procedures for 5 patients
 2. Laboratory techniques including wire-bending for removable appliances, soldering and processing of myo-functional appliances.
 3. Treatment planning options and decisions.
 4. Making of bands, bonding procedures and wire insertions.
 5. Use of extra oral anchorage and observation of force values.
 6. Retainers.
 7. Observe handling of patients with oral habits causing malocclusions.
- The dental graduates shall do the following laboratory work:-
- | | |
|--|-----------|
| 1. Wire bending for removable appliances and space maintainers including welding and heat treatment procedure. | - 5 Cases |
| 2. Soldering exercises, banding & bonding procedures | - 2 Cases |
| 3. Cold-cure and heat-cure acrylisation of simple Orthodontic appliances | - 5 Cases |
9. **Public Health Dentistry**
1. The interns shall conduct health education sessions for individuals and groups on oral health public health nutrition, behavioral sciences, environmental health, preventive dentistry and epidemiology.
 2. They shall conduct a short term epidemiological survey in the community, or in the alternate, participate in the planning and methodology.
 3. They shall arrange effective demonstrations of:
 - a) Preventive and interceptive procedures for prevalent dental diseases.
 - b) Mouth-rinsing and other oral hygiene demonstrations 5 Cases
 - c) Tooth brushing techniques 5 Cases
 4. Conduction of oral health education programmes at
 - A) School setting 2
 - B) Community setting 2
 - C) Adult education programmes 2
 5. Preparation of Health Education materials 5
 6. Exposure to team concept and National Health Care systems:
 - a) Observation of functioning of health infrastructure.
 - b) Observation of functioning of health care team including multipurpose workers male and female, health educators and other workers.
 - c) Observation of atleast one National Health Programme:-
 - d) Observation of interlinkages of delivery of oral health care with Primary Health care.
Mobile dental clinics, as and when available, should be provided for this teachings.
10. **Elective Posting**
The Interns shall be posted for 15 days in any of the dental departments of their choice mentioned in the foregoing.

Organisation of content:

The Curriculum during the 4 years of BDS training is subject based with more emphasis on learning practical skills. During one year internship the emphasis will be on competency-based, community oriented training. The practical skills to be mastered by the interns along with the minimum performance level are given under the course content of different departments of Dental Education. The supervisors should seeing it that proper facilities are provided in all departments and attached institutions for their performance.

Specification of teaching activities:

Didactic lectures are delivered during the four years training in BDS. These shall be voided during the internship programme. Emphasis shall be on chair-side teaching, small group teaching and discussions tutorials, seminars, ward posting, laboratory posting, field visits and self learning.

Use of Resource Materials:

Overhead projectors, slide projectors, film projectors, charts, diagrams, photographs, posters, specimens, models and other audiovisual aids shall be provided in all the Dental Colleges and attached institutions and field area. If possible, television, video and tapes showing different procedures and techniques to be mastered by the interns should be provided.

Evaluation**1. Formative Evaluation:**

Day-to-day assessment of the interns during their internship posting should be done. The objective is that all the interns must acquire necessary minimum skills required for carrying out day-to-day professional work competently. This can be achieved by maintaining records and performance data book by all interns. This will not only provide a demonstrable evidence; of the processes of training but more importantly, of the interns own acquisition of competencies as related to performance. It shall form a part of formative evaluation and shall also constitute a component of final grading of interns.

2. Summative Evaluation:

It shall be based on the observation of the supervisors of different departments and the records and performance data book maintained by the interns. Grading shall be done accordingly.

11. Rural Services

In the rural services, the student will have to participate in-

1. Community Health Monitoring programmes and services which include Preventive, Diagnostic and corrective procedures
2. To create educational awareness about dental hygiene and diseases.
3. Conduction of Oral Health Education Programmes at –
 - (a) School Setting - 5
 - (b) community Setting - 5
 - (c) Adult Education Programme - 5
4. compulsory setup of satellite clinics in remote areas - 1
5. Lectures to create awareness and education in public forums about the harmful effects of tobacco consumption and the predisposition to oral cancer – two Lectures per student.

Period of Postings

1	Oral Medicine & Radiology	-	1 month
2	Oral & Maxillofacial Surgery	-	1 ½ months
3	Prosthodontics	-	1 ½ months
4	Periodontics	-	1 month
5	Conservative Dentistry	-	1 month
6	Pedodontics	-	1 month
7	Oral Pathology and Microbiology	-	15 days

8	Orthodontics	-	1 month
9	Community Dentistry/ Rural Services	-	3 months
10	Elective	-	15 days

SYLLABUS

for Courses affiliated to the

Kerala University of Health Sciences

Thrissur 680596



Bachelor of Dental Surgery [B.D.S]

Course Code 002

(2016-17 Academic year onwards)

2016

TABLE OF CONTENTS		
Sl. No:	Item	Page No:
1	Course Content	3
2	Syllabus	17
3	Examinations	185
4	Internship	194
5	Annexure	207

सर्वे भयन्तु सुखिनः

2. Course Content

2.1. Title of course:

Bachelor of Dental Surgery (B.D.S)

2.2. Aims & Objectives of BDS Course

A. Aims:

To create a graduate in Dental Science who has adequate knowledge, necessary skills and such attitudes which are required for carrying out all the activities appropriate to general dental practice involving the prevention, diagnosis and treatment of anomalies and diseases of the teeth, mouth, jaws and associated tissues. The graduate should also understand the concept of community oral health education and be able to participate in the rural health care delivery programmes existing in the country.

B. Objectives:

The objectives are dealt under three headings namely (a) knowledge and understanding (b) skills and (c) attitudes.

(a) ***Knowledge and understanding***

The student should acquire the following during the period of training.

1. Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods and principles of biological functions.
2. Adequate knowledge to evaluate and analyse scientifically various established facts and data.
3. Adequate knowledge of the development, structure and function of teeth, mouth, jaws and associated tissues both in health and disease and their relationship and effect on general state of health and also their bearing on physical and social well-being of the patient.
4. Adequate knowledge of clinical disciplines and methods, which provide a coherent picture of anomalies, lesions and diseases of the teeth, mouth and jaws.
5. Adequate knowledge on the preventive, diagnostic and therapeutic aspects of dentistry.
6. Adequate knowledge on laboratory steps involved in dental treatment.
7. Adequate clinical experience required for general dental practice.

8. Adequate knowledge of biological function and behavior of persons in health and sickness as well as the influence of natural and social environment on the state of health so far as it affects dentistry.

(b) Skills

A graduate should be able to demonstrate the following skills necessary for practice of dentistry:

1. Able to diagnose and manage various common dental problems encountered in general dental practice, keeping in mind the expectations and the right of the society to receive the best available treatment wherever possible.
2. Acquire skill to prevent and manage complications if any encountered while carrying out various dental surgical and other procedures.
3. Possess skill to carry out required investigative procedures and ability to interpret laboratory findings.
4. Acquire skill in laboratory procedures involved in dental treatment.
5. Promote oral health and help to prevent oral diseases wherever possible.
6. Competent in control of pain and anxiety during dental treatment.

(c) Attitudes

A graduate should develop during the training period the following attitudes.

1. Willing to apply current knowledge of dentistry in the best interest of the patients and the community.
2. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
3. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community.
4. Willingness to participate in the continuing education programmes to update knowledge and professional skills from time to time.
5. To help and to participate in the implementation of national health programmes.

C. Goals of BDS Curriculum

On completion of the undergraduate training program the graduates shall be competent in the following. –

i. General Skills

- Apply knowledge & skills in day to day practice.
- Apply principles of ethics.
- Analyze the outcome of treatment.
- Evaluate the scientific literature and information to decide the treatment.

- Participate and involve in professional bodies.
- Be capable of self-assessment and be willing to update the knowledge & skills from time to time.
- Inclined to do simple research projects.
- Acquire minimum computer proficiency to enhance knowledge and skills.
- Be aware of one's limitations and know when to refer patients to specialists.
- Be familiar with basic Forensic Odontology techniques and manage Geriatric dental problems.
- Death certification

ii. Practice Management

- Evaluate practice location, population dynamics & reimbursement mechanism.
- Able to communicate freely, orally and in writing with all concerned.
- Maintain records.
- Implement & monitor infection control and environmental safety programs.
- Practice within the scope of one's competence Communication & Community Resources.
- Assess patient's goals, values and concerns to establish rapport and guide patient care.
- Co-ordinate & supervise the activities of allied dental health personnel.
- Participate in improving the oral health of the individuals through community activities.

iii. Patient Care – Diagnosis

- Obtaining patient's history in a methodical way.
- Performing thorough clinical examination.
- Selection and interpretation of clinical, radiological and other diagnostic information.
- Obtaining appropriate consultation.
- Arriving at provisional, differential and final diagnosis.

iv. Patient Care - Treatment Planning

- Integrate multiple disciplines into an individual comprehensive sequenced treatment plan using diagnostic and prognostic information.
- Be able to order appropriate investigations.

v. Patient Care – Treatment

- Recognition and initial management of medical emergencies that may occur during Dental treatment.
- Perform basic cardiac life support.
- Management of pain including post operative.
- Administration of all forms of local anesthesia.
- Administration of intra muscular and venous injections.
- Prescription of drugs, pre operative, prophylactic and therapeutic requirements.
- Uncomplicated extraction of teeth.
- Transalveolar extractions and removal of simple impacted teeth.
- Minor oral surgical procedures.
- Management of Oro-facial infections.
- Simple orthodontic appliance therapy.
- Taking, processing and interpretation of various types of intra oral radiographs.
- Various kinds of restorative procedures using different materials available.
- Simple endodontic procedures.
- Removable and basic fixed Prosthodontics.
- Various kinds of periodontal therapy.

D. Competencies Expected- Specialty wise

ORAL MEDICINE & RADIOLOGY

On completion of the undergraduate training programme the graduate should:

- Be able to identify the common dental problems like dental caries and periodontal disease and their sequelae
- Be able to differentiate the normal variations and oral mucosal lesions
- Be able to identify pre cancerous and cancerous lesions of the oral cavity and refer to the concerned specialty for their management.
- Have an adequate knowledge about common laboratory investigations and interpretation of their results.
- Have adequate knowledge about medical complications that can arise while treating systemically compromised patients and take prior precautions/ consent from the concerned medical specialist.

- To formulate a clinical diagnosis, order investigations, seek expert consultations to come to a final diagnosis and chart out a proper treatment plan for patients with oral lesions.
- Have adequate knowledge about radiation health hazards, radiation safety and protection.
- Be competent to take intra-oral radiographs and interpret the radiographic findings
- Gain adequate knowledge of various extra-oral radiographic procedures, TMJ radiography and sialography.
- Be aware of the importance of intra- and extra-oral radiographs in forensic identification and age estimation.
- Be familiar with jurisprudence, ethics and understand the significance of dental records with respect to law.

ORAL & MAXILLOFACIAL SURGERY

On completion of the undergraduate training programme the graduate should:

- Be able to apply the knowledge gained in the basic medical and clinical subjects in the management of patients with surgical problems.
- Be able to diagnose, manage and treat patients with basic oral surgical problem
- Have a broad knowledge of maxillofacial surgery and oral Implantology.
- Be familiar with legal, ethical and moral issues pertaining to patient care and communication skills.
- Have acquired the skill to examine any patient with an oral surgical problem in an orderly manner.
- Understand and practice the basic principles of asepsis and sterilization.
- Be competent in the extraction of the teeth under local anesthesia.
- Be Competent to carry out certain minor oral surgical procedures under Local Anesthesia like trans-alveolar extraction, frenectomy, Dentoalveolar procedures, simple impaction, biopsy, etc.
- Be Competent to assess, prevent and manage common complications that arise during and after minor oral surgery.
- Able to provide primary care and manage medical emergencies in the dental office.
- Be familiar with the management of major oral surgical problems and principles involved in the in-patient management.
- Be able to Certify Death

PERIODONTOLOGY

On completion of the undergraduate training programme the graduate should:

- Be able to diagnose the patient's periodontal problem, plan and perform appropriate periodontal treatment.
- Be Competent to educate and motivate the patient.
- Be Competent to perform thorough oral prophylaxis, subgingival scaling, root planning and minor periodontal surgical procedures.
- Give proper post treatment instructions and do periodic recall and evaluation.
- Be Familiar with concepts of osseointegration and basic surgical aspects of implantology.

CONSERVATIVE DENTISTRY AND ENDODONTICS

On completion of the undergraduate training programme the graduate should:

- Be Competent to diagnose all carious lesions.
- Be Competent to perform Class I and Class II cavities and their restoration with amalgam.
- Be able to restore class V and Class III cavities with glass ionomer cement.
- Be able to diagnose and appropriately treat pulpally involved teeth (pulp capping procedures).
- Be able to perform RCT for anterior teeth
- Be competent to carry out small composite restorations
- Understand the principles of aesthetic dental procedures

ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS

On completion of the undergraduate training programme the graduate should:

- Understand about normal growth and development of facial skeleton and dentition.
- Be able to pinpoint aberrations in growth process both dental and skeletal and plan necessary treatment
- Be able to diagnose the various malocclusion categories
- Be able to motivate and explain to the patient and parent/guardian about the necessity of treatment
- Be able to plan and execute preventive orthodontics (space maintainers or space regainers)
- Be able to plan and execute interceptive orthodontics (habit breaking appliances)

- Be able to manage treatment of simple malocclusion such as anterior spacing using removable appliances
- Be able to handle delivery and activation of removable orthodontic/myofacial appliances.
- Be able to diagnose and appropriately refer patients with complex malocclusion to the specialist.

PUBLIC HEALTH DENTISTRY

On completion of the undergraduate training programme the graduate should:

- Apply the principles of health promotion and disease prevention.
- Have knowledge of the organization and provision of health care in community and in the hospital service
- Have knowledge of the prevalence of common dental conditions in India
- Have knowledge of community based preventive measures
- Have knowledge of the social, cultural and environmental factors, which contribute to health or illness.
- Be able to administer hygiene instructions, topical fluoride therapy and fissure sealing.
- Be able to educate patients concerning the etiology and prevention of oral disease and encourage them to assume responsibility for their oral health.

PROSTHODONTICS AND CROWN & BRIDGE

On completion of the undergraduate training programme the graduate should:

- Be able to understand and use various dental materials.
- Be competent to carry out treatment of conventional Simple complete and partial removable dentures and anterior crowns.
- Be able to carry out Prosthodontic laboratory procedures.
- Be familiar with the concepts of osseointegration and the value of implant-supported Prosthodontic procedures.
- Be able to diagnose and appropriately refer patients requiring complex treatment procedures to the specialist

PAEDIATRIC AND PREVENTIVE DENTISTRY

On completion of the undergraduate training programme the graduate should:

- Be able to instill a positive attitude and behavior in children towards oral health and understand the principles of prevention and preventive dentistry right from birth to adolescence.
- Be able to guide and counsel the parents/guardian in regards to various treatment modalities including different facets of preventive dentistry.
- Be able to treat dental diseases occurring in child patient.
- Be able to manage the physically and mentally challenged / disabled children effectively and efficiently, tailored to the needs of individual requirement and conditions.

2.3 Medium of Instruction

The medium of Instruction and examinations of BDS course will be in English language.

2.4 General Outline of BDS Degree Course

- 1) The undergraduate course involves organisation of year-wise teaching program. However, this course, as a whole, should demonstrate integration of the basic sciences, clinical dentistry and practical or laboratory skills. The course should be designed and integrated in such a way as to permit smooth progression from pre-clinical to clinical phase. Collaboration should be encouraged between teachers of basic sciences, dental sciences and clinical subjects.
- 2) The undergraduate dental course consists of three main components. The first component consists subjects common to modern medicine and dentistry like anatomy, physiology, biochemistry and behavioral science, leading to pharmacology, pathology, microbiology and then on to general medicine and general surgery. The second component runs concurrently with the first and deals with special aspects of oral and dental tissues, oral biology and oral pathology. Finally, the third component based on the foundations of the first two, deals with the clinical and technical aspects of dentistry as is required for general dental practice.
- 3) The first component of the course is intended to provide initially, an appreciation of normal human structure, development, function and behavior, leading to understanding of the diseases, its prevention and treatment. The main objective is to provide student with a broad knowledge of normal structures and functions of the body, the alterations which take place in disease with particular reference to those conditions in which medical and dental co-operation

is essential for proper management. At this stage, the student should also be made aware of the social and psychological aspects of patient care with special reference to the relationship between dentist and patient. The behavioral sciences including both sociology and psychology should be introduced at the initial stages of the training program, much before the students actually deal with the patients.

- 4) The second component of dental undergraduate program includes instruction in the subjects dealing with dental and oral aspects to ensure a detailed knowledge of the structure and function of the dental and oral tissues. This enables the student to diagnose, prevent and treat the dental and oral diseases and disorders, which were not included in the first component. The subject of oral biology is to be introduced at this level to provide the students a comprehensive knowledge and application of oral physiology, microbiology, biochemistry and oral immunology. Students should be exposed to the basic aspects of forensic odontology at this stage of the course along with oral biology/oral pathology.
- 5) The third component of the course comprising the clinical and technical aspects of dentistry actually prepares the student to undertake total oral and dental health care of patients of all ages. The emphasis at this stage should be on the prevention of the various dental diseases and how to preserve natural teeth with their supporting structures. The importance of various preventive methods needs to be stressed. The significance of diagnosis of various dental and oral problems needs to be emphasized along with treatment planning before actual treatment procedures are undertaken. In addition to acquiring the knowledge, the students need to gain adequate clinical hands-on-experience in extractions and other minor oral surgical procedures, all aspects of Conservative Dentistry, Endodontics, Crown and Bridge, provision of partial and complete dentures, various periodontal therapeutic procedures and use of removable orthodontic appliances. Familiarity with various radiological techniques, particularly intra-oral methods and proper interpretation of the radiographs, is an essential part of this component of training and has application in clinical diagnosis, forensic identification and age estimation. Training in handling medico-legal cases including death certification should be imparted at this stage. Towards the final stage of the clinical training, each student should be involved in comprehensive oral health care or holistic approach to enable him or her to plan and treat patients as a whole, instead of piece-meal treatment provided in each specialty. The aim of the undergraduate program should undoubtedly be to produce a graduate, competent in general dental practice.

- 6) The commitment towards the society as a whole needs to be stressed along with the knowledge and treatment skills gained. Instruction in public health dentistry should emphasise the sociological aspects of health care and palliative care particularly; oral health care, including the reasons for variation in oral and dental needs of different sections of the society. It is important to know the influence of social, behavioral, environmental and economic factors on oral and dental health. Students should be made aware of the National oral health Policy and the importance of being a member of the Health care team delivering medical and oral health care particularly among rural population. Students should also be encouraged to participate in simple research project work
- 7) The undergraduate curriculum stresses the significance of infection and cross infection control in dental practice. Aspects like sources of infection, measures to be adopted both general and specific for control, particularly the HIV and hepatitis is incorporated in the curriculum so that the graduates are aware of its significance and follow it in their practice.
- 8) The information technology has touched every aspect of an individual's personal and professional life. The University hence recommends that all undergraduates acquire minimum computer proficiency, which will enable them to enhance their professional knowledge and skills.

2.5 Duration & course of Study

1. The undergraduate dental training program leading to B.D.S. degree shall be of four and a half years duration in addition to one year compulsory paid rotating internship. During this period, the students shall be required to engage in full time study at a Dental college recognized or approved by the Dental Council of India. During the first four and a half years of undergraduate course, the instruction in clinical subjects should be at least for two and a half years.
2. **Basic Medical & Dental Subjects**
The basic medical and dental sciences comprise of Anatomy - Gross and Microscopic, Physiology, Biochemistry, Pharmacology, science of Dental Materials and Oral biology. Subjects like behavioral sciences, which would be useful to develop communication skills, should also be introduced in the first year itself and spread over the undergraduate course. An introduction to Public Health Dentistry also will be useful to develop the concept of commitment to community. The laboratory skills like pre-clinical Prosthodontics, Crown and Bridge, Conservative dentistry and Orthodontics is to be developed by the students.

Studying dental morphology also is a part of initial training. At the end of this period the student should be in a position to understand and comprehend in general the development, structure and function of the human body in both health and disease.

3. The instruction in basic dental sciences should include theoretical and practical aspects of oral anatomy and physiology, to provide a detailed knowledge of the form and structure of teeth, associated tissues and occlusal relationships. The study should also aim at development of a concept regarding physiological and biochemical processes relevant to oral cavity for better understanding of the changes that occur with the onset of disease in the oral cavity. The student should be made aware of the importance of various dental tissues in forensic investigation.
4. Clinical, Medical and Dental subjects:
The students should be introduced to clinics in the initial stage, preferably in the first year, as an observer to familiarize with clinical set-up and working. The period of instruction in the clinical subjects shall not be less than two and a half years full time. During this, the student shall attend a dental hospital, general hospital, community camps and satellite clinics, in order to obtain instruction and experience in the practice of dentistry. The main objective of training in clinical dental subjects is to produce a graduate, able and competent to recognize or diagnose various dental and oral diseases, to undertake general dental treatment, advice on the provision of specialized treatment available and finally advise the patient on prevention. The student should also understand the relationship between oral and systemic diseases.
5. The general medicine and surgery training should provide sufficient knowledge on human disease to enable the student to understand its manifestations as relevant to the practice of dentistry. This requires clinical teaching on patients and shall be carried out in inpatient and outpatient medical departments and specialist clinics. This clinical instruction should enable the student to understand and perhaps diagnose common systemic diseases, which have relevance to dental practice, by adopting a systematic approach of history taking and clinical examination. The student should also realize the significance of various general and special investigations in the diagnosis of diseases. The ability to recognize physical and mental illness, dealing with emergencies, effective communication with patients, and interaction with professional colleagues also become important aspects of this training.

6. All dental students should receive instruction in first-aid and principles of cardio-pulmonary resuscitation. The students should also attend to the accident and emergency department of a Medical hospital.
7. The purpose of the clinical training is to provide sufficient practical skill in all aspects of clinical dentistry. The instruction should also include patient management skills, treatment of patients of all ages with special reference to children (paediatric), very elderly (geriatric), medically compromised and disabled patients.
8. During the two and a half years of clinical course, the students should receive thorough instruction which involves history taking, diagnosis and treatment planning in all aspects of dentistry and should be competent on graduation to carry out all routine general procedures. In Oral & Maxillofacial Surgery, instruction should include the knowledge of various maxillofacial problems like injuries, infections and deformities of the jaws and associated structures. The clinical experience should include those procedures commonly undertaken in general practice like extraction of teeth, minor oral surgical procedure etc. In Conservative dentistry and Endodontics, Prosthodontics and Crown & Bridge and Periodontology students should be competent on graduation to carry out routine treatments like restorations of various types, endodontic procedures, removable Prosthodontics, and finally various kinds of periodontal therapy. In Orthodontics & Dentofacial Orthopaedics, students should carry out simple appliance therapy including myofacial appliances for patients. Students should also be able to appreciate the role of Dentofacial growth in the development and treatment of malocclusion. In addition, students should be aware of their limitations on graduation, need to refer patients for consultant opinion and/or treatment and also the need for postgraduate and continuous education programmes.
9. In Paediatric & Preventive Dentistry, the students should concentrate on effective management of the behavior of the child patient to instill a positive attitude, on efficacy of preventive measures and clinical management, including the treatment needs particularly for children with disabilities. In oral medicine and Radiology, the student should receive instruction in various common lesions, occurring in the oral cavity and its diagnosis with particular reference to oral cancer. All students should receive instructions and gain practical experience in taking various types of intra and extra oral radiographs and its processing and interpretation. They should be aware of the hazards of radiation and proper

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protective measures from radiation for the patient, operator and other staff. Since Paediatric dentistry involves the practice of various branches of clinical dentistry, training in Paediatric Dentistry is extended to Part II of the final year.

10. The successful control and management of pain is an integral part of dental practice. Upon graduation the students should be competent to administer all forms of local anesthesia. The value of behavioral methods of anxiety management should be emphasized. The students should also have the practical experience in the administration of intra-muscular and intra-venous injections. Knowledge of pain mechanisms and strategies to control post-operative pain is essential for practice of dentistry.
11. Instruction should be given in dental jurisprudence, legal and ethical obligations of dental practitioners and the constitution and functions of Dental Council of India. Students should be made competent in the management of medico legal cases and death certification.
12. Infection and cross infection control assume significance in dental practice. The students should be made aware of the potential risk of transmission of various infectious diseases particularly HIV and hepatitis in the dental surgery. The students should be aware of their professional responsibility for the protection of the patients, themselves and their staff and the requirements of the health and safety regulations.
13. The subjects of Aesthetic dentistry, Oral Implantology, Behavioral sciences and Forensic Odontology have assumed great significance. Hence, these four specialties are incorporated into the undergraduate curriculum. The instruction and clinical training in aesthetic dentistry shall be carried out by the departments of Prosthodontics and Crown & Bridge and Conservative Dentistry & Endodontics. Similarly, the instruction and clinical training in Oral Implantology shall be done by the departments of Prosthodontics and Crown & Bridge, Oral & Maxillofacial Surgery, and Periodontology. The instruction in behavioral sciences should ideally commence before the students come in contact with the patients and shall be carried out by the departments of Public Health Dentistry and Paediatric and Preventive Dentistry. Forensic Odontology including procedures of death certification will be a part of Oral Pathology & Oral Microbiology, Oral Medicine & Radiology and Oral & Maxillofacial Surgery.

14. With increased life expectancy and treatment facilities, Palliative care has gained importance in the modern world. Palliative medicine is the branch of medicine involved in treatment of patients with advanced, progressive, life-threatening disease for whom the focus of care is maximising their quality of life through expert symptom management, psychological, social and spiritual support as part of a multi-professional team. Understanding the role of dental surgeon in the field of palliative care this subject is introduced in the syllabus to be handled by faculty under public health dentistry trained in palliative care.



2.6 Syllabus

(The syllabus given below is a guideline and is not intended to restrict the student from learning relevant topics not mentioned herein and is not intended to restrict the examiner in assessing the extent of knowledge of the student in the subject)

Contents		Page No.
Syllabus		
1.	Content of each year subject wise	
	1) General Anatomy including Embryology and Histology	18
	2) General Human Physiology	28
	3) Biochemistry	35
	4) Dental Anatomy, Embryology and Oral histology	40
	5) General Pathology	47
	6) General Microbiology	53
	7) Dental Materials	60
	8) General and Dental Pharmacology & Therapeutics	71
	9) Preclinical Conservative Dentistry	76
	10) Preclinical Orthodontics	79
	11) Preclinical Prosthodontics and Crown & Bridge	82
	12) General Medicine	84
	13) General Surgery	87
	14) Oral Pathology & Oral Microbiology	91
	15) Public Health Dentistry	101
	16) Periodontology	110
	17) Oral Medicine & Radiology	118
	18) Orthodontics & Dentofacial Orthopaedics	122
	19) Oral & Maxillofacial Surgery	129
	20) Conservative Dentistry & Endodontics	143
	21) Prosthodontics and Crown & Bridge	154
	22) Paediatric & Preventive Dentistry	161
2.	Year wise split up of hours of study for each subject	170
3.	Subjects taught in each year of course	171
4.	Number of Hours per subject	173
5.	Recommended Books	175

1. GENERAL HUMAN ANATOMY INCLUDING EMBRYOLOGY AND HISTOLOGY

a) GOAL

The students should gain the knowledge and insight into, the functional anatomy of the normal human head and neck, functional histology and an appreciation of the genetic basis of inheritance and disease, and the embryological development of clinically important structures. So that relevant anatomical & scientific foundations are laid down for the clinical years of the BDS course.

b) OBJECTIVES:

i. Knowledge & understanding:

At the end of the 1st year BDS course in Anatomical Sciences the undergraduate student is expected to:

- (1) Know the normal disposition of the structures in the body while clinically examining a patient and while conducting clinical procedures.
- (2) Know the anatomical basis of disease and injury.
- (3) Know the microscopic structure of the various tissues, a pre-requisite for understanding of the disease processes.
- (4) Know the nervous system to locate the site of lesions according to the sensory and or motor deficits encountered.
- (5) Have an idea about the basis of abnormal development, critical stages of development, effects of teratogens, genetic mutations and environmental hazards.
- (6) Know the sectional anatomy of head neck and brain to read the features in radiographs and pictures taken by modern imaging techniques.
- (7) Know the anatomy of cardio-pulmonary resuscitation.

ii. Skills

- 1) To locate various structures of the body and to mark the topography of the living anatomy.
- 2) To identify various tissues under microscope.
- 3) To identify the features in radiographs and modern imaging techniques.
- 4) To detect various congenital abnormalities.

c) INTEGRATION

By emphasizing on the relevant information and avoiding unwanted details, the anatomy taught integrally with other basic sciences & clinical subjects not only keeps the curiosity alive in the learner but also lays down the scientific foundation for making a better doctor, a benefit to the society.

This insight is gained in a variety of ways:

- i. Lectures & small group teaching
- ii. Demonstrations
- iii. Dissection of the human cadaver
- iv. Study of dissected specimens
- v. Osteology
- vi. Surface anatomy on living individual
- vii. Study of radiographs & other modern imaging techniques.
- viii. Study of Histology slides.
- ix. Study of embryology models
- x. Audio-visual aids

Throughout the course, particular emphasis is placed on the functional correlation, clinical application & on integration with teaching in other bio dental disciplines.

d) AN OUTLINE OF THE COURSE CONTENT:

General anatomy: Introduction of anatomical terms and brief outline of various systems of the body.

- i. Regional anatomy of head & neck with Osteology of bones of head & neck, with emphasis on topics of dental importance.
- ii. General disposition of thoracic, abdominal & pelvic organs.
- iii. The regional anatomy of the sites of intramuscular & intra vascular injections, & lumbar puncture.
- iv. General embryology & systemic embryology with respect to development of head & neck.
- v. Histology of basic tissues and of the organs of gastrointestinal, respiratory, Endocrine, excretory systems & gonads.
- vi. Medical genetics

e) **THEORY: 100 HOURS**

<u>THEORY</u>		
	TOPICS	HOURS
1	Introduction to anatomical terms, position, skin, superficial fascia and deep fascia	1
2	Simple epithelium, compound epithelium, Glandular epithelium	1
3	Scalp	1
4	Muscles of facial expression	1
5	Norma verticalis & Norma frontalis	1
6	Norma occipitalis & norma lateralis	1
7	Cervical vertebrae	1
8	Deep cervical fascia	1
9	Development of face	1
10	Brachial plexus	1
11	Classification of joints	1
12	Connective tissue	2
13	Cartilage	1
14	Bone	2
15	Muscle	1
16	Nervous tissue – Neurons, classification, regeneration, optic nerve, sciatic nerve, sensory & autonomic ganglia	2
17	Thyroid gland & development & developmental anomalies	1
18	Lymphatic drainage of head & neck.	1
19	Lacrimal apparatus & eyelid	1
20	Parotid gland & development	1
21	Dural venous sinuses – classification, cavernous sinus in detail	1
22	Pituitary gland and development & anomalies	1
23	Vascular tissue – Large artery, Medium sized artery, Large vein	1
24	Lymphatic tissue	2
25	Skin and its appendages – hair follicle – Sebaceous gland – sweat gland – nail	1
26	Anterior cranial fossa	1
27	Middle cranial fossa	1

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28	Posterior cranial fossa	1
29	Parietal bone	1
30	Occipital bone	1
31	Frontal bone	1
32	Temporal bone	2
33	Norma basalis	2
34	General embryology – oogenesis	1
35	General embryology – spermatogenesis	1
36	General embryology – fertilization	1
37	General embryology – implantation bilaminar	1
38	General embryology – bilaminar germ disc	1
39	General embryology - Neural tube formation, trilaminar germ disc, neural crest, Intraembryonic mesoderm & its fate, Notochord	2
40	General embryology - Folding of embryo	1
41	General embryology - Placenta & foetal membranes	2
42	Pharyngeal pouches & cleft	1
43	Bony orbit	1
44	Muscles of mastication	1
45	Temporomandibular joint	1
46	Hyoglossus muscle and its relations	1
47	Mandible	2
48	Maxilla	2
49	Zygomatic & hyoid bones	1
50	Pharynx	2
51	Nasal cavity & its lateral wall	1
52	Larynx	2
53	Tongue and its development & developmental anomalies	1
54	Middle ear & development	1
55	Coats of the eye – uveal tract in detail	1
56	External features of spinal cord	1
57	Leptomeninges	1
58	Blood supply of brain	1
59	Medulla oblongata– external features	1
60	Pons – external features	1

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61	Cerebellum	1
62	4 th ventricle	1
63	Mid brain – external features	1
64	3 rd ventricle	1
65	Cerebrum – Sulci, gyri and functional area	1
66	Lateral ventricle	1
67	Optic pathway	1
68	White matter of cerebrum and internal capsule	2
69	Basal ganglia	1
70	III Cranial Nerve & IV Cranial nerves	1
71	V Cranial nerve & VI cranial nerves	1
72	VII cranial nerve	1
73	VIII, IX cranial nerves	1
74	X, XI, XII cranial nerves	1
75	Gastrointestinal system	2
76	Respiratory system	2
77	Cardiovascular system	2
78	Excretory system	2
79	Reproductive system – male (1 hr), female (1 hr)	2
80	Medical genetics – Mitosis, Meiosis, Chromosomes and anomalies	1
81	Medical Genetics - Gene structure and genetic disorders	1
82	Medical Genetics - Mode of inheritance	1

सर्वे भयन्तु सुखिनः



Sl. No.	SEMINARS
1.	Submandibular gland
2.	Nasal septum
3.	Soft palate
4.	Auditory tube
5.	Otic ganglion
6.	Pterygopalatine ganglion
7.	Submandibular ganglion
8.	Ciliary ganglion
9.	Ansa cervicalis
10.	Internal and external jugular veins
11.	Subclavian artery
12.	Autonomic nervous system
13.	Paranasal air sinuses
14.	Lingual artery
15.	Circle of Willis
16.	Choroid plexuses of the ventricles

f) **PRACTICAL: 175 HOURS**

Sl. No.	<u>PRACTICALS</u>
HISTOLOGY	
1.	Simple epithelium
2.	Compound epithelium
3.	Glandular epithelium
4.	Connective tissue
5.	Cartilage
6.	Bone
7.	Muscle
8.	Neuron – Optic Nerve - Peripheral Nerve
9.	Ganglia
10.	Blood vessels
11.	Lymphatic tissue – Lymph node, - Spleen, - Thymus, - Tonsil

12.	Skin – Thin skin, Thick skin
13.	Placenta & Umbilical cord
14.	Trachea & lung
15.	Spinal cord, Cerebellum, Cerebrum
16.	Cornea & Retina
17.	Thyroid & Parathyroid gland
18.	Suprarenal & Pituitary glands
19.	Kidney, Ureter, Urinary bladder
20.	Ovary, Corpus luteum, Testis
21.	Tongue – filiform, fungiform, circumvallate papillae
22.	Salivary glands – Mucous – Serous – Mixed
23.	Liver, Pancreas
DISSECTION	
24.	Introduction to dissection
25.	Scalp
26.	Superficial dissection of face – muscles of face
27.	Side of the neck & Posterior triangle
28.	Back of the neck – suboccipital triangle
29.	Anterior triangle
30.	Deep dissection of the neck – Thyroid gland parathyroid gland trachea, oesophagus, Brachiocephalic trunk, Subclavian artery Brachiocephalic vein Thoracic duct. Cervical pleura Neurovascular bundle of the neck, Sympathetic chain, Scalene muscles; Cervical fascia
31.	Lymph nodes & lymph vessels of head & neck
32.	Prevertebral region – Vertebral artery – Vertebral vein
33.	Deep dissection of face – Facial artery – Other vessels - Nerves
34.	Structures in the cheek & lips
35.	Eyelid & lacrimal apparatus
36.	Parotid region
37.	Cranial cavity –meninges Dural folds, Venous sinuses
38.	Anterior cranial fossa
39.	Middle cranial fossa – Pituitary gland
40.	Posterior cranial fossa
41.	Orbit – structures in the orbit

42.	Temporal and infratemporal regions
43.	Submandibular region
44.	Mouth and pharynx
45.	Soft palate and Auditory tube
46.	Cavity of the nose
47.	Larynx
48.	Tongue
49.	Organs of hearing & equilibrium – External ear – Middle ear – Internal ear
50.	Eye ball
51.	Joints of the neck
52.	Spinal Cord
53.	Introduction to brain
54.	Meninges of brain
55.	Blood vessels of brain
56.	Base of brain
57.	Hind brain – Medulla
58.	Hind brain – Pons
59.	Hind brain – Cerebellum
60.	4 th ventricle
61.	Midbrain
62.	Cerebral hemispheres
63.	White matter of cerebrum
64.	3rd ventricle
65.	Lateral ventricle
66.	Thalami – Optic tract
67.	Deep dissection of cerebral hemisphere & Internal capsule
68.	Deep nuclei and connections of thalamus
<u>DEMONSTRATION OF SPECIMENS</u>	
69.	Thoracic wall Chambers of heart Coronary arteries Pericardium
70.	Lungs Pleural cavity Diaphragm
71.	Abdomen –

	Peritoneal cavity Organs in abdominal & pelvic cavities
<u>CLINICAL PROCEDURES</u>	
72.	Intramuscular injections Deltoid muscle Gluteal region Quadriceps femoris
73.	Intravenous injection Median cubital vein Cephalic vein Basilic vein Long saphenous vein Short saphenous vein
74.	Arterial pulsations Superficial temporal Facial Carotid Brachial Radial Femoral Dorsalis pedis Lumbar puncture

सर्वे भयन्तु सुखिनः

g) SCHEME OF EXAMINATION

Distribution of Topics and Type of Questions for University Written examination:

Contents	Types of Questions and Marks	Marks
Questions from any topic included in the theory syllabus	Structured Essays 2x 10marks	20
Questions from any topic included in the theory syllabus Except from the topics from which the long essays have been set	Short Notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	70

i. Theory

University Written

70 Marks

Internal Assessment

10 Marks

Viva Voce:

Examiner 1-Gross Anatomy-

Examiner 2-Osteology, Surface Marking & embryology

20Marks

ii. Practicals:

University Practical Examination:

80 Marks

Gross Anatomy including osteology Spotters (2 mark each) 2x 15 30 Marks

Discussion on Dissected parts (2 Specimens) 2x15 30 Marks

Histology –spotters (10 slides) 2x10 20 Marks

Internal Assessment:

20 Marks

Grand Total 200 Marks

2. GENERAL HUMAN PHYSIOLOGY

a) GOAL

The broad goal of the teaching undergraduate students in Physiology aims at providing the student comprehensive knowledge of the normal functions of the organ systems of the body to facilitate an understanding of the physiological basis of health and disease.

b) OBJECTIVES

i. Knowledge

At the end of the course, the student will be able to:

- (1) Explain the normal functioning of all the organ systems and their interactions for well co-ordinated total body function.
- (2) Assess the relative contribution of each organ system towards the maintenance of the milieu interior.
- (3) List the physiological principles underlying the pathogenesis and treatment of disease.

ii. Skills

At the end of the course, the student shall be able to:

- (1) Conduct experiments designed for the study of physiological phenomena.
- (2) Interpret experimental and investigative data
- (3) Distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

iii. Integration

At the end of the integrated teaching the student shall acquire an integrated knowledge of organ structure and function and its regulatory mechanisms.

c) THEORY: 120 Hours

	Hours
1. GENERAL PHYSIOLOGY	
Homeostasis: Basic concept, Feedback mechanisms Structure of cell membrane, transport across cell membrane Body fluid Compartments: distribution of total body water, intracellular & extracellular compartments, major anions & cations in intra and extra cellular fluid. Membrane potentials. RMP & Action Potential.	4
2. BLOOD:	15
Composition & functions of blood,	

<p>Plasma proteins - Types, concentration, functions & variations, Erythrocyte: Morphology, functions & variations.</p> <p>Erythropoiesis & factors affecting erythropoiesis,</p> <p>ESR- factors affecting, variations & significance.</p> <p>Haemoglobin - Normal concentration, method of determination [P] & variation in concentration, functions</p> <p>Anaemia - Definition, classification, life span of RBC's destruction of RBC's, formation & fate of bile pigments, Jaundice - types.</p> <p>Leucocytes: Classification, number, percentage, distribution morphology, properties, functions & variation. Role of lymphocytes in immunity, life span & fate of leucocytes. [Mention Leukemia]</p> <p>Thrombocytes - Morphology, number, variations, function.</p> <p>Haemostasis – Role of vasoconstriction, platelet plug formation in haemostasis, coagulation factors, intrinsic & extrinsic pathways of coagulation, clot retraction.</p> <p>Fibrinolytic system.</p> <p>Tests of haemostatic function, platelet count, clotting time, bleeding time, prothrombin time - normal values, method & variations. Anticoagulants - mechanism of action.</p> <p>Bleeding disorders.</p> <p>Blood groups: ABO & Rh system, method of determination, importance, indications & dangers of blood transfusion, blood substitutes.[mention only]</p> <p>Blood volume: Normal values, variations.</p> <p>Functions of reticulo-endothelial system.</p> <p>Specific gravity,</p> <p>Packed cell volume,</p> <p>Methods of estimation [in practicals]</p> <p>Blood Indices - MCV, MCH, MCHC - definition, normal values, variation.</p> <p>Leucopoiesis</p> <p>Thrombopoiesis.</p>	
<p>3.MUSCLE AND NERVE</p>	
<p>Classification of nerves,</p> <p>Structure of skeletal muscle - Molecular mechanism of muscle contraction,</p> <p>Neuromuscular junction and NM transmission.</p>	<p>8</p>

Properties of skeletal muscle. Structure and properties of cardiac muscle & smooth muscle.	
4. DIGESTIVE SYSTEM :	
<p>Introduction to digestion: General structure of G.I. tract, Innervation.</p> <p>Salivary glands: Saliva: composition, regulation of secretion & functions of saliva.</p> <p>Stomach: Composition and functions of gastric juice, mechanism and regulation of gastric secretion. HCl secretion. Physiological basis of Peptic ulcer management [briefly]</p> <p>Exocrine Pancreas - Structure, composition of pancreatic juice, functions of each component, regulation of pancreatic secretion.</p> <p>Liver : structure , composition of bile, functions of bile</p> <p>Gall bladder: structure, functions.</p> <p>Small intestine - Composition, functions</p> <p>Large intestine - Functions.</p> <p>Motor functions of GIT: Mastication, deglutition, gastric filling & emptying, movements of small and large intestine, defecation.</p>	10
5. EXCRETORY SYSTEM :	
<p>Structure & functions of kidney, functional unit of kidney & functions of different parts. Juxta Glomerular apparatus. Special functional features of renal circulation.</p> <p>Formation of Urine: Glomerular filtration rate - definition, normal values, factors influencing G.F.R. Tubular reabsorption - Reabsorption of sodium, glucose, water & other substances. Tubular secretion - secretion of urea, hydrogen and other substances. Countercurrent mechanisms.</p> <p>Micturition: anatomy & innervation of Urinary bladder, mechanism of micturition.</p> <p>Determination of GFR.</p> <p>Role of kidney in the regulation of pH of the blood.</p> <p>Urinary bladder: abnormalities.</p>	8
6. SKIN AND TEMPERATURE REGULATION [basics only]	4
7. ENDOCRINOLOGY	
General endocrinology- endocrine glands & hormones. Second messengers.	14

<p>Endocrine function of hypothalamus.</p> <p>Hormones of anterior pituitary & their actions, Disorders of secretion of anterior pituitary hormones.</p> <p>Posterior pituitary hormones: actions</p> <p>Thyroid: secretion & transport of hormones, actions of hormones, regulation.</p> <p>Adrenal cortex & Medulla- action,</p> <p>Other hormones - Angiotensin, local hormones</p> <p>Pancreatic Hormone</p> <p>PTH</p> <p>Endocrine Disorders to be taught with each gland.</p>	
8. REPRODUCTION	
<p>Physiological anatomy of male and female sex organs,</p> <p>Gonadotropic hormones. Sex chromatin.</p> <p>Female reproductive system: Menstrual cycle, functions and hormones of ovary. Ovarian and uterine changes during menstrual cycle. Actions of oestrogen & Progesterone control of secretion of ovarian hormones, fertilization, implantation, maternal changes during pregnancy and parturition.</p> <p>Lactation, milk ejection reflex.</p> <p>Male reproductive system, spermatogenesis, hormones-testosterone. Semen.</p> <p>Contraception.</p>	6
9. CARDIO VASCULAR SYSTEM	
<p>Functional anatomy and innervation of heart. Properties of cardiac muscle.</p> <p>Origin & propagation of cardiac impulse and Pacemaker potential. Action potential.</p> <p>Cardiac cycle - Phases, Pressure changes in atria, ventricles & aorta. Volume changes in ventricles. Heart sounds.</p> <p>Jugular venous pulse</p> <p>Arterial pulse.</p> <p>Electrocardiogram- Basic principles only. Normal electrocardiogram.</p> <p>Heart rate: Normal value, variation.</p> <p>Stroke volume and Cardiac output: definition, normal values, variations, factors affecting.</p> <p>Arterial blood pressure: Definition, normal values, variations, determinants.</p> <p>Regulation of heart rate, stroke volume, blood pressure: integrated concept.</p>	15

<p>Coronary circulation: special features.</p> <p>Cardiac murmurs</p> <p>Cardiac output: one method of determination</p> <p>Cardio vascular homeostasis in exercise & posture.</p>	
10. RESPIRATORY SYSTEM	
<p>Physiology of Respiration: External & internal respiration. Functional anatomy of respiratory passage & lungs. Respiratory movements: Muscles of respiration, Mechanism of inflation & deflation of lungs. Intra pleural & intra pulmonary pressures & their changes during the phases of respiration. Mechanics of breathing - surfactant, compliance & work of breathing [basics only].</p> <p>Spirometry: Lung volumes & capacities definition, normal values, significance, factors affecting vital capacity, variations in vital capacity, Pulmonary ventilation- alveolar ventilation & dead space-ventilation.</p> <p>Pulmonary circulation: Functional features.</p> <p>Composition of inspired air, alveolar air and expired air.</p> <p>Exchange of gases: Diffusing capacity, factors affecting it.</p> <p>Transport of Oxygen & carbon dioxide in the blood. Regulation of respiration- neural & chemical.</p> <p>Hypoxia, cyanosis, dyspnoea, periodic breathing.</p> <p>Artificial respiration.</p> <p>FEV & its variations.</p> <p>Pulmonary function tests</p> <p>Respiratory changes during exercise</p>	12
11. CENTRAL NERVOUS SYSTEM	
<p>Organisation of central nervous system</p> <p>Neuronal organisation at spinal cord level,</p> <p>Synapse: functional significance.</p> <p>Receptors, reflexes, sensations and sensory tracts, motor system</p> <p>Physiology of pain. Referred pain. Analgesia systems.</p> <p>Functions of thalamus, cerebellum.</p> <p>Vestibular apparatus [basics only]</p> <p>Cerebral cortex: Basics of higher functions.</p> <p>Formation and functions of CSF: clinical significance.</p> <p>Autonomic nervous system</p>	10

12. SPECIAL SENSES	14
Fundamental knowledge of vision, hearing, taste and smell.	
Errors of refraction.	
Tests of auditory function	

d) PRACTICALS

The following list of practical is minimum and essential. The entire practical have been categorized as procedures and demonstrations. The procedures are to be performed by the students during practical classes to acquire skills. All the procedures are to be included in the University practical examination. Those categorized as demonstrations are to be shown to the students during practical classes. However these demonstrations would not be included in the University examinations but question based on this would be given in the form of charts, graphs and calculations for interpretation by the students.

Practicals & demonstrations: 60 hours

Practicals	Hours
Study of Microscope and its uses	02
Collection of blood and study of haemocytometer	02
Haemoglobinometry	02
Determination of RB count	08
Determination of WBC count	04
Determination of blood groups	02
Leishman's staining and differential leucocyte count	10
Calculation of blood indices	02
Determination of bleeding time	01
Determination of clotting time	01
Blood pressure recording	03
Auscultation of Heart sounds	02
Demonstrations	
Determination of Erythrocyte Sedimentation rate(ESR)	02
Determination of packed cell volume(PCV)	02
Determination of specific gravity of blood	02
Fragility test for RBC	02
Clinical examination of Cardiovascular and Respiratory System	03
Determination of vital capacity	02
Artificial respiration	02
Demonstration of deep and superficial reflexes	02
Activity of frog's heart and effects of Acetylcholine, Atropine and	02
Electrocardiography: Demonstration of recording of normal Electro	02
Total	60

e) SCHEME OF EXAMINATION

Types of Questions for written examination

Type of Questions	Marks
Structured Essays 1x 10 marks	10
Short Notes 2 x 5 marks	10
Brief Notes 5 x 3 marks	15
Total	35

i. Theory:

University written Examination:	35Marks
University Viva:	10Marks
Internal Assessment:	5 Marks
	Total: 50 Marks

ii. Practicals:

Internal Assessment:	10 Marks
University Practicals:	40Marks
	Total: 50 Marks

Grand Total 100Marks

Mark distribution for University practical examination

Major Experiments: 20Marks

Any one of the Major Experiments: R.B.C. Count, W.B.C. Count, Differential Count, Blood Pressure Recording

Minor Experiments: 15Marks

Any one of the minor Experiments: Determination of Blood Groups, Determination of Bleeding & Clotting time, Haemoglobin Estimation, Calculation of absolute Hematological Indices–MCH, MCV, MCHC

Practical Work record: 5 Marks

3. BIOCHEMISTRY, NUTRITION AND DIETETICS

a) AIMS AND SCOPE

The major aim is to provide a sound but crisp knowledge on the biochemical basis of the life processes relevant to the human system and to dental/medical practice. The contents should be organized to build on the already existing information available to the students in the pre-university stage and reorienting. A mere rehash should be avoided.

The chemistry portion should strive towards providing information on the functional groups, hydrophobic and hydrophilic moieties and weak valence forces that organise macromolecules. Details on structure need not be emphasised.

Discussion on metabolic processes should put emphasis on the overall change, interdependence and molecular turnover. While details of the steps may be given, the student should not be expected to memorise them. An introduction to biochemical genetics and molecular biology is a must but details should be avoided. The exposure to antivitamin, antimetabolites and enzyme inhibitors at this stage, will provide a basis for the future study of medical subjects. An overview of metabolic regulation is to be taught by covering hormonal action, second messengers and regulation of enzyme activities. Medical aspects of biochemistry should avoid describing innumerable functional tests, most of which are not in vogue. Cataloguing genetic disorders under each head of metabolism is unnecessary. A few examples which correlate genotype change to functional changes should be adequate.

At the end of the course the student would be able to acquire a useful core of information, which can be retained for a long time.

b) THEORY: 70 HOURS

No.	TOPIC	HOURS ALLOTTED
1	CARBOHYDRATES	12 hours
	Definition, biological importance and classification. Monosaccharide's –Glucose, fructose, galactose, mannose	1
	Reactions: reducing property, oxidation, osazone, Molisch test. Define anomerism, epimerism with examples.	1
	Disaccharides-lactose, maltose, sucrose, Glycosidic bond, amino sugars, deoxy sugars	1
	Polysaccharides. Structures of starch and glycogen, Mucopolysaccharides (definition, name, components, biochemical	1

	significance. <i>nature of linkages not required</i>) Dietary fibers.	
	Digestion and absorption of carbohydrates. associated disorders(in brief)	1
	Glycolysis, fates of pyruvate Gluconeogenesis.	2
	Glycogenesis, glycogenolysis,	2
	Significance of pentose phosphate pathway. Importance of glucuronic acid.	1
	Regulation of blood glucose. Diabetes mellitus: impaired fasting glucose, impaired glucose tolerance, gestational diabetes mellitus. Evaluation of glycemic status.	2
2	LIPIDS	9 hours
	Definition, biological importance and classification. Fats and fatty acids. Essential fatty acids. Introduction to compound lipids. Cholesterol.	2
	Digestion and absorption of lipids	1
	Beta oxidation of fatty acids	1
	Fatty acid synthesis, (in brief)	1
	Ketone body formation and utilization	1
	Outlines of cholesterol synthesis and compounds formed from cholesterol	1
	Plasma lipoproteins: Formation, function and dyslipidemia, Atherosclerosis.	2
3	ENZYMES	6 hours
	Definition, classification, specificity and active site. Cofactors.	1
	Factors affecting enzyme action	2
	Enzyme inhibition	2
	Clinical important enzymes- AST,ALT,ALP,PSA,LDH,CK,G6PD,GGT	1
4	PROTEINS	9hours
	Amino acids: Classification. Introduction to peptides, peptide bond Proteins: Classification. Charge properties. Buffer action. Levels of protein organization Denaturation.	3
	Digestion and absorption of proteins. Nitrogen balance. Essential amino acids. Protein quality and requirement (methods for	2

	evaluation of protein quality to be excluded). Protein-calorie malnutrition, Balanced diet.(<i>in brief</i>)	
	Formation of Ammonia and Urea cycle.	1
	Reactions of amino acids-transamination, trans methylation, trans sulfuration (<i>in brief</i>)	1
	Compounds formed from glycine	1
	Biologic importance of aromatic amino acids, sulphur containing amino acids, Aminoacidurias (<i>in brief</i>)	1
5	INTEGRATION OF METABOLISM High energy compounds, Electron transport chain and oxidative phosphorylation.	2hours
6	VITAMINS	5 hours
	Fat soluble vitamins A,D,E,K, sources, functions, daily requirements, deficiency, Toxicity	2
	Water soluble vitamins B, C, sources, functions, daily requirements, deficiency, Toxicity	3
7	ACID BASE BALANCE Buffers, respiratory and renal regulation, disorders, analysis	4hours
8	MINERALS	6hours
	Classification, daily requirement. Calcium and phosphorous: sources, uptake, excretion, function. Serum calcium regulation.	2
	Iron: sources, uptake and transport. Heme and nonheme iron functions; deficiency	2
	Iodine: Brief introduction to thyroxine synthesis. General functions of thyroxine. Fluoride: function, deficiency and excess	1
	Indications of role of other minerals	1
9	HAEMOGLOBIN	3 hours
	Structure, synthesis, degradation	1
	Hemoglobinopathies	1
	Jaundice	1
10	PLASMA PROTEINS Classification and separation. Functions of albumin.	2 hours

	immunoglobulins. Biochemistry of AIDS.	
11	LIVER FUNCTION TESTS	1 hours
12	KIDNEY FUNCTION TESTS	1 hours
	MOLECULAR BIOLOGY	8 hours
	Nucleic acids: Building units. Nucleotides. Outline structure of DNA and RNA.	2
13	Formation and degradation of nucleotides. (<i>in brief</i>) Gout. Lesch-nyhan syndrome	2
	Replication. Transcription. (<i>in brief</i>) Antimetabolites and antibiotics interfering in replication, transcription	2
	Outline of translation process.	2
14	Techniques-colorimetry, ELISA, RIA	2 hours

c) PRACTICALS, DEMONSTRATION & SEMINAR: 60 hours

i. Practical: 45 hours

Sl.No.	Procedure	Hours
1.	Introduction to lab procedures	1
2.	Normal & abnormal constituents of urine	12
3.	Introduction to clinical chemistry	2
4.	Estimation of blood urea	2
5.	Estimation of serum protein	2
6.	Estimation of blood sugar	2
7.	Estimation of serum creatinine	2
8.	Estimation of serum albumin	2

ii. Demonstration: 20 hours

Sl.No.	Procedure	Hours
1.	Electrophoresis	2
2.	Chromatography	2
3.	GTT charts	2
4.	LFT charts	2
5.	Revision	3

iii. Seminars: 15 hours

d) SCHEME OF EXAMINATION

Types of Questions for written examination

Type of Questions	Marks
Structured Essays 1x 10 marks	10
Short Notes 2 x 5 marks	10
Brief Notes 5 x 3 marks	15
Total	35

i. **Theory:**

University written Examination: 35Marks

University Viva: 10Marks

Internal Assessment: 5 Marks

Total: 50 Marks

ii. **Practicals:**

Internal Assessment: 10 Marks

University Practicals: 40Marks

Total: 50 Marks

Grand Total 100Marks

Mark distribution for University practical examination;

One procedure for quantitative estimation 15marks

One procedure for qualitative analysis 20marks

Practical Work record: 5 Marks

The following Procedures are suggested for University Practical Examination:

Quantitative Estimation (Any ONE estimation to be done)

Estimation of blood sugar/serum creatinine/blood urea/serum protein/serum albumin

Qualitative Analysis (Any ONE analysis to be done)

Urine Analysis—normal constituents

Report of abnormal urine

4. DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY.

a) INTRODUCTION:

The course includes instructions in the subject of Dental Morphology, Oral Embryology, Oral Histology and Oral Physiology. A composite study of basic Dental Sciences & their clinical applications.

b) SKILLS

The student should acquire basic skills in:

- i. Carving of crowns of permanent teeth in wax.
- ii. Microscopic study of Oral tissues.
- iii. Identification of Deciduous & Permanent teeth
- iv. Age estimation by patterns of teeth eruption from plaster casts of different age groups.

c) OBJECTIVES

After a course on Oral Biology,

- i. The student is expected to appreciate the normal development, morphology, structure & functions of oral tissues & variations in different pathological/non-pathological states.
- ii. The student should understand the histological basis of various dental treatment procedures and physiologic ageing process in the dental tissues.
- iii. The students must know the basic knowledge of various research methodologies

d) COURSE CONTENT

i. Theory: 105 hours

DENTAL ANATOMY	HOURS
1. Introduction, Dental Anthropology & Comparative Dental Anatomy	3
2. Function of teeth.	
3. Nomenclature.	
4. Tooth numbering systems (Different system)(Dental formula).	
5. Chronology of deciduous and permanent teeth. (First evidence of calcification, crown completion, eruption and root completion).	2
6. Deciduous teeth - a) Nomenclature. b) Importance of deciduous teeth. c) Form & function, comparative dental anatomy, fundamental curvature	4
7. Gross morphology of deciduous teeth.	5
8. General differences between deciduous and permanent teeth.	1
9. Morphology of permanent teeth. Chronology, measurements, description of individual surface and	12

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variations of each tooth.	
10. Morphological differences between incisors, premolars and molars of same arch.	1
11. Morphological differences between maxillary and mandibular. incisors, canines, premolars and molars of the opposite arch	1
12. Internal Anatomy of Pulp.	1
13. Occlusion: a. Development of occlusion. b. Dental arch form. c. Compensating curves of dental arches. d. Angulations of individual teeth in relation to various planes. e. Functional form of the teeth at their incisal and occlusal thirds. f. Facial relations of each tooth in one arch to its antagonist or antagonists in the opposing arch in centric occlusion. g. Occlusal contact and interscusp relations of all the teeth of one arch with those in the opposing arch in centric occlusion. h. Occlusal contact and intercusp relations of all the teeth during the various functional mandibular movements. i. Neurobehavioral aspect of occlusion	8
14. Temporo Mandibular Joint (T.M.J.): Gross Anatomy and articulation. Muscles (Muscles of mastication). Mandibular position and movements. Histology. Clinical considerations with special emphasis on Myofascial Pain Dysfunction Syndrome (MPDS) - (Desirable to Know)	2
ORAL PHYSIOLOGY	
1. Theories of calcification	1
2. Mastication and deglutition	1
Oral Embryology, Anatomy and Histology:	
1. Development and growth of face and jaws.	1
2. Development of tooth.	3
3. Cranial nerves with more emphasis on V, VII and IX.	1
4. Blood supply, nerve supply and lymphatic drainage of teeth and surrounding structures	1
5. Cell - structure and function	1

6. Maxillary sinus - Structure, Variations, Histology function and clinical considerations	2
7. Salivary Glands - Classification, structure, function, Histology, Clinical Considerations and age changes.	4
8. Oral Mucous membrane: Definitions, General consideration. Functions and classifications. Structure and microscopic appearance of gingiva, palate, lips, alveolar mucosa, tongue, floor of mouth. Gingival sulcus and dentogingival junction. Clinical considerations and age changes.	8
9.ENAMEL: Physical characteristics, chemical properties structure. Development - Life cycle of ameloblasts, Amelogenesis and Mineralisation. Clinical considerations. Age changes.	8
10.DENTIN: Physical characteristics, chemical properties, structure. Types of dentin. Dentin innervation and hypersensitivity. Development - Dentinogenesis and mineralisation. Clinical considerations. Age Changes.	6
11.PULP: Anatomy, structural features, functions, pulp organs. Developments. Clinical consideration Age changes.	6
12.CEMENTUM: Physical characteristics, chemical properties, structure. Cementogenesis. Clinical consideration Age changes.	4
13.PERIODONTAL LIGAMENT: Cells and fibers, Functions, Development, Clinical Considerations., Age Changes	5
14.ALVEOLAR BONE: Physical characteristics, chemical properties structure. Structure, Development., Internal reconstruction, Clinical consideration.	5
Tissue processing & Histochemistry	4
THEORIES OF ERUPTION AND SHEDDING. (Physiological tooth movement)	4

ii. **Practical: 250 Hours**

DENTAL ANATOMY:

Carving on wax blocks:-

- a. Individual tooth - Only permanent teeth of both arches.
- Central, Incisors, Lateral, Canines, Premolars and 1st and 2nd molars

HISTOLOGY:

List of Histology slides:

Development of tooth:

- 01. Bud stage of tooth development.
- 02. Cap stage of tooth development.
- 03. Early bell stage of tooth development.
- 04. Late Bell stage of tooth development.
- 05. Root formation.

ENAMEL:

- 01. Enamel rod.
- 02. Hunter-Schreger Bands
- 03. Tufts, Lamellae, Spindles.
- 04. Incremental lines of Retzius.
- 05. Neonatal line.
- 06. Gnarled Enamel.

DENTIN:

- 01. Dentino - Enamel junction.
- 02. Dentinal Tubules.
- 03. Incremental lines of Von Ebner.
- 04. Contour lines of Owen.
- 05. Neonatal line.
- 06. Tomes granular layer.
- 07. Interglobular Dentin.
- 08. Secondary Dentin.
- 09. Intratubular Dentin.
- 10. Intertubular Dentin.

CEMENTUM:

- 01. Cellular cementum.

02. Acellular cementum.

03. Cemento enamel junction

- Type 1 - 60% type - Overlapping.

- Type 2 - 30% type - Butt

- Type 3 - 10% type - Cementum & Enamel do not meet.

04. Sharpey's fibers.

05. Hypercementosis.

PULP:

01. Zones of Pulp.

02. Pulp stones.

PERIODONTAL LIGAMENT:

01. Principle fibers of Periodontal ligament

- Apical, Horizontal, Oblique, Alveolar crest, Interradicular, Transeptal

ALVEOLAR BONE:

01. Haversian system.

02. Trabeculated bone.

03. Mature and immature bone.

SALIVARY GLANDS:

01. Mucous gland.

02. Serous gland.

03. Mixed gland.

MAXILLARY SINUS:

Sinus lining (Pseudostratified ciliated columnar)

(Desirable to know)

ORAL MUCOUS MEMBRANE:

01. Parakeratinised epithelium.

02. Orthokeratinised epithelium.

03. Palate - Anterolateral zone.

04. Palate - Posterolateral zone.

05. Alveolar mucosa.

06. Vermilion border of lip.

07. Tongue - Circumvallate Papillae.

- Fungiform Papillae

- Filiform Papillae

Preparation of Ground sections, haematoxylin & Eosin sections & decalcified section

iii. Lecture demonstration:

Identification of Individual teeth

- (1) Deciduous
- (2) Permanent
- (3) Mixed dentition using study models
- (4) Demonstration of preparation of ground section, Decalcification, Paraffin section and H & E Staining.



e) SCHEME OF EXAMINATION

Distribution of Topics and Type of Questions for University written examination

Contents	Type of Questions and Marks	Marks
Dental anatomy - one question - 14 marks Detailed morphology of Permanent teeth, Differences between Primary & Permanent teeth, Occlusion and Arrangement of teeth. B. Oral histology - one question - 14 marks Development of tooth, Enamel-structure & development, Dentin-structure& development, Cementum, Dental pulp-structure & histology, Periodontal ligament, Alveolar bone-structure & histology, Oral mucosa-structure & histology, Eruption of teeth	Structured Essays 2x 10marks	20
A. Oral histology - two questions - 16 marks B. Dental anatomy - one question - 08 marks C. Oral physiology - one question - 08 marks	Short notes 4 x 5marks	20
A. Oral histology - five questions - 20 marks B. Dental anatomy - three question - 12 marks C. Oral physiology - one question - 04 marks D. Oral embryology - one question - 04 marks	Brief Notes 10x3marks	30
	Total	70

i. Theory

University written Examination:	70Marks
University Viva:	20Marks
Internal Assessment:	10 Marks

ii. Practicals:

Internal Assessment:	20 Marks
University Practicals:	80Marks
Grand Total	200 Marks

Mark Distribution for University Practical Examination:

Tooth Carving:	(Time allotted 75 Minutes)	25 Marks
Spotters:	(15X3 marks)	45 Marks
Practical work Record:		10 marks

Type of Spotters:

- 8 Histology and Ground Section slides
- 5 Tooth identification
- 2 Casts for identification of teeth, numbering system and age assessment

5. GENERAL PATHOLOGY

a) AIM:

At the end of the course the student should be competent to: Apply the scientific study of disease processes, which result in morphological and functional alterations in cells, tissues and organs to the study of pathology and the practice of dentistry.

b) OBJECTIVES:

Enabling the student

- i. To demonstrate and analyze pathological changes macroscopically explain their observations in terms of disease processes.
- ii. To integrate knowledge from the basic sciences, clinical medicine and dentistry in the study of Pathology.
- iii. To demonstrate understanding of the capabilities and limitations of morphological Pathology in its contribution to medicine, dentistry and biological research.
- iv. To demonstrate ability to consult resource materials outside lectures, laboratory and tutorial classes.

c) COURSE CONTENT:

i. Theory: 55Hours

Sl. No.	TOPIC	HOURS ALLOTTED
1	Introduction , Terminologies, The cell in health, The normal cell structure, The cellular functions	1
2	Etiology and Pathogenesis of disease, Cell Injury Types - congenital, Acquired Mainly Acquired causes (Hypoxic injury, chemical injury, physical injury, immunological injury) Cell death& Necrosis Apoptosis, definition, causes, features and types of necrosis Gangrene - Dry, wet, gas Pathological Calcifications (Dystrophic and metastatic)	3
3	Degenerations, Amyloidosis, Fatty change, Cloudy swelling, Hyaline change, mucoid degeneration	2
4	Inflammation, Definition, causes types, and features, Acute inflammation, The vascular response, The cellular response, Chemical mediators, The inflammatory cells Fate, Chronic inflammation, Granulomatous inflammation	3

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5	Healing Regeneration, Repair Mechanisms, Healing by primary intention, Healing by secondary intention, Fracture healing, Factors influencing healing process, Complications	3
6	Immunological mechanisms in disease Humoral & cellular immunity Hypersensitivity & autoimmunity	2
7	Infections & infestations (1) Syphilis: Epidemiology, Types and stages of syphilis, Pathological, features, Diagnostic criteria, Oral lesions (2) Typhoid, Epidemiology, Pathogenesis, Pathological features, Diagnostic criteria, Thrombosis (3) Tuberculosis, Epidemiology, Pathogenesis, (Formation of tubercle), Pathological, features of Primary and secondary TB, Complications and Fate (4) AIDS & Hepatitis (5) Actinomycosis (6) Candidiasis (7) Mucormycosis (8) Pyogenic infections	6
8	(1) Disorders of circulation, Hyperemia, Shock (2) Definition, Pathophysiology, Formation, complications & Fate of a thrombus (3) Embolism, Definition, Types, Effects (4) Ischemia and Infarction, Definition, etiology, types, Infraction of various organs (5) Derangements of body fluids, Oedema - Pathogenesis, Different types	4
9	Nutritional Disorders, starvation, obesity, malnutrition, pathogenesis of deficiency diseases with special reference to disorders of vitamins & minerals	3
10	Diabetes Mellitus, Definition, Classification, Pathogenesis, Pathology in different organs	2
11	Hypertension, Definition, classification, Pathophysiology, Effects in various organs	2
12	Brief introduction to growth & differentiation Adaptive disorders of	1

	growth, Atrophy & Hypertrophy, Hyperplasia, Metaplasia and Dysplasia	
13	General Aspects of neoplasia, Definition, terminology, classification, Differences between benign and malignant neoplasms, The neoplastic cell, Metastasis, Etiology and pathogenesis of neoplasia, Carcinogenesis, Tumour biology, Oncogene and anti-oncogenes, Diagnosis, Precancerous lesions, Common specific tumours, Sq papilloma & Ca, Basal cell Ca, Adenoma & Adenocarcinoma, Fibroma & Fibrosarcoma, Lipoma and liposarcoma	4
14	Common diseases of Bones, Osteomyelitis, Metabolic bone diseases, Bone Tumours, Osteosarcoma, Osteocalstoma, Giant cell Tumour, Ewing's sarcoma, Fibrous dysplasia, Aneurismal bone cyst	3
15	Diseases of oral cavity, Lichen planus, Stomatitis, Leukoplakia, Squamous cell Ca, Dental caries, Dentigerous cyst, Ameloblastoma Diseases of salivary glands, Normal structure, Sialadenitis & Tumours	4
16	Diseases of Cardiovascular system Cardiac failure, Congenital heart disease ASD, VSD, PDA, Fallot's Tetralogy, Infective Endocarditis, Atherosclerosis, Ischaemic heart Disease	2
17	Introduction to haematology , haemopoiesis, bone marrow aspiration & biopsy, Anaemias, classification, Iron Deficiency anaemia, Megaloblastic anaemia, hemolytic anaemias and their lab investigations, Polycythemia.	3
18	Haemorrhagic Disorders, Coagulation cascade Coagulation disorders Platelet function, Platelet disorders	3
19	Diseases of WBC's pathologic variations in white blood cell counts and leukemoid reactions, Leukaemias, Acute and chronic leukaemias, Diagnosis and clinical features Diseases of Lymph nodes, Hodgkin's disease, Non Hodgkins lymphoma, Metastatic carcinoma	4

ii. Practicals and lecture demonstrations: 55 hours

(1) Lecture demonstrations: 10 Hours

- a) Anti coagulants, Blood indices
- b) PCV & ESR

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- c) Instruments & their uses:
 - (i) Neubauer's Counting chamber
 - (ii) Haemoglobinometer
 - (iii) W.B.C Pipette
 - (iv) Wintrobe Tube
 - (v) Urinometer
- d) Cytologic Techniques- FNAC and buccal smear
- e) Study of anaemias- Microcytic, Macrocytic and Dimorphic blood picture
- f) Study of Acute leukemias- Any one type
- g) Study of Chronic Leukemias- Any one type

(2) Histopathology Slides & Specimens: 20 Hours

- a) Tissue Processing, Staining
- b) Histopathology slides
 - (i) Acute appendicitis,
 - (ii) Granulation tissue,
 - (iii) fatty liver
 - (iv) CVC lung, CVC liver, CVC spleen
 - (v) Kidney amyloidosis
 - (vi) Tuberculosis,
 - (vii) Actinomycosis,
 - (viii) Rhinosporidiosis
 - (ix) Squamous cell papilloma,
 - (x) Transitional cell papilloma,
 - (xi) Pleomorphic adenoma
 - (xii) Basal cell carcinomas
 - (xiii) Squamous cell carcinoma
 - (xiv) Osteosarcoma,
 - (xv) osteoclastoma,
 - (xvi) fibrosarcoma
 - (xvii) Malignant melanoma,
 - (xviii) Ameloblastoma,
 - (xix) Adenocarcinoma
 - (xx) Pleomorphic adenoma

- (xxi) Metastatic carcinoma in lymph node
- (xxii) Capillary and cavernous haemangioma
- (xxiii) Fibroma
- (xxiv) Neurofibroma
- (xxv) Lipoma
- (xxvi) Osteoma, chondroma

c) Specimens

- (i) Acute Appendicitis.
- (ii) Tuberculosis Lymphnode.
- (iii) Fatty liver.
- (iv) Infarction spleen.
- (v) Chronic Venous Congestion (C.V.C.) Liver
- (vi) Squamous papilloma
- (vii) Basal cell carcinoma
- (viii) Lipoma
- (ix) Squamous cell carcinoma
- (x) Malignant Melanoma
- (xi) Adenocarcinoma
- (xii) Osteosarcoma
- (xiii) Osteoclastoma.
- (xiv) Gangrene.

(3) Practicals that must be done by the students: 25hrs.

- (i) Determination of Haemoglobin percentage
- (ii) Blood grouping.
- (iii) Total Leukocyte count
- (iv) Bleeding time , Clotting time
- (v) Peripheral blood smear staining and study
- (vi) Differential leukocyte count.
- (vii) Urine examination- for sugar, ketone bodies, protein, blood, bile pigments and bile salts- any one standard test

d) SCHEME OF EXAMINATION

i. Theory:

Distribution of Topics and Type of Questions for written examination

Contents	Types of Questions and Marks	Marks
Question from General Pathology Inflammation, Healing and Repair, Tuberculosis, Leprosy, Syphilis, Thrombosis, Neoplasia, Diseases of bone, Cell injury, metabolic disturbances, Circulatory disturbances, Hypertension, diseases of oral cavity	Structured Essay 1x 10marks	10
Two questions from General Pathology Intracellular accumulations, Necrosis, Gangrene, Apoptosis, Amyloidosis, Pathologic calcification, hypersensitivity reactions, Infections, Shock, Oedema, Infarction, Congestion, Hypertension, Diabetes Mellitus, Premalignant Conditions, Neoplasia, Osteomyelitis, Anaemias, Neoplastic Proliferation of WBCs–Leukaemias and Lymphomas, Haemorrhagic disorders, Erythrocyte Sedimentation Rate(ESR),Urine sediment. Two from Haematology One from Clinical Pathology	Short Notes 2 x 5marks Brief notes 5 x 3	10 15
	Total	35

i. Theory:

University written Examination:	35Marks
University Viva:	10Marks
Internal Assessment:	5 Marks
	Total: 50 Marks

ii. Practicals:

Internal Assessment:	10 Marks
University Practicals:	40Marks
	Total: 50 Marks

Grand Total 100Marks

Mark distribution for University practical examination

Spotters

Haematology slide	2x 2marks
Histopathology slides	5x2marks
Specimens	2x2marks
Instruments	1x2marks

Any three of the following exercises to be evaluated:

To examine given sample of urine for abnormal constituents	} 3x 5 marks
To do differential count on the given peripheral blood smear	
To estimate haemoglobin percentage in the given sample of blood	
To determine blood groups (ABO and Rh) in the given sample of blood	

Practical work record 5marks

6 GENERAL MICROBIOLOGY

a) AIMS:

Introduce the students to the exciting world of microbes. To make the students aware of various branches of microbiology and the role of microbes in human diseases. The objectives of teaching microbiology can be achieved by various teaching techniques such as:

Lectures

Lecture Demonstrations

Practical exercises

Audio visual aids

Small group discussions with regular feedback from the students to be arranged.

b) OBJECTIVES:

i. Knowledge and Understanding

At the end of the Microbiology course the student is expected to:

- (1) Understand the basics of various branches of microbiology and able to apply the knowledge relevantly.
- (2) Apply the knowledge gained in related medical subjects like General Medicine and General Surgery and Dental subjects like Oral Pathology, Public Health Dentistry, Periodontics, Oral Surgery, Pedodontics, Conservative Dentistry and Oral medicine in higher classes.
- (3) Understand and practice various methods of Sterilisation and disinfection in dental clinics.
- (4) Have a sound understanding of various infectious diseases and lesions in the oral cavity.

ii. Skills

- (1) Student should have acquired the skill to diagnose, differentiate various oral lesions.
- (2) Should be able to select, collect and transport clinical specimens to the laboratory.
- (3) Should be able to carry out proper aseptic procedures in the dental clinic.

c) COURSE CONTENT:

A brief syllabus of Microbiology is given as follows:

i. General microbiology:

- (1) History, Introduction, Scope, Aims and Objectives.
- (2) Morphology and Physiology of bacteria.
- (3) Detail account of Sterilisation and Disinfection.
- (4) Brief account of Culture media and Culture techniques.

- (5) Basic knowledge of selection, collection, transport, processing of clinical specimens and identification of bacteria.
- (6) Bacterial Genetics and Drug Resistance in bacteria.

ii. Immunology:

- (1) Infection - Definition, Classification, Source, Mode of transmission and types of Infectious disease.
- (2) Immunity
- (3) Structure and functions of Immune system
- (4) The Complement System
- (5) Antigen
- (6) Immunoglobulins - Antibodies - General structure and the role played in defense mechanism of the body.
- (7) Immune response
- (8) Antigen - Antibody reactions - with reference to clinical utility.
- (9) Immuno deficiency disorders - a brief knowledge of various types of immuno deficiency disorders - A sound knowledge of immuno deficiency disorders relevant to dentistry.
- (10) Hypersensitivity reactions
- (11) Autoimmune disorders - Basic knowledge of various types - sound knowledge of autoimmune disorders of oral cavity and related structures.
- (12) Immunology of Transplantation and Malignancy
- (13) Immune haematology

iii. Systematic bacteriology:

- (1) Pyogenic cocci - Staphylococcus, Streptococcus, Pneumococcus, Gonococcus and Meningococcus - brief account of each coccus - detailed account of mode of spread laboratory diagnosis, Chemo therapy and prevention.
- (2) Detailed account of Cariogenic Streptococci
- (3) Corynebacterium diphtheriae - mode of spread, important clinical feature, Laboratory diagnosis, Chemotherapy and Active immunisation.
- (4) Mycobacteria - Tuberculosis and Leprosy
- (5) Clostridium - Gas gangrene, food poisoning and tetanus.
- (6) Non-sporing Anaerobes - in brief about classification and morphology, in detail about dental pathogens - mechanism of disease production and prevention.
- (7) Spirochaetes - Treponema pallidum - detailed account of Oral Lesions of syphilis, Borrelia vincentii, Actinomycetes.

iv. Virology:

- (1) Introduction
- (2) General properties, cultivation, host - virus interaction with special reference to Interferon.
- (3) Brief account of Laboratory diagnosis, Chemotherapy and immuno prophylaxis in general.
- (4) A few viruses of relevance to dentistry.
 - a) Herpes Virus
 - b) Hepatitis B Virus - brief about other types
 - c) Human Immunodeficiency Virus (HIV)
 - d) Mumps Virus
 - e) Brief- Measles and Rubella Virus
- (5) Bacteriophage - structure and Significance

v. Mycology:

- (1) Brief Introduction
- (2) Candidosis - in detail
- (3) Briefly on oral lesions of systemic mycoses.

vi. Parasitology:

- (1) Brief introduction - protozoans and helminthes
- (2) Brief knowledge about the mode of transmission and prevention of commonly seen parasitic infection in the region.

d) Theory: 65 Hours

Topics		Hours
I.GENERALBACTERIOLOGY		
1.	Introduction, History and classification.	02
2.	Morphology, Physiology of Bacterial cell.	02
3.	Bacterial Genetics	02
4.	Infection	02
II.IMMUNOLOGY		
1.	Immunity	02
2.	Antigen	01
3.	Antibodies	01
4.	Structures and functions of Immune system	01
5.	Immune response	01
6.	Antigen and antigen reactions &compliment	04
7.	Hypersensitivity	02
8.	Autoimmunity	01

9.	Immunology of transplantation	01
III.SYSTEMATICBACTERIOLOGY		
1.	Staphylococci	01
2.	Streptococci (Dental Caries)	02
3.	Pneumococci	01
4.	Meningococci &Gonococci	01
5.	Corynebacterium diphtheria	02
6.	Bacillus	01
7.	Clostridia	02
8.	Non sporing Anaerobes	02
9.	Mycobacteria	03
10.	Spirochaetes (Treponema, leptospira and Borrelia)	03
11.	Normal bacterial flora of the Oral Cavity	01
IV.VIROLOGY		
1.	General properties of viruses	03
2.	Herpes viruses	02
3.	Measles and Mumps	01
4.	Rabies virus.	01
5.	Hepatitis viruses	02
6.	Human Immunodeficiency Virus(HIV)	01
7.	Oncogenic viruses &Poliomyelitis	02
V. PARASITOLOGY		
1.	Introduction to parasitic diseases	01
2.	Entamoeba histolytica, Malaria, Leishmania	03
VI. MYCOLOGY		
1.	Candidiasis (in detail)	02
2.	Rhinosporidiosis	02
VII.APPLIEDMICROBIOLOGY		
1.	Immunisation schedule, Collection of materials, Experimental animals &hospital infections – in brief	02

vii. Practicals/Demonstrations: 50 Hours

(1) Demonstrations:

- a) Morphological forms of microbes
- b) Different morphological forms of bacteria, viruses, fungi, parasites.
- c) Sterilization Methods – Specified techniques – their uses.
- d) Culture Media – transport media
- e) Special staining techniques, stained preparations – dark ground microscopy.
- f) Demonstration of bacteria in stained clinical material.
- g) Demonstration of viruses – Permanent preparations morphology, inclusion bodies.

- h) Demonstration of parasite – in blood smear – in stool – in urine.
- i) Demonstration of common fungi – candida – Dermatophytes.

(2) Practicals:

- a) Simple staining of bacteria
- b) Gram's staining – isolated bacteria – Clinical materials.
- c) Ziehl-Neelsen staining – prepared and fixed smears.
- d) Collection of materials for culture – pus, blood.

(3) List of practical materials slides for demonstration:

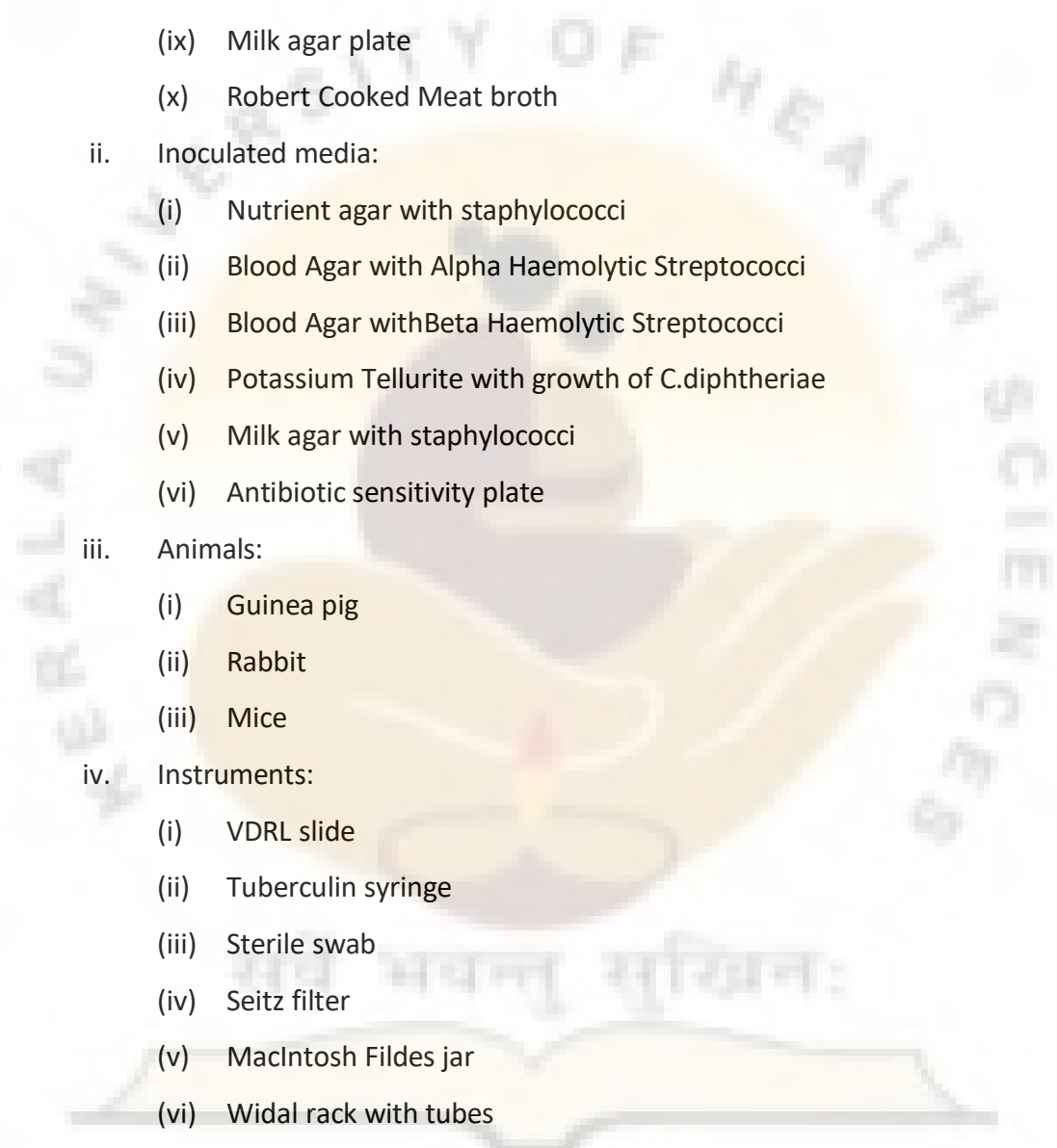
- a) Staphylococcus
- b) Streptococcus
- c) Gonococcus
- d) Pneumococcus
- e) Mycobacterium Tuberculosis
- f) Mycobacterium leprae
- g) Anthrax
- h) Cl. Tetani
- i) Spirochaetes
- j) Gram Negative Bacilli
- k) Candida
- l) Actinomyces

(4) Slides for practical exercises:

- a) Grams stains**
 - (i) Staphylococci
 - (ii) Gram negative bacilli
 - (iii) Mixture of any two organisms
 - (iv) Gram stain of the oral cavity
- b) Albertsstain–Kleb's Löffler's Bacilli(KLB)culture, slide**
- c) Ziehl-Neelson'sstain -Sputum positive for AFB**

(5) Media for demonstration:

- i. Un-inoculated media:
 - (i) Nutrient agar plate

- 
- (ii) Blood agar plate
 - (iii) Chocolate agar plate
 - (iv) Macconkey agar plate
 - (v) Glucosecitrate broth(Blood culture bottle)
 - (vi) Lowenstein Johnson's Mediaslope
 - (vii) Loefflers serum slope
 - (viii) Sabourauds slope
 - (ix) Milk agar plate
 - (x) Robert Cooked Meat broth
- ii. Inoculated media:
- (i) Nutrient agar with staphylococci
 - (ii) Blood Agar with Alpha Haemolytic Streptococci
 - (iii) Blood Agar with Beta Haemolytic Streptococci
 - (iv) Potassium Tellurite with growth of C.diphtheriae
 - (v) Milk agar with staphylococci
 - (vi) Antibiotic sensitivity plate
- iii. Animals:
- (i) Guinea pig
 - (ii) Rabbit
 - (iii) Mice
- iv. Instruments:
- (i) VDRL slide
 - (ii) Tuberculin syringe
 - (iii) Sterile swab
 - (iv) Seitz filter
 - (v) MacIntosh Fildes jar
 - (vi) Widal rack with tubes
 - (vii) Microtitre plate
 - (viii) Disposable syringe
 - (ix) Surgical gloves

e) SCHEME OF EXAMINATION

i. Theory

Distribution of Topics and Type of Questions for University written examination:

Contents	Type of Questions and Marks	Marks
One Long Essay question from Systematic Bacteriology	Structured Essay 1 x 10marks	10
One question from General bacteriology One question from Immunology One question from Mycology One question from Parasitology / Oral Microbiology One question from Systematic Bacteriology	Short notes 2 x 5marks	10
One question from General bacteriology One question from Immunology One question from Systematic Bacteriology Two questions from Virology	Brief Notes 5x3marks	15
	Total	35

iii. Theory:

University written Examination:	35Marks
University Viva:	10Marks
Internal Assessment:	5 Marks
	Total: 50 Marks

iv. Practicals:

Internal Assessment:	10 Marks
University Practicals:	40Marks
	Total: 50 Marks
	Grand Total 100Marks

Mark distribution for University practical examination

Spotters

Slides	5x 2 Marks
Media	3x2 Marks
Instruments	2x2 Marks
Gram's Stain	7 Marks
Ziehl-Neelsen's Stain	8 Marks
Practical work record	5 Marks

7 DENTAL MATERIALS

a) INTRODUCTION:

The science of Dental Material has undergone tremendous changes over the years. Continued research has led to new material systems and changing concepts in the dental field. Interlinked with various specialized branches of chemistry, practically all engineering applied sciences and biological characteristics, the science of dental material emerged as basic sciences in itself with its own values and principles.

b) AIMS:

Aim of the course is to present basic chemical and physical properties of Dental materials as they are related to its manipulation to give a sound educational background so that the practice of the dentistry emerged from art to empirical status of science as more information through further research becomes available. It is also the aim of the course of Dental materials to provide with certain criteria of selection and which will enable to discriminate between facts and propaganda with regards to claims of manufactures.

c) OBJECTIVES:

To understand the evolution and development of science of dental materials. Impart knowledge of physical and chemical properties and advantages and disadvantages of various materials used in dentistry. Acquire knowledge of biomechanical requirements of particular restorative material and its application & limitations. Laying down standards or specifications of various materials to guide to manufacturers as well as to help professionals. Search for newer and better materials which may answer our requirements with greater satisfaction. To understand and evaluate the claims made by manufactures of dental materials.

At the end of the course the student should have the knowledge about the composition, properties, manipulative techniques and their various commercial names. The student should also acquire skills to select and use the materials appropriately for laboratory and clinical use.

d) NEED FOR THE COURSE:

The profession has to raise from an art to a science, the need for the dentist to possess adequate knowledge of materials to exercises his best through knowledge of properties of different types of materials. There is growing concern of health hazards due to mercury toxicity, inhalation of certain vapors or dust materials, irritations and allergic reaction to skin due to contact of materials. The Dentist must acquire wider knowledge of physical, chemical and biological properties of the various materials used in the mouth because they may cause irritation of oral tissues. pH of some of the restorative materials causes inflammation and

necrosis of pulp which is a concern and the patient should be protected from these. Certain criteria of selection are provided that will enable the dentist to discriminate between facts and propaganda, which will make a material biologically acceptable.

e) SCOPE:

Dental materials are employed in mechanical procedures including restorative dentistry such as Prosthodontics, Endodontics, Periodontics and Orthodontics. There is scarcely a dental procedure that does not make use of dental materials in one form or another and therefore the application of dental material is not limited to any one branch of dentistry. Branches such as minor surgery and Periodontics require less use of materials but the physical and chemical characters of materials are important in these fields. The toxic and tissue reaction of dental materials and their durability in the oral cavity where the temperature is between 32 & 37 degree centigrade, and the ingestion of hot or cold food ranges from 0-70 degree centigrade. The acid an alkalinity of fluids shown pH varies from 4 to 8.5. The load on 1 sq. mm of tooth or restorative materials can reach to a level as high as many kilograms. Thus the biological properties of dental materials cannot be separated from their physical and chemical properties.

f) THEORY: 80 HOURS (20 hours in First BDS & 60 hours in second BDS)

Section A- Prosthodontics, Section B- Conservative Dentistry

Sl. No	Topic	Hours
1.	Introduction - Section A Prosthodontics & Section B Conservative Dentistry	2
2.	Structure of matter and principles of adhesion- Section A Change of state, inter atomic primary bonds, inter atomic secondary bonds, inter atomic bond distance and bonding energy, thermal energy, crystalline structure, non crystalline structures, diffusion, adhesion and bonding and adhesion to tooth structures.	2
3.	Important physical properties applicable to dental materials - Section B Physical properties are based on laws of mechanics, acoustics, optics, thermodynamics, electricity, magnetism, radiation, atomic structure or nuclear phenomena. Hue, value, chroma and translucency physical properties based on laws of optics, dealing with phenomena of light, vision and sight. Thermal conductivity & coefficient of thermal expansion are physical properties based on laws of thermodynamics. Stress, strain, proportional limit, elastic limit yield strength, modulus of elasticity, flexibility, resilience, impact, impact strength, permanent deformation, strength, flexure strength fatigue, static fatigue, toughness, brittleness, ductility & malleability, hardness, abrasion	6

	resistance, relaxation, rheology, Thixotropic, creep, static creep, dynamic creep, flow, colour, three dimensional colour - hue, values, chroma, Munsell system, metamersim, fluorescence, physical properties of tooth, stress during mastication.	
4.	<p>Biological considerations in use of dental materials- Section B</p> <p>Materials used are with the knowledge of appreciation of certain biological considerations for use in oral cavity. Requirement of materials with biological compatibility. Classification of materials from perspective of biological compatibility, eg. Contact with soft tissues, affecting vitality of pulp, used for root canal fillings, affecting hard tissues of teeth, laboratory materials that could be accidentally be inhaled or ingested during handling. Hazards associated with materials: pH-affecting pulp, polymers causing chemical irritation, mercury toxicity, etc. Microleakage, Thermal changes, Galvanism, toxic effect of materials. Biological evaluation for systemic toxicity, skin irritation, mutagenicity and carcinogenicity. Disinfection of dental materials for infection control.</p>	2
5.	<p>Gypsum & gypsum products- Section A</p> <p>Gypsum - its origin, chemical formula, Products manufactured from gypsum. Dental plaster, Dental stone, Die stone, high strength, high expansion stone. Application and manufacturing procedure of each, macroscopic and microscopic structure of each. Supplied as and Commercial names. Chemistry of setting, setting reaction, theories of setting, gauging water, Microscopic structure of set material. Setting time: working time and setting time, Measurement of setting time and factors controlling setting time. Setting expansion, Hygroscopic setting expansion - factors affecting each. Strength: wet strength, dry strength, factors affecting strength, tensile strength Slurry - need and use. Care of cast. ADA classification of gypsum products Description of impression plaster and dental investment Manipulation including recent methods or advanced methods. Disinfection: infection control, liquids, sprays, radiation Method of use of disinfectants Storage of material - shelf life.</p>	4
6.	<p>Impression materials used in dentistry- Section A</p> <p>Impression plaster, Impression compound, Zinc oxide Euginol impression paste & bite registration paste incl., non Euginol paste, Hydrocolloids, reversible and irreversible, Elastomeric impression materials. Polysulphide, Condensation silicones, Addition silicones, Polyether, Visible light cure polyether urethane dimethacrylate. Historical background & development of each impression material, Definition of impression, Purpose of making impression, Ideal properties required and application of material.</p>	10

	<p>Classification as per ADA specification, general & individual impression material. Application and their uses in different disciplines. Marketed as and their commercial names, Mode of supply & mode of application bulk/wash impression. Composition, chemistry of setting, Control of setting time, Type of impression trays required, Adhesion to tray, manipulation, instruments & equipments required. Techniques of impression, storage of impression, (Compatibility with cast and die material). Any recent advancement in material and mixing devices. Study of properties: Working time, setting time, flow, accuracy, strength, flexibility, tear strength, dimensional stability, and compatibility with cast & die materials incl., electroplating Biological properties: tissue reaction, Shelf life & storage of material. Infection control - disinfection Advantages & disadvantages of each material.</p>	
	<p>Synthetic resins used in dentistry - Section A</p> <p>Historical background and development of material, Denture base materials and their classification and requirement. Classification of resins, Dental resins - requirements of dental resins, applications, polymerisation, polymerisation mechanism stages in addition polymerisation, inhibition of polymerisation, co-polymerization, molecular weight, crosslinking, plasticizers, Physical properties of polymers, polymer structures types of resins.</p>	3
7.	<p>Acrylic resins: - Section A</p> <p>Mode of polymerisation: Heat activated, Chemically activated, Light activated Mode of supply, application, composition, polymerisation reaction of each. Technical considerations: Methods of manipulation for each type of resin. Physical properties of denture base resin. Miscellaneous resins & techniques: Repair resins, Relining and rebasing. Short term and long-term soft-liners, temporary crown and bridge resins, Resin impression trays, Tray materials, Resin teeth, materials in maxillofacial prosthesis, Denture cleansers, Infection control in detail, Biological properties and allergic reactions.</p>	3
	<p>Restorative resins: - Section B</p> <p>Historical background, Resin based restorative materials, unfilled & filled, Composite restorative materials, Mode of supply, Composition, Polymerisation mechanisms: Chemically activated, Light activated, Dual cure: Degree of conversion, Polymerisation shrinkage. Classification of Composites: Application, composition and properties of each, Composites of posterior teeth, Prosthodontics resins for veneering. Biocompatibility - microleakage, pulpal reaction, pulpal protection Manipulation of</p>	4

	<p>composites: Techniques of insertion of Chemically activated, light activated, dual cure Polymerisation, Finishing and polishing of restoration, Repair of composites. Direct bonding, Need for bonding, Acid - etch technique, Enamel bonding, Dentin bonding agents. Mode of bonding, Bond strength, Sandwich technique its indication and procedure Extended application for composites: Resins for restoring eroded teeth, Pit and fissure sealing, Resin inlays system - Indirect & direct, Core build up, Orthodontic applications.</p>	
8.	<p>Metals and alloys - Section B</p> <p>Structure and behaviour of metals, Solidification of metals, mechanism of crystallisation amorphous & crystalline. Classification of alloys, Solid solutions, and Constitutes or equilibrium phase diagrams: Electric alloys, Physical properties, Peritectic alloys, Solid state reaction other binary systems: Metallography & Heat treatment Tarnish and corrosion Definition, causes of corrosion, protection against corrosion, Corrosion of dental restorations, clinical significance of galvanic current.</p> <p>Dental amalgam- Section B</p> <p>History, Definition of dental amalgam, application, Alloy classification, manufacture of alloy powder composition - available as. Amalgamation: setting reaction & resulting structure, properties, Micro leakage Dimensional stability, Strength, Creep, Clinical performance Manipulation: Selection of alloy, proportioning, mechanism of trituration, condensation, carving & finishing. Effect of dimensional changes, Marginal deterioration. Repair of amalgam, mercury toxicity, mercury hygiene.</p> <p>Direct filling gold- Section B</p> <p>Properties of pure gold, mode of adhesion of gold for restoration forms of direct filling gold for using as restorative material. Classification: Gold Foil, Electrolytic precipitate, powdered gold Manipulation: Removal of surface impurities and compaction of direct filling gold. Physical properties of compacted</p>	10
9.	<p>Dental casting alloys - Section B</p> <p>Historical background, desirable properties of casting alloys. Alternatives to cast metal technology: direct filling gold, amalgam, mercury free condensable intermetallic compound - an alternative to metal casting process. CAD-CAM process for metal & ceramic inlays - without need of impression of teeth or casting procedure, pure titanium, most bio compatible metal which are difficult to cast can be made into crowns with the aid of CAD- CAM technology . Another method of making copings - by copy milling (without casting procedures). Classification of casting alloys: By function &</p>	6

	<p>description. Recent classification, High noble (HN), Noble (N) and predominantly base metal (PB) Alloys for crown & bridge, metal ceramic & removable partial denture. Composition, function, constituents and application, each alloy both noble and base metal, Properties of alloys: Melting range, mechanical properties, hardness, elongation, modulus of elasticity, tarnish and corrosion. Casting shrinkage and compensation of casting shrinkage. Biocompatibility - Handling hazards & precautions of base metal alloys, casting investments used. Heat treatment: Softening & hardening heat treatment. Recycling of metals. Titanium alloys & their application, properties & advantages. Technical considerations in casting. Heat source, furnaces, gold, Clinical performance.</p>	
10	<p>Dental waxes including inlay casting wax - Section B</p> <p>Introduction and importance of waxes: Sources of natural waxes and their chemical nature. Classification of Waxes: Properties: melting range, thermal expansion, mechanical properties, flow & residual stresses, ductility. Dental Wax: Inlay wax: Mode of supply: Classification & composition, Ideal requirements: Properties of inlay wax: Flow, thermal properties Wax distortion & its causes. Manipulation of inlay wax: Instruments & equipment required, including electrically heated instruments metal tips and thermostatically controlled wax baths. Other waxes: Applications, mode of supply & properties. Casting Wax, Base plate wax, Processing wax, Boxing wax, Utility wax, Sticky wax, Impression wax for corrective impressions Bite registration wax.</p>	2
11	<p>Dental casting investments - Section A</p> <p>Definition, requirements, classification Gypsum bonded - classification. Phosphate bonded, Silica bonded Mode of Supply: Composition, application, setting mechanism, setting time & factors controlling. Expansions: Setting expansion, Hygroscopic Setting expansion, & thermal expansion: factors affecting. Properties: Strength, porosity, and fineness & storage. Technical considerations: For Casting procedure Preparation of die, Wax pattern, spruing, investing, control of shrinkage compensation, wax burnout, and heating the invested ring, casting. Casting machines, source of heat for melting the alloy. Defects in casting.</p>	2
12	<p>Soldering, brazing and welding - Section B (Classes to be handled by orthodontics department)</p> <p>Need of joining dental appliances, Terms & Definition, Solders: Definition, ideal requirement, types of solders - Soft & hard and their fusion temperature, application. Mode of supply of solders, Composition and selection, Properties. Tarnish & corrosion</p>	2

	<p>resistance mechanical properties, microstructure of soldered joint. Fluxes & Anti fluxes: Definition, Function, Types, commonly used fluxes & their selection Technique of Soldering & Brazing: free hand soldering and investment, steps and procedure. Welding,: Definition, application, requirements, procedure, weld decay - causes and how to avoid it. Laser welding.</p>	
13	<p>Wrought base metal alloys - Section A (Classes to be handled by orthodontics department)</p> <p>Applications and different alloys used mainly for orthodontics purpose</p> <p>Stainless steel</p> <p>Cobalt chromium nickel</p> <p>Nickel titanium</p> <p>Beta titanium</p> <p>Properties required for orthodontic wires, working range, springiness, stiffness, resilience, Formability, ductility, ease of joining, corrosion resistance, stability in oral environment, bio compatibility</p> <p>Stainless steels: Description, type, composition & properties of each type. Sensitisation & stabilisation, Mechanical properties - strength, tensile, yield strength, KHN. Braided & twisted wires their need, Solders for stainless steel, Fluxes, Welding. Wrought cobalt chromium nickel alloys, composition, allocation, properties, heat treatment, physical properties. Nickel - Titanium alloys, shape, memory & super elastic Titanium alloys, application, composition, properties, welding, Corrosion resistance</p>	3
14	<p>Dental cements- Section B</p> <p>Definition & Ideal requirements of Dental Cements: Silicate, Glass ionomer, metal modified glass ionomer, resin modified glass ionomer, zinc oxide Eugenol, modified zinc oxide Eugenol, zinc phosphate, zinc silico phosphate, zinc poly carboxylate Cavity liners and cement bases Varnishes Calcium hydroxide. Gutta percha</p> <p>Application, classification (general and individual), setting mechanism, mode of supply, Properties, factors affecting setting, special emphasis on critical procedures of manipulation and protection of cement, mode of adhesion, biomechanism of caries inhibition. Agents for pulpal protection, Modifications and recent advances, Principles of cementation. Special emphasis on cavity liners and cement bases and luting agents.</p>	5
15	<p>Dental ceramics - Section A</p> <p>Historical background & General applications of Dental ceramics: definition, classification, application, mode of supply, manufacturing procedure, methods of</p>	8

	<p>strengthening. Properties of fused ceramic: Strength and factors affecting, modulus of elasticity, surface hardness, wear resistance, thermal properties, specific gravity, chemical stability, esthetic properties, biocompatibility, technical considerations.</p> <p>Metal Ceramics (PFM): Alloys - Types and composition of alloys Ceramic - Type and Composition. Metal Ceramic Bond, Nature of bond. Bonding using electro deposition, foil copings, bonded platinum foil, swaged gold alloy foil coping. Technical considerations for porcelain and porcelain fused metal restorations. Recent advances - all porcelain restorations, Manganese core, injection moulded, castable ceramics, glass infiltrated alumina core ceramic (In ceram), ceramic veneers, inlays and onlays, and CAD - CAM ceramic. Chemical attack of ceramic by fluoride. Porcelain furnaces.</p>	
16	<p>Abrasion & polishing agents - Section A</p> <p>Definition of abrasion and polishing. Need of abrasion and polishing. Types of abrasives: Finishing, polishing & cleaning. Types of abrasives: Diamond, Emery, aluminum oxides garnet, pumice, Kieselgurh, tripoli, rouge, tin oxide, chalk, chromic oxide, sand, carbides, diamond, zirconium silicate Zinc oxide. Abrasive action. Desirable characteristics of an abrasive, Rate of abrasion, Size of particle, pressure and speed. Grading of abrasive & polishing agents. Binder, Polishing materials & procedures used. Technical consideration, Material and procedure used for abrasion and polishing Electrolytic polishing and burnishing.</p>	1
17	<p>Die and counter die materials including electroforming and electro polishing - Section A</p> <p>Types - Gypsum products, Electroforming, Epoxy resin, Amalgam</p>	1
18	<p>Dental implants - Section A</p> <p>Evolution of dental implants, types and materials.</p>	2
19	<p>Mechanics of cutting - Section B</p> <p>Burs and points.</p>	1
20	<p>Waste disposal - Section B</p> <p>At the end of the course the student should have the knowledge about the composition, properties, manipulative techniques and their various commercial names.</p> <p>The student should also acquire skills to select and use the materials appropriately for laboratory and clinical use.</p> <p>(1) Qualitative observation of restorative dental resins.</p> <p>(2) Determination of setting time of chemically activated composite resins.</p>	1

g) PRACTICALS: 240 Hours (40 hours in First BDS & 200 Hours in second BDS)

Demonstration of manipulation of all materials (for a batch not more than 8 students).

Exercises to be done by each student:

Impression material

Manipulation, making impressions, identifying setting time and defects. (Comparative studies included)

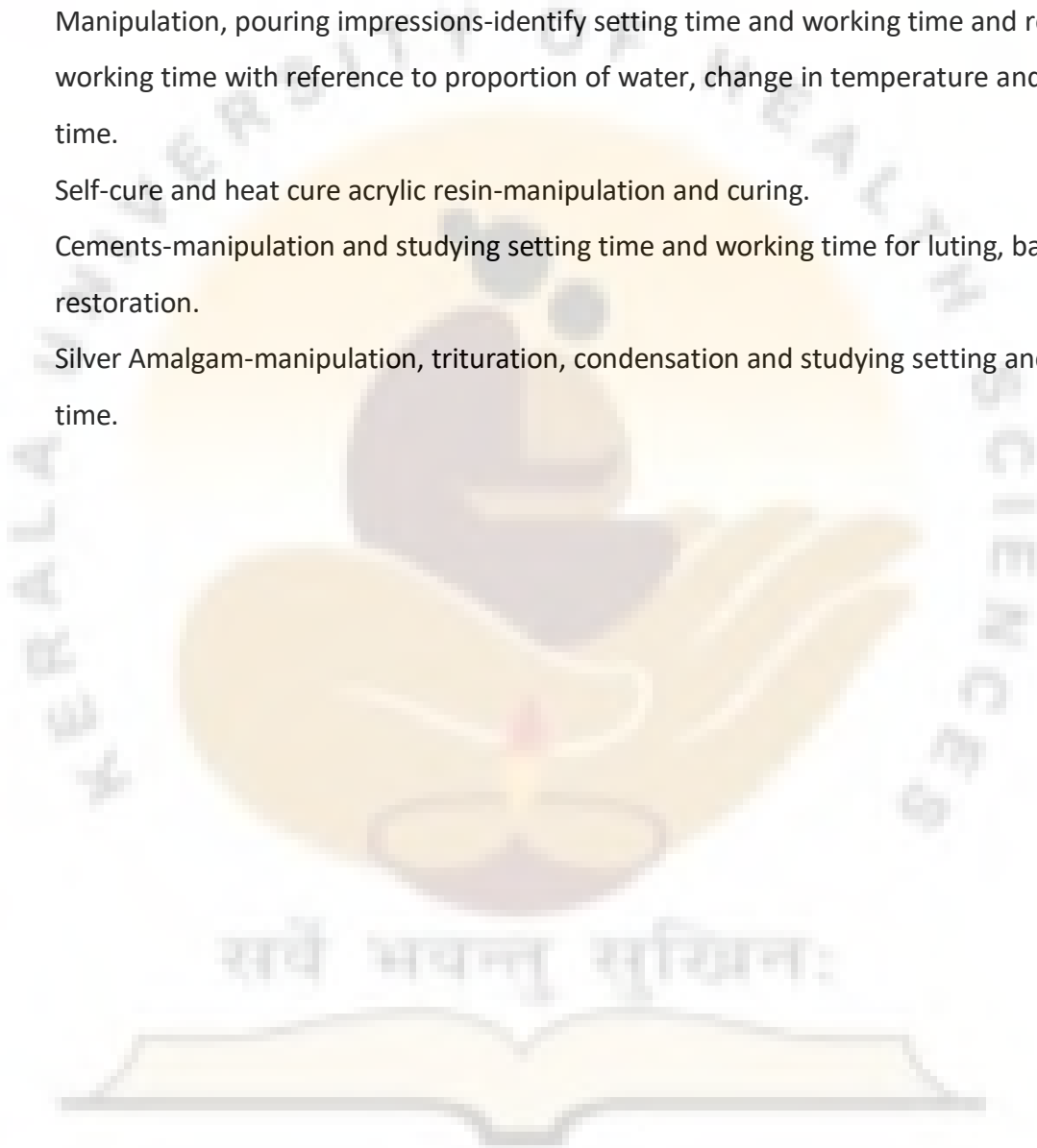
Gypsum products

Manipulation, pouring impressions-identify setting time and working time and relation of working time with reference to proportion of water, change in temperature and spatulation time.

Self-cure and heat cure acrylic resin-manipulation and curing.

Cements-manipulation and studying setting time and working time for luting, base and restoration.

Silver Amalgam-manipulation, trituration, condensation and studying setting and working time.



h) SCHEME OF EXAMINATION:

The University Theory examination will have two sections of 35 marks each Section A Prosthodontics & Section B Conservative Dentistry (overlapping of topics may occur) For Dental Materials University Practical Examination, if internal examiner is from Prosthodontics, External examiner should be from Conservative Dentistry and vice versa

Distribution of Topics and Type of Questions for written examination

Section A: Prosthodontics

Contents	Types of Questions and Marks	Marks
Question from any Prosthodontic topic preferably included in Section A	Structured Essay 1x 10marks	10
Questions from any Section A topic including orthodontics. Avoid questions in the topic from which long essay question is set	Short Notes 2 x 5marks	10
	Brief Notes 5x3marks	15
	Total	35

i. Theory:

University written Examination:	35Marks
University Viva:	10Marks
Internal Assessment:	5 Marks
	Total: 50 Marks

ii. Practicals:

Internal Assessment:	10 Marks
University Practicals:	40Marks
	Total: 50 Marks
	Grand Total 100Marks

Spotters (5x 2Marks) 10 Marks

Manipulation of Any one of the following Dental materials: 25 Marks

Gypsum products

Irreversible Hydrocolloid

Impression Compound

Rubber base impression Material

Zinc Oxide Impression Material

Heat cured PMMA

Practical Work Record 5 Marks

Distribution of Topics and Type of Questions for University Written examination:

Section B: Conservative Dentistry

Contents	Types of Questions and Marks	Marks
Question from Any Conservative Dentistry topic preferably included in Section B	Structured Essay 1x 10marks	10
Questions from any Section B topic including orthodontics. Avoid questions in the topic from which long essay question is set	Short Notes 2 x 5marks	10
	Brief Notes 5x3marks	15
	Total	35

i. **Theory:**

University written Examination:	35Marks
University Viva:	10Marks
Internal Assessment:	5 Marks
	Total: 50 Marks

ii. **Practicals:**

Internal Assessment:	10 Marks
University Practicals:	40Marks
	Total: 50 Marks

Grand Total 100Marks

Spotters (5x 2Marks)	10 Marks
Manipulation of Any one of the following Dental Cements:	25 Marks
ZnO Euginol (Luting/Filing Consistency)	
Zinc Phosphate Cement (Luting/base Consistency)	
Glass Ionomer Cement Type I/II (Luting/Filling Consistency)	
Polycarboxylate Cement (Luting Consistency)	
Amalgam Trituration	
Practical Work Record	5 Marks

8. GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICS

a) **GOAL:**

The broad goal of teaching under graduate students in pharmacology is to inculcate rational and scientific basis of therapeutics keeping in view of dental curriculum and Profession.

b) **OBJECTIVES:**

At the end of the course the student shall be able to:

- i. Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs in general and in dentistry in particular,
- ii. List the indications, contraindications; interactions, and adverse reactions of commonly used drugs with reason,
- iii. Tailor the use of appropriate drugs in disease with consideration to its cost, efficacy, safety for individual and mass therapy needs,
- iv. Indicate special care in prescribing common and essential drugs in special medical situations such as pregnancy, lactation, old age, renal, hepatic damage and immuno compromised patients,
- v. Integrate the rational drug therapy in clinical pharmacology,
- vi. Indicate the principles underlying the concepts of "Essential drugs".
- vii. Recognise and report adverse drug reaction to suitable authorities.

c) **SKILLS:**

At the end of the course the student shall be able to:

- i. Prescribe drugs for common dental and medical ailments.
- ii. To appreciate adverse reactions and drug interactions of commonly used drugs.
- iii. Observe experiments designed for study of effects of drugs.
- iv. Critically evaluate drug formulations and be able to interpret the clinical pharmacology of marketed preparations commonly used in dentistry.

d) **INTEGRATION:**

Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical departments.

e) **THEORY: 70 HOURS**

1. General Pharmacology :	
a. Definitions: Pharmacology, drug, Pharmacy, sources of drugs with examples.	1
b. Pharmacokinetics with clinical implications.	2
c. Routes of administration: oral, inhalation, intradermal, Subcutaneous, intramuscular, intravenous, intrathecal, perineural & Newer drug regimes. (Advantages and disadvantages with the examples of drugs administered).	1
d. Pharmacodynamics: mechanism of action ,factors modifying drug actions	2

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with emphasis on factors like-age, sex, dose ,frequency & route of administration, presence of other drugs, Pharmacogenetics and Pathological conditions.	
e. Therapeutics: Principles of drug therapy, Adverse drug reactions and drug interactions.	3
2.ANS drugs:	
Clinically used examples, their important pharmacological actions (which form the basis for the uses),clinical uses along with dental uses if any and specific adverse effects of-	
a. Sympathomimetics	1
b. Sympatholytics- α -blockers, Beta-blockers.	2
c. Cholinomimetics.	2
d. Anticholinergics & Skeletal muscle relaxants	2
3. Detailed pharmacology of:	
a.Clinically used opioid and non-opioid analgesics.	2
b. Clinically used local anesthetics.	2
Detailed Pharmacology & Enumeration of clinically used agents, their brief Pharmacology, clinical uses along with dental uses if any, and specific adverse effects of:	
a. Ethylalcohol- actions, uses and drug interactions.	1
b. General anesthetics & Pre-anaesthetic medication	2
c. Antipsychotics, antidepressants, anxiolytics	2
d. Sedativehypnotics	2
e. Antiepileptics	1
CVS drugs:	
Enumeration/Classification of clinically used agents their important pharmacological actions(that form the basis of their uses)Clinical uses along with dental uses if any, and specific adverse effects of	
a. Cardiac glycosides	1
b. Antiangina drugs	1
c. Antihypertensives.	1
d. Diuretics	1
e. Pharmacotherapy of shocks-anaphylactic, cardiogenic hypovolemic & Septic.	1
Drugs acting on blood: Detailed pharmacology of:	
a. Coagulants, anticoagulants, fibrinolytics, antiplatelet drugs and styptics	3
b. Hematinics: Iron preparation Vit.B12, Folic acid Vit.C	3
c. Vit.D and calcium preparations	1
Endocrines:	
Enumeration/Classification of clinically used agents and their preparations, Mechanism of action, clinical uses along with dental uses if any and specific adverse effects of:	
a. Drugs used in diabetes mellitus	2
b. Corticosteroids	2
Chemotherapy:	
Enumeration/Classification of clinically used Agents, their mechanism of	

action clinical uses along with dental uses if any and specific adverse effects of:	
a. Sulfonamides	1
b. Beta-lactum antibiotics	2
c. Macrolides and aminoglycosides	1
d. Broad spectrum antibiotics	1
e. Antifungal and antiviral (acyclovir) agents	2
f. Metronidazole and fluoroquinolones	1
g. Antineoplastic Drugs: Alkylating agents, Antimetabolites, Radioactive Isotopes, Vinka Alkaloids, Anticancer antibiotics.	2
h. Drug Therapy of Tuberculosis, Leprosy & Malaria	3
Other drugs: Enumeration o clinically used agents, general uses along with dental uses if any and specific adverse effects of:	
a. Antihistamines and anti emetics	2
b. Drugs used in bronchial asthma and cough	1
c. Drugs used in peptic ulcer	2
d. Chelating agents-BAL, EDTA & Penicillamine	1
e. Antihelminthics	2
Dental Pharmacology	
a. Fluoride pharmacology	1
b. Antiseptics, astringents & Sialogogues	1
c. Obtundents, Mummifying agents and disclosing agents	1
d. Prevention and drug therapy of emergencies in dental practice	
1. Seizures	2
2. Anaphylaxis	
3. Severe bleeding	
4. Shock	
5. Tetany	
6. Status asthmaticus	
7. Acute addisonian crisis	
8. Diabetic Ketoacidosis	

f) PRACTICALS AND DEMONSTRATIONS: 20 HOURS

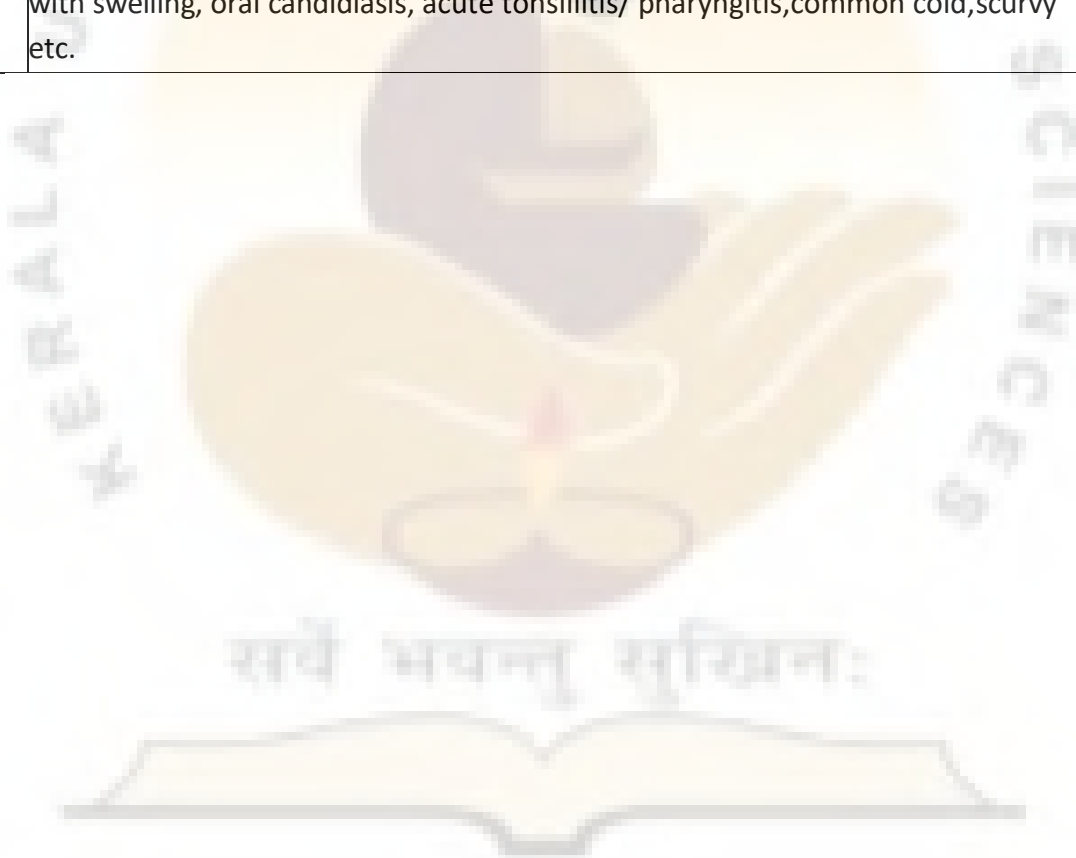
To familiarise the student with the methodology: prescription writing and dispensing.

Rationale of drug combinations of marketed drugs.

Sl. No.	Procedure	Hours
1	Introduction-equipments used in dispensing pharmacy, prescription-parts and model prescription.	2
2	Demonstration of common dosage forms used in clinical practice	
3	Mixtures-one example(Expectorant/Salicylate)of simple and diffusible (Bismuth Kaolin/chalk)mixtures	2

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4	Emulsion-Types and example(Liniment turpentine/Shark liver oil) of emulsion	2
5	Powders-toothpowder	2
6	Mandl's paint/Gum paint percentage dilution-concept and calculations with suitable examples.	2
7	Mouthwashes-Alkaline, antiseptic, astringent	2
8	Toothpastes	2
9	Prescription writing for 15 general conditions commonly encountered in clinical practice. eg. Bronchial asthma, hypertension congestive heart failure, angina pectoris, peptic ulcer, bacillary dysentery, diabetes mellitus, diabetic coma, osteoarthritis, anaphylaxis, status asthmaticus, Status epilepticus, iron deficiency & pernicious anaemia	2
10	Dental prescriptions for about fifteen dental conditions commonly encountered in practice eg. Acute necrotising ulcerative gingivitis, acute herpetic gingivitis/stomatitis, acute gingival abscess, pericoronal abscess (impacted teeth), dental caries, aphthous ulcers, hypersensitive dentine, dentoalveolar abscess, xerostomia, acute toothache, post-operative pain, post extraction pain with swelling, oral candidiasis, acute tonsillitis/ pharyngitis, common cold, scurvy etc.	2



g) SCHEME OF EXAMINATION

Distribution of Topics and Type of Questions for University Written examination:

Contents	Types of Questions and Marks	Marks
Questions from Pharmacokinetics, pharmacodynamics, antibiotics, NSAID's, Local Anaesthetics, Anticoagulants, Beta blockers, Glucocorticoids, Calcium Channel blockers, ACE inhibitors, Opioid analgesics, Sympathomimetics, Anti-Cholinergics, Cardiac Glycosides, Dental Pharmacology.	Structured Essays 2x 10marks	20
Questions should Preferably be set from all other chapters excluding the one from which a Long Essay Question has been set	Short notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	70

i. Theory

University Written	70Marks
Internal Assessment	20 Marks
Viva Voce	10 Marks

ii. Practicals:

University Practical Examination:	80 Marks
Spotters 10x 1Mark	10 Marks
Prescriptions (1 Medical & 1 Dental) 2x10Marks	20 Marks
Preparations (1 Medical & 1 Dental) 2x20Marks	40 Marks
Practical Work Record	10 Marks
Internal Assessment	20 Marks

Grand Total 200Marks

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9. PRE CLINICAL CONSERVATIVE DENTISTRY

a) LABORATORY EXERCISES

Sl.No.	Practical exercise	Hours
1	Identification and study of hand cutting instruments chisels, gingival margin trimmers, excavators and hatchet.	3
2	Identification and use of rotary cutting instruments in contra angle hand pieces burs (Micromotor)	2
3	Preparation of class I and extended class I and class II and MOD's and class V amounting to 10 exercises in plaster models	30
4	Exercises on phantom head models(Typhodonts) which includes tooth preparation, base and varnish application, matrix and wedge placement followed by amalgam restoration	95
	Class I 5	
	Class I with extension 2	
	Class II 10	
	Class II MODS 2	
	Class V and III for glass ionomer 4	
Class V for amalgam 2		
5	10 exercises on mounted extracted teeth .Tooth preparation, base application, matrix and wedge placement, and restoration with amalgam.	20
	Class I 2	
	Class I with extension 2	
	Class II 4	
	Class V 2	
	Polishing of above restorations	
6	Management of deep caries a. Pulp capping : Direct/ Indirect on extracted teeth	3
7	Demonstration of Light cure composite and Glass Ionomer Restorations.	
8	Cast Restoration –Inlay preparation:	20
	Class I 1 To prepare Wax patterns	
	Class II 2+1 MOD To prepare wax patterns	
	Class V 1 (posterior)	

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9	Pulpotomy on extracted posterior teeth	27
10	Endodontic exercises. Root canal access preparation on Upper Extracted Central incisor. Determination of working length Demonstration of Instrumentation and Obturation of root canal space. Restoration of access preparation	

To appear for IIBDS preclinical Conservative Dentistry examination it is Mandatory that Laboratory exercises from No. 1 to No. 7 mentioned in the table above is completed.



b) SCHEME OF EXAMINATION

i. Practicals

University practical examination	60
University Viva Voce	20
Internal Assessment	20

Grand Total **100**

Distribution of Marks for Preclinical Conservative Dentistry University Practical Examination

<i>(1) Tooth Preparation and Restoration</i>	<i>45 Marks</i>
<i>(2) Spotters (5 x 2 Marks)</i>	<i>10 Marks</i>
<i>(3) Preclinical Practical Work Record</i>	<i>05 Marks</i>
<i>Total: 60 Marks</i>	

Practical Exercise No. (1): 45 Marks

Class II Conventional / Conservative preparation for Silver Amalgam restoration on Maxillary or Mandibular first or second Molar typhodont tooth.

<i>Cavity preparation</i>	<i>45 Minutes</i>	<i>20 Marks</i>
<i>Base and Matrix</i>	<i>15 Minutes</i>	<i>10 Marks</i>
<i>Amalgam restoration and carving</i>	<i>30 Minutes</i>	<i>15 Marks</i>

Practical Exercise No. (2):

Spotters: Time: (2 minutes each x 5) 10 Minutes 10Marks

Type of Spotters:

Hand instruments used for tooth preparation and restoration

Identification of Root Canal Instruments

10. PRE CLINICAL ORTHODONTICS

a) SCHEME OF STUDY

The undergraduate study of orthodontics spans over second year, third year and fourth year. In second year the emphasis is given for basic and preclinical wire bending exercises and appliance fabrication.

b) AN OUTLINE OF THE COURSE CONTENT:

Preclinical basic wire bending exercises enable the candidate to get accustomed with the orthodontic wire, learn the basic skills of wire bending, learn how to construct various components of removable appliances and to acrylicise various removable appliances.

c) PRATICAL TRAINING DURING SECOND YEAR B.DS

Sl .No.	Topic	Hours
1	Basic wire bending exercises <ul style="list-style-type: none">• Straightening of wire• Equilateral triangle• Square• Rectangle• Circle• U – V	40
2	Pre clinical wire bending exercises (Mandatory) <ul style="list-style-type: none">• C – clasp• Full clasp• Triangular clasp• Adams clasp• Finger spring• Double cantilever spring• Coffin spring• Short labial bow• Long labial bow• Split labial bow	60

	<ul style="list-style-type: none"> • U loop buccal canine retractor • Helical canine retractor • Self supported canine retractor <p>Pre clinical wire bending exercises (Desirable)</p> <ul style="list-style-type: none"> • Palatal canine retractor • T spring • Reverse labial bow • Roberts retractor 	
3	<p>Appliance fabrication</p> <ul style="list-style-type: none"> • Hawley's appliance • any one of the habit breaking appliance - <ul style="list-style-type: none"> a. Tongue guard appliance b. Oral screen • Desirable appliances <ul style="list-style-type: none"> a) Hawley' s appliance with Anterior bite plane b) Hawley 's appliance with PBP and Z spring c) Catalans appliance d) Expansion appliance 	60

Theory topics listed below to be covered in second BDS. Lecture hours should be adjusted with the practical classes.

- a) Introduction to orthodontics
- b) Removable appliances - parts, uses, modifications, advantages, disadvantages etc.
- c) Wrought wire alloys
- d) Soldering and welding

d) SCHEME OF EXAMINATION

i. Practicals

University practical examination	60
University Viva Voce	20
Internal Assessment	20
	<hr/>
Grand Total	100

Distribution of Marks for Preclinical Orthodontics University Practical Examination

(1) Wire bending exercises	55 Marks
(2) Preclinical Practical Work Record	05 Marks

Wire bending exercises and their mark distribution should be as follows:

- a) Labial bow 20 Marks
- b) Clasp 20 Marks
- c) Spring 15Marks

Note: Preclinical viva should be limited to, Orthodontic material science (orthodontic wire alloys, impression materials, acrylic, Gypsum products), removable appliances, study models, soldering and welding

11. PRECLINICAL PROSTHODONTICS AND CROWN & BRIDGE

a) **LABORATORY EXERCISES: Total 380 Hours (I yr. 100, II yr. 200, IIIyr.80)**

Sl.No.	Practical Exercise	Hours
<i>Laboratory steps related to complete denture</i>		
1	Impression and model preparation	150
2	Preparation of special trays in shellac base plates – trimmed margin. Maxillary & Mandibular	
3	Special tray in self cured acrylic resin. Maxillary & Mandibular	
4	Preparation of heat cured acrylic permanent bases. Maxillary & Mandibular	
5	Preparation of Self cured acrylic temporary bases Maxillary & Mandibular	
6	Preparation of occlusion rims	
7	Articulating the model in Mean value articulator	
8	Teeth arrangement in Mean value articulator (Class I) - 5 Numbers	
9	Processing trial denture in heat cured acrylic- 1	
10	Repair of fractured Denture	
<i>Laboratory steps related to partial denture</i>		
11	Fabrication of heat cured acrylic Partial Dentures – (Kennedy class I, class II, class III & class IV)	100
12	Surveying a model (demo only)	
13	Preparation of wax pattern on models for cast RPD (Kennedy class I & class II,)	
14	Preparation of wax pattern on models for cast RPD (Kennedy class III & class IV,)demo only	
<i>Maxillofacial Prosthesis</i>		
14	Preparation of Obturators	50
<i>Fixed Prosthodontics</i>		
16	Preparation of full crowns on large sized teeth – anterior all ceramic & posterior PFM.	80
17	Preparation of full crowns on Typhodont anterior teeth on phantom head.	

A work record should be maintained by all students and should be submitted at the time of examination after due certification from the Head of the Department.

To appear for IIBDS preclinical Prosthodontics examination it is Mandatory that Laboratory exercises from Nos. 1 to 11 mentioned in the table above are completed.

b) SCHEME OF EXAMINATION

i. Practicals

University practical examination	60
University Viva Voce	20
Internal Assessment	20
	—
Grand Total	100

Distribution of Marks for Preclinical Prosthodontics University Practical Examination

- (1) Arrangement of teeth in class I relation, Waxing, Carving & Polishing: 35 Marks
- (2) Drawing the Design for a Cast Partial Denture and marking its components 15 Marks
- (3) Preclinical Practical Work Record 10 Marks

Note: Preclinical viva should be limited to, Laboratory Procedures related to Complete Denture Fabrication, Articulators, Anatomical landmarks, Impression Procedures, Introduction to jaw relation recording, Selection & arrangement of teeth, Complete Denture Occlusion, Try in Procedures and Components of RPD & FPD.

12. GENERAL MEDICINE

a) GUIDELINES:

Special emphasis should be given throughout on the importance of various diseases as applicable to dentistry.

- i. Special precautions/ contraindication for anaesthesia in oral and dental procedures in different systemic diseases.
- ii. Oral manifestations of systemic diseases.
- iii. Medical emergencies in dental practice.

A dental student should be taught in such a manner that he/she is able to record the arterial pulse, blood pressure and be capable of suspecting by sight and superficial examination of the body, diseases of the heart, lungs, kidneys, blood etc. He should be capable of handling medical emergencies encountered in dental practice.

b) THEORY: 60 HOURS

CORE TOPICS	Hours
1. Aims of medicine, definitions of diagnosis, treatment & prognosis. History taking, Physical examination of the patient, diagnosis and management of disease. Genetics and disease, Medical Ethics.	2
2. Infections: Enteric fever, HIV, Herpes simplex, Herpes zoster, Syphilis, Diphtheria, Malaria, Actinomyces, Viral hepatitis, Tuberculosis. Infectious mononucleosis Mumps, Measles, Rubella, Leprosy, Organisation and functions of the immune systems.	5
3. G.I.T: Stomatitis, Gingival hyperplasia, Dysphagia, Acid peptic disease, Jaundice, Acute and chronic hepatitis, Cirrhosis of liver, Ascitis, Amoebiasis, Tender hepatomegaly, Hepatotoxic drugs, Portal hyper tension. Diarrhoea and Dysentery including Malabsorption syndromes, Helicobacter pylori.	5
4. CVS :Acute rheumatic fever Valvular heart disease, Hypertension, Ischemic heart disease (myocardial infarction), Infective endocarditis, Common arrhythmias, Classification of congenital heart disease, Congestive cardiac failure. Heart failure, Fallot's tetralogy, ASD, VSD.	7
5. Respiratory System: Applied Anatomy and physiology of RS, Pneumonia, COPD, Pulmonary tuberculosis, Bronchial asthma, Pleural effusion, Acute respiratory tract infections, Pulmonary embolism, Suppurative lung diseases, and Lung abscess. Pneumothorax, Bronchiectasis Lung Cancer, Empyema, Sleep apnea, ARDS, Respiratory failure.	6
6. Hematology: Hematopoiesis, Anaemias, Bleeding & Clotting disorders, Acute and chronic myeloid leukemias, Agranulocytosis and Neutropenia, Thrombocytopenia, Splenomegaly Lymphomas, Oral manifestations of haematological disorders, Generalized Lymphadenopathy. Principles of blood and blood products transfusion, Thromboembolic disease, Oncogenesis, Haemolytic anemia, DIC (Disseminated Intravascular	7

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Coagulation).	
7. Renal System :Acute nephritis and Nephrotic syndrome, U.T.I Renal function tests ,CRF	5
8. Nutrition: Balanced diet, PEM, Vitamin deficiency disease, Calcium and phosphate metabolism, Flurosis, Osteomalacia, Osteoporosis.	4
9. CNS: Facial palsy, Facial pain Trigeminal neuralgia, Epilepsy, Headache including migraine. Meningitis (Acute and Chronic) Anticonvulsants, Examination of comatose patient, Examination of cranial nerves.	7
10. Endocrine: Diabetes mellitus Acromegaly, Hypothyroidism, Thyrotoxicosis, Calcium metabolism and parathyroids. Addison's disease, Cushing's syndrome, Parathyroid disease and calcium metabolism, Preoperative assessment of diabetic patients, Acute adrenal deficiency.	6
11. Critical care: Syncope, Cardiac arrest, Cardio Pulmonary Resuscitation (CPR), Cardiogenic shock, Anaphylaxis, Allergy, Angio -neurotic edema. Acute LVF, ARDS, Coma.	4
Miscellaneous: Adverse drug reactions, Drug interactions. Rheumatoid disease, Osteoarthritis, Scleroderma.	

c) CLINICAL TRAINING: 90 HOURS (posting in a general hospital)

The student must be able to take history, do general physical examination (including build, nourishment, pulse, BP, temperature, edema, respiration, clubbing, cyanosis, jaundice, lymphadenopathy, and oral cavity) and be able to examine CVS, RS, abdomen and facial nerve and signs of meningeal irritation.

d) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Types of Questions and Distribution of Marks	Total Marks
Structured Essays 2x 10marks	20
Short notes 4 x 5marks	20
Brief notes 10x3marks	30
Total	70

i. Theory

University Written	70 Marks
Viva Voce	20 Marks
Internal Assessment	10 Marks

ii. Clinical:

University Clinical Examination:	80 Marks
Case History	15 Marks
Clinical Examination	30 Marks
Investigation	10Marks
Diagnosis & D.D	15 Marks
Management	10 Marks
Internal Assessment:	20 Marks

Grand Total 200Marks

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13. GENERAL SURGERY

a) AIMS:

To acquaint the student with various diseases which may require surgical intervention. And to train the student to analyze the disease history and be able to do a thorough physical examination of the patient. The diseases as related to head and neck region are to be given due importance, at the same time other relevant surgical problems are also to be addressed. At the end of one year of study the student should have a good theoretical knowledge of various ailments, and be practically trained to differentiate benign and malignant diseases and be able to decide which patient requires further evaluation.

b) OBJECTIVES:

Skills to be developed by the end of teaching are to examine a routine swelling, ulcer and other related diseases and to perform minor surgical procedures such as draining an abscess, taking a biopsy etc.

c) THEORY: 60 HOURS

Sl. No.	Topic	Hours
1	HISTORY OF SURGERY: The development of surgery as a specialty over the years, will give the students an opportunity to know the contributions made by various scientists, teachers and investigators. It will also enable the student to understand the relations of various specialties in the practice of modern surgery.	1
2	GENERAL PRINCIPLES OF SURGERY: Introduction to various aspects of surgical principles as related to orodental diseases. Classification of diseases in general. This will help the student to understand the various diseases, their relevance to routine dental practice.	2
3	PRINCIPLES OF OPERATIVE SURGERY: Principles as applicable to minor surgical procedures including detailed description of asepsis, antiseptics, sterilisation, principles of anaesthesia and principles of tissue replacement. Knowledge of sutures, drains, diathermy, cryosurgery and use of Laser in surgery.	1
4	WOUNDS: Their classification, wound healing, repair, treatment of wounds, skin grafting, medicolegal aspects of accidental wounds and complications of wounds.	3

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5	INFLAMMATION: Of soft and hard tissues. Causes of inflammation, varieties, treatment and sequelae.	1
6	INFECTIONS: Acute and chronic abscess skin infections, cellulitis, carbuncle, and erysipelas. Specific infections such as tetanus, gangrene, syphilis, gonorrhoea, tuberculosis, Actinomyces, Vincents angina, cancrum oris. Pyaemia, toxemia and septicemia.	5
7	TRANSMISSIBLE VIRAL INFECTIONS: HIV and Hepatitis B with special reference to their prevention and precautions to be taken in treating patients in a carrier state.	2
8	SHOCK AND HAEMORRHAGE: Classification, causes, clinical features and management of various types of shock. Syncope, Circulatory collapse. Haemorrhage -different types, causes, clinical features and management. Blood groups, blood transfusion, precautions and complications of blood and their products. Hemophilia's, their transmission, clinical features and management especially in relation to minor dental procedures.	5
9	TUMOURS, ULCERS, CYSTS, GANGRENE, SINUS, AND FISTULAE: Classification, clinical examination and treatment principles in various types of benign and malignant tumours, ulcers, cysts, gangrene, sinus and fistulae.	9
10	DISEASES OF LYMPHATIC SYSTEM: Especially those occurring in head and neck region. Special emphasis on identifying diseases such as tubercular infection, lymphomas, leukaemias, metastatic lymph node diseases.	1
11	DISEASES OF THE ORAL CAVITY: Infective and malignant diseases of the oral cavity and oropharynx including salivary glands with special emphasis on preventive aspects of premalignant and malignant diseases of the oral cavity.	2
12	NECK SWELLINGS – Midline and Lateral swellings, Cystic and Solid swellings –Classification, Differential diagnosis, Treatment	1
13	DISEASES OF LARYNX, NASOPHARYNX: Infections and tumours affecting these sites. Indications, procedure and complications of tracheostomy.	2
14	NERVOUS SYSTEM: Surgical problems associated with nervous system with special reference to the principles of peripheral nerve injuries, their regeneration and principles of treatment. Detailed description of affections of facial nerve And its management. Trigeminal neuralgia, its	1

	presentation and treatment.	
15	FRACTURES: General principles of fractures, clinical presentation and treatment with additional reference to newer methods of fracture treatment. Special emphasis on fracture healing and rehabilitation.	1
16	HEAD INJURY MANAGEMENT	1
17	MANAGEMENT OF SEVERELY INJURED PATIENT – RESUSCITATION	1
18	DISEASES OF ARTERIES AND VEINS IN GENERAL –Varicose veins, Atherosclerosis, Aneurysm, Carotid Body tumours	1
19	ANOMALIES OF DEVELOPMENT OF FACE: Surgical anatomy and development of face. Cleft lip and cleft palate—principles of management.	1
20	DISEASES OF THYROID AND PARATHYROID: Surgical anatomy, pathogenesis, clinical features and management of dysfunction of thyroid and parathyroid glands. Malignant diseases of the thyroid—classification, clinical features and management.	2
21	SWELLINGS OF THE JAW: Differential diagnosis and management of different types of swellings of the jaw, Osteomyelitis of mandible	2
22	BIOPSY: Different types of biopsies routinely used in surgical practice.	1
23	BURNS AND SCALDS	1

Desirable to know: Introduction to oncology, radiotherapy, surgery and genetic engineering

E.N.T: Ear: Middle ear infection; Nose: Para nasal sinuses; Throat: Tonsillitis & Peritonsillar Abscess

d) CLINICALS: 90 HOURS (posting in a general hospital)

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e) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written examination:

Types of Questions and Distribution of Marks	Total Marks
Structured Essays 2x 10marks	20
Short Notes 4 x 5marks	20
Brief Notes 10x3marks	30
Total	70

i. Theory

University Written	70 Marks
Viva Voce	20 Marks
Internal Assessment	10 Marks

ii. Clinical:

University Clinical Examination:	80 Marks
Long Case	
Case History	15 Marks
Clinical Examination	30 Marks
Suggested Investigations	10Marks
Diagnosis & D.D	15 Marks
Management	10 Marks
Internal Assessment:	20 Marks

Grand Total 200Marks

14. ORAL PATHOLOGY & ORAL MICROBIOLOGY

a) OBJECTIVES:

At the end of Oral Pathology & Microbiology course, the student should be able to:

- i. Comprehend the different types of pathological processes that involve the Orofacial tissues.
- ii. Comprehend the manifestations of common diseases, their diagnosis & correlation with clinical pathological processes.
- iii. Understand the oral manifestations of systemic diseases and correlate with the systemic physical signs & laboratory findings.
- iv. Understand the underlying biological principles governing treatment of oral diseases.
- v. Understand the principles of certain basic aspects of Forensic Odontology.

b) SKILLS:

The Following skills are to be developed:

- i. Microscopic study of common lesions affecting oral tissues through microscopic slides & projection slides
- ii. Study of the disease process by surgical specimens
- iii. Study of teeth anomalies/polymorphisms through tooth specimens & plaster casts.
- iv. Microscopic study of plaque pathogens
- v. Study of haematological preparations (blood films) of anaemias & leukemias
- vi. Basic exercises in Forensic Odontology such as histological methods of age estimation and appearance of teeth in injuries.

c) THEORY: 145 Hours (II yr. 25 hrs. III yr. 120 hrs.)

Sl. No:	Topics for II year	Description	Hours
1	Introduction	Scope and Outline of Oral Pathology, Broad divisions, Interrelationship with medical specialities	1
2	Developmental disturbances of oral & paraoral structures	a) Developmental disturbances of Jaws - Agnathia, Micrognathia, Macrogathia, Facial Hemihypertrophy, Facial Hemiatropy b) Developmental Disturbances of lips and palate - Congenital Lip pits and Commissural pits and fistulas	

	<p>- Double lip, Cleft lip, cleft Palate, Chelitis Glandularis, Chelitis Granulomatosa, Hereditary Intestinal Polyposis, Hereditary Melanotid</p> <p>Macule</p> <p>c) Developmental disturbances of Oral Mucosa</p> <p>- Fordyce's Granules</p> <p>- Focal epithelial Hyperplasia</p> <p>d) Developmental disturbances of gingiva</p> <p>- Fibromatosis Gingiva, Retrocuspid Papilla</p> <p>e) Developmental Disturbances of Tongue</p> <p>- Macroglossia, Microglossia, Ankyloglossia, Cleft Tongue, Fissured Tongue, Median Rhomboid Glossitis, Benign Migratory Glossitis, Hairy Tongue.</p> <p>f) Development disturbances of oral lymphoid tissue:</p> <p>- Reactive lymphoid aggregates</p> <p>- Lymphoid hamartoma</p> <p>- Angiolymphoid Hyperplasia</p> <p>- Lympho-epithelial cyst</p> <p>g) Developmental disturbances of salivary glands:</p> <p>- Aplasia, Xerostomia, Hyperplasia of the palatal glands, Atresia, Aberrancy, Stafine's cyst</p> <p>h) Developmental disturbances in size of teeth:</p> <p>- Microdontia, Macrodontia</p> <p>i) Developmental disturbances in the shape of the teeth:</p> <p>79</p> <p>- Fusion, Germination, Concrescence, Dilacerations, Talon's Cusp, Dens in Dente, Dens Evaginatus, Taurodontism, Supernumerary Roots, Enameloma</p> <p>j) Developmental Disturbances in number of teeth</p> <p>- Anodontia, Supernumerary teeth, Predeciduous and Post</p>	<p>14</p>
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		<p>Permanent dentition</p> <p>k) Developmental Disturbances in Structure of Teeth: - Amelogenesis Imperfecta, Enamel Hypoplasia, Dentinogenesis Imperfecta, Dentinal dysplasia, Regional Odontodysplasia, Shell Teeth.</p> <p>l) Developmental Disturbances in eruption of teeth: - Premature Eruptions, Eruption Sequestrum, Delayed Eruption, Multiple Unerupted teeth, Submerged Teeth.</p> <p>m) Developmental / Fissural cysts of the Oral cavity - Median palatal cyst, Globulomaxillary cyst, Median Mandibular cyst, Naso-alveolar cyst, Palatal cyst of neonates, Thyroglossal duct cyst, Epidermoid, and Dermoid cyst, Nasopalatine cyst.</p>	
3	Dental caries	Theories, Clinical features, Classification, Histopathology, Microbiology of Dental caries ,Immunology, Caries activity tests, Factors influencing caries	4
4	Diseases of the Pulp & Periapical tissues	<p>a) Diseases of the Dental Pulp - Pulpitis, Focal Reversible Pulpitis, Chronic Pulpitis, Pulp Polyp.</p> <p>b) Diseases of the Periapical Tissues - Periapical Granuloma, Periapical Abscess, Periapical Cyst</p> <p>c) Osteomyelitis - Acute Suppurative Osteomyelitis, Chronic Focal and Diffuse Sclerosing Osteomyelitis, Garre's Osteomyelitis</p> <p>Sequelae of periapical abscess - summary of space infections, systemic complications & significance</p> <p>Cellulitis, Ludwig's angina, Intra cranial complication of dental infection, Maxillary sinusitis, Focal infection and foci of infection</p>	6
	Topics for III Year	Description	
1	Benign and	Classification of Odontogenic, Non-Odontogenic & Salivary	

	<p>malignant tumours of Oral cavity</p>	<p>Gland Tumours. Etiopathogenesis, clinical features, histopathology, radiological features & laboratory diagnosis (as appropriate) of the following common tumours :-</p> <p>1.Odontogenic tumours</p> <p>-Classification</p> <p>Benign</p> <p>a.Odontogenic epithelium without odontogenic ectomesenchyme-Ameloblastoma, Calcifying Epithelial Odontogenic Tumour, Adenomatoid Odontogenic Tumour, Squamous Odontogenic tumour</p> <p>b.Odontogenic epithelium with Odontogenic ectomesenchyme-Ameloblastic Fibroma ,Ameloblastic fibro odontoma, Odontoma,Dentinogenic Ghost cell Tumour</p> <p>c.Odontogenic ectomesenchyme with or without included odontogenic epithelium-Peripheral and Central odontogenic fibroma, Odontogenic Myxoma, Benign cementoblastoma</p> <p>Malignant</p> <p>a.Odontogenic carcinomas: Metastasizing ameloblastoma, Ameloblastic carcinoma</p> <p>2. Non-odontogenic</p> <p>a. Benign tumours of epithelial tissue origin</p> <p>-Papilloma, Keratoacanthoma,Nevus</p> <p>b. Premalignant lesions and conditions</p> <p>-Definition, Classification</p> <p>-Epithelial dysplasia</p> <p>-Leukoplakia, Carcinoma in situ, Erythroplakia, Oral submucous fibrosis</p> <p>c. Malignant tumours of epithelial tissue origin</p> <p>-Basal cell carcinoma, Epidermoid carcinoma (Epidemiology, etiology, clinical & histological features, Grading and TNM staging), Verrucous carcinoma ,Malignant melanoma, Recent advances in diagnosis , management and prevention of Oral cancer</p> <p>d. Benign tumours of Connective tissue origin</p> <p>-Fibroma, Giant cell fibroma, Peripheral and Central ossifying fibroma,</p>	<p>1</p> <p>9</p> <p>30</p>
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		<p>Lipoma, Haemangioma(different types), Lymphangioma, Chondroma, Osteoma, Osteoid osteoma, Benign osteoblastoma, Tori and Multiple exostoses</p> <p>e. Tumour like lesions of Connective tissue origin-</p> <p>-,Peripheral ossifying fibroma</p> <p>f. Malignant tumours of Connective tissue origin</p> <p>-Fibrosarcoma, Chondrosarcoma, Kaposi's sarcoma, Ewing's sarcoma, Osteosarcoma ,Hodgkin's and Non Hodgkin's lymphoma, Burkitt's lymphoma, Multiple myeloma, Solitary Plasma cell myeloma</p> <p>g. Benign tumours of Muscle tissue origin</p> <p>-Leiomyoma, Rhabdomyoma, Congenital Epulis of new born, Granular cell tumour</p> <p>h. Benign and Malignant tumours of Nerve tissue origin</p> <p>-Neurofibroma and Neurofibromatosis, Schwannoma, Melanotic neuroectodermal tumour of infancy, Malignant Schwannoma.</p> <p>i. Metastatic tumours of Jaws and Soft tissues of Oral cavity</p> <p>3. Salivary Gland</p> <p>Benign neoplasms - Pleomorphic Adenoma, Warthin's tumour, & Oncocytoma.</p> <p>Malignant neoplasms –Malignant Pleomorphic adenoma</p> <p>Adenoid Cystic Carcinoma, Mucoepidermoid Carcinoma, Acinic Cell Carcinoma & Adenocarcinomas.</p>	8
2	Cysts of the Oral & Paraoral region	<p>Classification, etiopathogenesis, clinical features, histopathology, laboratory & radiological features (as appropriate) of</p> <p>Odontogenic cysts- Odontogenic keratocyst, Dentigerous cyst, Primordial cyst, Dental lamina cyst of newborn ,Gingival cyst of adults, Lateral periodontal cyst, Calcifying odontogenic cyst, Radicular cyst</p> <p>Non-Odontogenic cysts- Pseudocysts of jaws, Aneurysmal bone cyst, Traumatic bone cyst & soft tissue cysts of oral & paraoral region.</p>	8
3.	Non neoplastic Salivary Gland	<p>Sialolithiasis, Sialosis, Sialadenitis, Xerostomia & Ptyalism.</p> <p>Sjogren's syndrome ,Benign lymphoepithelial lesion,</p>	2

	Diseases :	Necrotizing sialometaplasia	
4.	Traumatic, Reactive & Regressive lesions of Oral Cavity :	Pyogenic granuloma, Peripheral& Central Giant cell granuloma, exostoses Fibrous Hyperplasia, Traumatic Ulcer, mucocele & Traumatic Neuroma. Attrition, Abrasion, Abfraction Erosion, Bruxism, Hypercementosis, Dentinal changes, Pulp calcifications & Resorption of teeth. Radiation effects of oral cavity, Allergic reactions of the oral cavity. -Angioedema, Stomatitis medicamentosa, Stomatitis venenata	5
5.	Microbial infections of oral soft tissues :	Microbiology, defense mechanisms including immunological aspects, oral manifestations, histopathology and laboratory diagnosis of common bacterial, viral & fungal infections namely :- Bacterial: Scarlet fever, Diphtheria, Tuberculosis, Syphilis, Actinomycoses & its complications - Cancrum Oris, Tetanus, Noma. Viral: Herpes Simplex, Varicella zoster, Measles, Mumps & HIV infection and Oral manifestation of AIDS. Fungal : Candidiasis, Histoplasmosis Immunological diseases: Recurrent Aphthous stomatitis, Bechet's syndrome, Reiter's syndrome, Sarcoidosis.	10
6.	Common non-inflammatory diseases involving the jaws	Etiopathogenesis, clinical features, radiological & laboratory values in diagnosis of: Fibrous dysplasia, Cherubism, Osteogenesis Imperfecta, Paget's bone disease, Cleidocranial dysplasia, Rickets, Achondroplasia, Marfan's syndrome , Down's syndrome and Histiocytosis X disease.	6
7.	Biopsy, Cytology and Healing of Oral wounds	Factors affecting healing of wounds -healing of extraction wound and Dry socket Biopsy-techniques, Healing of biopsy wound -Exfoliative cytology-Indications, Staining and Interpretation	4
8.	Systemic Diseases	Brief review & oral manifestations, diagnosis & significance of common Blood, Nutritional, Hormonal & Metabolic diseases of	4

	involving Oral cavity	Oral cavity. a. Blood dyscrasias-Clinico-pathological aspects and oral manifestations of Anemias, Polycythemia, Leukopenia, Neutropenia, Agranulocytosis, Chediak-Higashi syndrome, Leukocytosis, Infectious mononucleosis, Leukemias, Purpura Haemophilia b. Oral aspects of Disturbances in mineral metabolism c. Oral aspects of Avitaminosis and Hypervitaminoses d. Oral Aspects of Endocrine dysfunction	5
9.	Mucocutaneous lesions :	Etiopathogenesis, clinical features & histopathology of the following common lesions. Lichen Planus, Lupus Erythematosus, Pemphigus & Pemphigoid lesions, Erythema Multiforme, Psoriasis, Scleroderma, Ectodermal Dysplasia, Epidermolysis bullosa & White sponge nevus.	10
10.	Periodontal Diseases :	Stains, Calculus, Dental plaque Etiopathogenesis, microbiology, clinical features, histopathology & radiological features (as appropriate) of gingivitis, gingival enlargement, ANUG, chronic desquamative gingivitis periodontitis and juvenile periodontitis. Basic immunological mechanisms of periodontal disease to be highlighted.	4
11.	Diseases of TM Joint	Ankylosis, luxation and subluxation, summary of different types of arthritis & other developmental malformations, traumatic injuries & myofascial pain dysfunction syndrome.	2
12.	Diseases of the Nerves :	Facial neuralgias – Trigeminal, Sphenopalatine & Glossopharyngeal neuralgias, VII nerve paralysis, Causalgia Psychogenic facial pain & Burning mouth syndrome.	2
13.	Pigmentation of Oral tissues	Pigmentation of Oral & Paraoral region & Discolouration of teeth : Causes & clinical manifestations.	2
14.	Diseases of Maxillary Sinus	Traumatic injuries to sinus, Sinusitis, Cysts & Tumours involving antrum	2
	Principles of Basic Forensic	Introduction, definition, aims & scope. Sex and ethnic (racial) differences in tooth morphology and	

15.	Odontology	histological age estimation Determination of sex & blood groups from buccal mucosa / saliva. Dental DNA methods Bite marks, rugae patterns & lip prints Dental importance of poisons and corrosives Overview of forensic medicine and toxicology	6
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d) LABORATORY/PRACTICAL REQUIREMENTS

Students have to maintain records of laboratory procedures/work done/report of practical:

i. Oral Pathology and Microbiology

Identification of the hard tissue anomalies:

- Microdontic tooth
- Macrodontic tooth
- Gemination of tooth
- Fused teeth
- Concrescence of tooth
- Dilaceration
- Dens in dente
- Dens evaginatus
- Supernumerary root
- Hypoplastic enamel
- Fluorosis
- Abrasion
- Attrition
- Fracture tooth
- Stained tooth
- Hypercementosis
- Complex & Compound Odontomes

Examination of the following gross specimens:

- Papilloma
- Fibroma
- Torus
- Carcinoma of oral structures

Salivary Gland Tumours

Ameloblastoma

Periapical Granuloma

Dentigerous Cyst

Pulp Polyp

Histopathologic review of:

Peripheral Giant Cell Granuloma

Leukoplakia

Carcinoma in situ

Oral Submucous Fibrosis

Carcinoma of Oral Mucosa

Pleomorphic Adenoma

Malignant Pleomorphic Adenoma

Mucous extravasation cyst

Mucous retention cyst

Warthin's tumour

Adenoid cystic carcinoma

Periapical cyst

Dentigerous Cyst

Odontogenic Keratocyst

Ameloblastoma

Gingival Hyperplasia

ANUG

Lichen Planus

Pemphigus

Dental Caries

ii. Forensic Pathology

Age determination from skull.

Gustafson's method of age determination- using incisors

e) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
One or both questions can be from Oral pathology.	Essays 2x 10marks	20
A. Oral Pathology - three questions B. Oral Microbiology - one question	Short Notes 4x5marks	20
A. Oral Pathology - eight questions B. Forensic Odontology - two questions	Brief Notes 10x3marks	30
	Total	70

i. Theory

University Written	70 Marks
Viva Voce	20Marks
Internal Assessment	10 Marks

ii. Clinical:

University Clinical Examination:	80 Marks
Spotters (Specimen-identification & points in support-5x 4 Marks)	20 Marks
Histopathology slides(Diagram, Labelling and salient features) 10x4	40Marks
Forensic Odontology (Estimation of age from ground sections)	10 Marks
Clinical Work Record & Seminar	10 Marks
Internal Assessment:	20 Marks

Grand Total 200Marks

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15. PUBLIC HEALTH DENTISTRY

a) **GOAL:**

To prevent and control oral diseases and promote oral health through organized community efforts

b) **OBJECTIVES:**

i. **Knowledge:**

At the conclusion of the course the student shall have a knowledge of the basis of public health, preventive dentistry, public health problems in India, palliative care, Nutrition, Environment and their role in health, basics of dental statistics, epidemiological methods, National oral health policy with emphasis on oral health policy.

ii. **Skill and Attitude:**

At the conclusion of the course the students shall have acquired the skill of identifying health problems affecting the society, conducting health surveys, conducting health education classes and deciding health strategies. Students should develop a positive attitude towards the problems of the society and must take responsibilities in providing health and palliative care.

iii. **Communication abilities:**

At the conclusions of the course the student should be able to communicate the needs of the community efficiently, inform the society of all the recent methodologies in preventing oral disease.

PALLIATIVE CARE:

Objective of including palliative care in to the curriculum of BDS:

Objective of the curriculum is to train future dental surgeons in the basics of Palliative Medicine. Palliative medicine is the branch of medicine involved in the treatment of patients with advanced, progressive, life-threatening disease for whom the focus of care is maximising their quality of life through expert symptom management, psychological, social and spiritual support as part of a multi-professional team. Government of Kerala has declared palliative care as part of Primary Health Care. Dental surgeons come across many patients with chronic and incurable diseases like cancer, HIV-AIDS etc. Also learning the symptom, control and communication will help them to provide better care to the patients coming under their care.

Structure of the Training:

The palliative care training will be given in the third academic year. The training to include didactic sessions, role plays, discussions, case presentations

Theory*: Introduction (3 hours), Communication (5 hours), Pain management (3 hours), Nursing care (3 hours). Total 14 hours

**Classes in Palliative care to be handled by faculty in Public Health Dentistry who have undergone training in palliative care from KUHS recognised centres.*

1: Introduction to palliative care

Learning Outcomes:

The trainee will be able to discuss the philosophy and definitions of palliative care. The trainee will demonstrate that this knowledge and understanding improves his/ her clinical practice, decision-making and management of practice.

The trainee will demonstrate the knowledge, attitudes and skills required to foster timely and efficient communication between services necessary for a smooth continuum of patient care

The trainee will demonstrate the skilful application of knowledge and understanding to prepare individuals for bereavement, to support the acutely grieving person/family. This will include the ability to anticipate / recognise abnormal grief and access specialist help

The trainee will demonstrate an understanding of the theoretical basis for applied ethics in clinical practice, and be able to evaluate personal attitudes, beliefs and behaviours.

The trainee will demonstrate an awareness of, and respect for, the social and cultural values and practices of others

The trainee will recognise differences in beliefs and personal values. The trainee will be able to deal with conflicts in the beliefs and values within the clinical team. The trainee will recognise the psycho social and spiritual components of problems in advanced diseases and understand the role of non-professional members of the community in addressing them.

Block 1: Philosophy and Principles of palliative care.

Unit 1: Definitions- hospice, palliative care and terminal care, Principles of palliative care. Quality of Life (QOL), concepts of 'Good Death', grief, bereavement team work, inter and multidisciplinary teams. Role of family and community, ethics, spirituality

- Definitions of: palliative care approach; general palliative care; specialist palliative care; hospice; specialist palliative care unit; palliative medicine; supportive care

- Evolving nature of palliative care over the course of illness, including integration with active treatment, and the significance of transition points
- Differing concepts of what constitutes quality of life (including measurement) and a “good death”
- Re-adaptation and rehabilitation
- Shared care with other members of the team and community as a doctor and an individual
- Communication skills relevant to negotiating these roles
- Critical analysis of current theoretical approaches to: medical ethics, including ‘four principles (beneficence, non-maleficence, justice and respect for autonomy)
- Understanding the concept of spirituality

2: *Psychological issues and communication*

Learning Outcomes:

The trainee will demonstrate knowledge and understanding of psychological responses to illness in a range of situations, and skills in assessing and managing these in practice

The trainee will demonstrate good communication skills and use of reflective practice to ensure these skills are maintained.

The trainee will be able to identify obstacles to communication and demonstrate skills in overcoming these.

The trainee will demonstrate a professional attitude to confidentiality

Block 1: *Communication.*

Unit 1: Communication- Different types, barriers, how to overcome?

Unit 2: Breaking bad news, and handling uncertainty, collusion, denial, anxiety, depression, anger

- Skills in active listening, open questioning and information giving to:
- elicit concerns across physical, psychological, social and spiritual domains
- managing awkward questions and information giving, sensitively and as appropriate to wishes and needs of the individual
- facilitate decision making and promote autonomy of the individual patient
- Ensure that the patient is apprised of arrangements for the continuity of their care and whom to contact in case of need.

- Knowledge of theories and evidence base for communication practice including breaking bad news, collusion and discussing natural death
- Awareness of different styles of communications and critical evaluation of own consulting skills
- Awareness of common barriers to communication for both patients and professionals
- Awareness of common communication problems: deafness, expression and learning disabilities
- A professional understanding of the ethical and legal aspects to confidentiality

Block 2: *The family in palliative care.*

Unit 1: Terminal/ Chronic illnesses- problems of families.

Unit 2: Coping with the problems - patient to family, family to palliative Care worker, patient to palliative care worker

3: *Management of pain*

Learning outcomes:

The trainee will have the knowledge, understanding and skills to manage pain in patients with life limiting progressive diseases

Block 1: *Pharmacological Management of pain.*

Unit 1: General considerations, pathophysiology, types and assessment of pain

Unit 2: WHO analgesic ladder

Unit 3: Opioids, nonopioid analgesics and adjuvants in pain management.

Unit 4: Neuropathic pain, diagnosis and management

Unit 5: Other Pains- Breakthrough pain, incident pain, end of dose pain –management

Unit 6: Relevant invasive procedures for pain management.

4: *Nursing Care*

Learning outcomes:

The trainee will inculcate knowledge and skills required to identify, manage and refer problems in need of specific nursing interventions during the course of palliative care

Block 1: *Mouth care & nutrition*

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Unit 1: Management of oral problems in advanced/terminal disease

Unit 2: Nutritional requirements in chronic /terminal disease.

Block 2: Wound care

Unit 1: Prevention and Management of Pressure sores, fungating and Painful ulcers

Unit 2: Management of bleeding from wounds.

c) THEORY: 74 HOURS (III yr. 24hrs, Final Yr. Part I. 50 hrs)

Sl.No.	Topic	No. of hours
1.	Introduction to Dentistry: Definition of Dentistry, History of dentistry, Scope, aims and objectives of Dentistry.	3
2.	Public Health:	
	i. Health & Disease: - Concepts, Philosophy, Definition and Characteristics	4
	ii. Public Health: - Definition & Concepts, History of public health	1
	iii. General Epidemiology: - Definition, objectives, methods	3
	iv. Environmental Health: - Concepts, principles, protection, sources, purification environmental sanitation of water, disposal of waste, sanitation, their role in mass disorder	3
	v. Health Education: - Definition, concepts, principles, methods, and health education aids	2
	vi. Public Health Administration: - Priority, establishment, manpower, private practice management, hospital management	1
	vii. Ethics and Jurisprudence: Professional liabilities, negligence, malpractice, consents, evidence, contracts, and methods of, identification in forensic dentistry	3
	viii. Nutrition in oral diseases	1
	ix. Behavioral science: Definition of sociology, anthropology and psychology and their relevance in dental practice and community	3
	x. Health care delivery system: Center and state, oral health policy, primary health care, national programmes, health	2

	organizations. Primary Health care counselling	
3.	Dental Public Health	
	i. Definition and difference between community and clinical health.	2
	ii. Epidemiology of dental diseases-dental caries, periodontal diseases, malocclusion, dental fluorosis and oral cancer.	6
	iii. Survey procedures: Planning, implementation and evaluation, WHO oral health survey methods 1997, indices for dental diseases	3
	iv. Delivery of dental care: Dental auxiliaries, operational and non-operational, incremental and comprehensive health care, school dental health.	2
	v. Payments of dental care: Methods of payments and dental insurance, government plans	2
	vi. Preventive Dentistry- definition, Levels, role of individual, community and profession, fluorides in dentistry, plaque control programmes.	5
4.	Research Methodology and Dental Statistics	
	i. Health Information: - Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes	1
	ii. Research Methodology: -Definition, types of research, designing a written protocol	1
	iii. Bio-Statistics: - Introduction, collection of data, presentation of data, Measures of Central tendency, measures of dispersion, Tests of significance, Sampling and sampling techniques-types, errors, bias, blind trails and calibration.	6
5.	Practice Management	
	i. Place and locality ii. Premises & layout iii. Selection of equipments iv. Maintenance of records/accounts/audit.	4
	v. Dentist Act 1948 with amendment. Dental Council of India and State Dental Councils Composition and responsibilities.	1
	vi. Indian Dental Association Head Office, State, local and	1

	branches.	
6.	Palliative Care	
	i. Introduction	3
	ii. Communication	5
	iii. Pain management	3
	iv. Nursing care	3

d) PRACTICALS/CLINICALS/FIELD PROGRAMME IN PUBLIC HEALTH DENTISTRY:

These exercises designed to help the student in IV and V year:

- i. Understand the community aspects of dentistry
- ii. To take up leadership role in solving community oral health programme
- iii. To gain hands on experience on research methodology

e) PRACTICALS: 200 HOURS (III Yr.60Hrs.Final Yr. Part I 140Hrs.)

Sl.No.	Exercise	No. of hours
1.	<p>Short term research project: Epidemiology & Advocacy Purpose: Apply the theory and practice of epidemiology, planning and evaluation, statistics to dental public health. Most of the students are unfamiliar with research and hence this short term project which will be divided across two years (IV and V BDS) would address this issue.</p> <p>Depending on the topic chosen student can incorporate</p> <ol style="list-style-type: none"> a) Collection of statistical data (demographic) on population in India, birth rates, morbidity and mortality, literacy, per capita income b) Incidence and prevalence of common oral diseases like dental caries, periodontal disease, oral cancer, fluorosis at national and international levels c) Preparation of oral health education material posters, models, slides, lectures, plays acting skits etc. d) Oral health status assessment of the community using indices and WHO basic oral health survey methods e) Exploring and planning setting of private dental clinics in rural, semi urban and urban locations, availment of finances for dental practices-preparing project report. 	60
2.	Field visits	100

	<p>a) Visit to primary health center-to acquaint with activities and primary health care delivery.</p> <p>b) Visit to water purification plant/public health laboratory/center for treatment of waste water and sewage water</p> <p>c) Visit to schools-to assess the oral health status of school children, emergency treatment and health education including possible preventive care at school (tooth brushing technique demonstration and oral rinse programme etc.)</p> <p>d) Visit to institution for the care of handicapped, terminally ill, physically, mentally, or medically compromised patients</p> <p>Note : Field visits should have relevance to the short term research project as far as possible</p> <p>Minimum of two visits – one per year (IV and V BDS)</p>	
3.	Preventive dentistry: in the department application of pit and fissure sealants, fluoride gel application procedure, A. R. T., Comprehensive health for 5 pts at least 2 patients.	40
4.	Statistical exercise	

Note: The colleges are encouraged to involve in the National Service Scheme. programme for students to carry out social work in rural areas.

SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
Any topic within the syllabus of Public Health Dentistry	Structured Essays 2x 10marks	20
	Short Notes 4 x 5marks	20
Any topic within the syllabus of Public Health Dentistry two questions from palliative care	Brief Notes 10x3marks	30
	Total	70

iii. Theory

University Written	70 Marks
Viva Voce	20 Marks
Internal Assessment	10 Marks

iv. Clinical:

University Clinical Examination:	80 Marks
Case history taking	10 Marks
Assessment of oral health status using any 2 relevant indices	30Marks
Spotters (Epidemiology, biostatistics, Preventive dentistry, Bioethics)	20Marks
Oral Health Education Talk/ Presentation of oral health education material/Short term student research project presentation /statistical test	15 Marks
Record	5Marks
Internal Assessment:	20 Marks

Grand Total 200Marks

16. PERIODONTOLOGY

a) OBJECTIVES:

The student shall acquire the skill to:-

- i. Perform dental scaling diagnostic tests of periodontal diseases
- ii. To use the instruments for periodontal therapy and maintenance of the same.

The student shall develop attitude to:-

- i. Impart the preventive measures namely, the prevention of periodontal diseases and prevention of the progress of the disease
- ii. Perform the treatment with full aseptic precautions
- iii. Shall develop an attitude to prevent iatrogenic diseases
- iv. To conserve the tooth to the maximum possible time by maintaining periodontal health
- v. To refer the patients who require specialist's care.

b) THEORY: 80 HOURS (III yr.30hrs,Final yr. Part I . 50 hrs)

Topic	Hours
1. Introduction, Definition of Periodontology, Periodontics, Periodontia, Brief historical background, Scope of Periodontics	1
2. Development of periodontal tissues, Micro-structural anatomy and biology of periodontal tissues in detail Gingiva. Junctional epithelium in detail, Epithelial-Mesenchymal interaction, periodontal ligament, Cementum, Alveolar bone	1
3. Defensive mechanisms in the oral cavity: Role of Epithelium, Gingival fluid, Saliva and other defensive mechanisms in the oral environment	1
4. Age changes in teeth and periodontal structures and their association with periodontal diseases and their significance in Geriatric dentistry	1
5. Classification of periodontal diseases: need for classification, Scientific basis of classification, Classification of gingival and periodontal diseases as described in World Workshop1989	1
6. Gingivitis: Plaque associated, ANUG, steroid hormone influenced, Medication influenced, Desquamative gingivitis, other forms of gingivitis as in nutritional deficiency, bacterial and viral infections etc.	1
7. Periodontitis: Adult Periodontitis, rapidly progressive Periodontitis A &B, Juvenile Periodontitis (localized, generalized, and post-juvenile), Prepubertal Periodontitis, Refractory Periodontitis	1
8. Gingival diseases: Localized and generalized gingivitis, Papillary, marginal	7

and diffuse gingivitis aetiology, pathogenesis, clinical signs, symptoms and management of	
a) Plaque associated gingivitis	
b) Systemically aggravated gingivitis (sex hormones, drugs and systemic diseases)	
c) ANUG	
d) Desquamative gingivitis-Gingivitis associated with Lichen Planus, Pemphigoid, Pemphigus, and other Vesiculobullous lesions	
e) Allergic gingivitis	
f) Infective gingivitis-Herpetic, Bacterial and Candidial	
g) Pericoronitis	
h) Gingival enlargement (classification and differential diagnosis)	
9. Epidemiology of periodontal diseases Definition of index, incidence, prevalence, epidemiology, endemic, epidemic, and pandemic Classification of indices (Irreversible and reversible), deficiencies of earlier indices used in Periodontics, Detailed understanding of Silness & Loe Plaque Index, Loe & Silness Gingival Index, CPITN &CPL, Prevalence of periodontal diseases in India and other countries. Public health significance (All these topics are covered at length under community dentistry. Hence, the topics may be discussed briefly. However, questions may be asked from the topics for examination.)	3
10. Extension of inflammation from Gingiva, mechanism of spread of inflammation from gingival area to deeper periodontal structures, Factors that modify the spread	1
11. Pocket ,Definition, signs and symptoms, classification, pathogenesis, histopathology, root surface changes and contents of the pocket	1
12. Etiology	
a) Dental Plaque (Biofilm), Definition, New concept of Biofilm , Types, composition, bacterial colonization, growth, maturation &disclosing agents, Role of dental plaque in periodontal diseases, Plaque microorganisms in detail and bacteria associated with periodontal diseases, Plaque retentive factors, Materia alba, Food debris	5
b) Calculus, Definition, Types, composition, attachment, theories of formation, Role of calculus in disease	

c) Food Impaction, Definition Types, Etiology, Hirschfield's classification, Signs, symptoms & sequelae of treatment	
d) Trauma from occlusion, Definition, Types, Histopathological changes, Role in periodontal disease, Measures of management in brief	
e) Habits, Their periodontal significance, Bruxism & Parafunctional habits, tongue thrusting, lip biting, occupational habits	
f) Iatrogenic factors,	
(i) Conservative Dentistry:-Restorations, Contact point, marginal ridge, surface roughness, overhanging restorations, interface between restoration and teeth	
(ii) Prosthodontics, Interrelationship, Bridges and other prosthesis, Pontics (types), surface contour, relationships of margins to the periodontium, gingival protection theory, muscle action theory & theory of access to oral hygiene.	4
(iii) Orthodontics, Interrelationship, removable appliances & fixed appliances, Retention of plaque, bacterial changes	
g) Systemic diseases, Diabetes, Sex hormones, nutrition (Vit.C& proteins), AIDS & periodontium, Hemorrhagic diseases, Leukemia, clotting factor disorders, PMN 1 disorder	1
13. Risk factors, Definition, Risk factors for periodontal diseases	1
14. Host response: Mechanism of initiation and progression of periodontal diseases, Basic concepts about cells, Mast cells, neutrophils, macrophages, lymphocytes, immunoglobulins, complement system, immune mechanisms & cytokines in brief, Stages in gingivitis-Initial, early, established & advanced, Periodontal disease activity, continuous paradigm, random burst & asynchronous multiple burst hypothesis	2
15. Periodontitis:	
a) Etiology, histopathology, clinical signs & symptoms, diagnosis and treatment of adult Periodontitis	
b) Periodontal abscess; definition, classification, pathogenesis, differential diagnosis and treatment	5
c) Furcation involvement, Glickman's classification, prognosis and	

management	
d) Rapidly progressive Periodontitis Juvenile Periodontitis: Localized and generalized Post juvenile Periodontitis	
e) Periodontitis associated with systemic diseases ,Refractory Periodontitis	
16. Diagnosis:	
a) Routine procedures, methods of probing, 2 types of probes, (According to case history)	3
b) Halitosis: Etiology and treatment. Mention advanced diagnostic aids and their role in brief.	
17. Prognosis, Definition, types, purpose and factors to be taken into consideration	1
18. Treatment plan Factors to be considered	1
19. Periodontal therapy	
a) General principles of periodontal therapy. Phase I, II, III, IV therapy.	
b) Definition of periodontal regeneration, repair, new attachment and reattachment	
c) Plaque control	5
(i) mechanical :tooth brushes, Interdental cleaning aids, dentifrices	
(ii) Chemical: classification and mechanism of action of each & pocket irrigation	
20. Pocket eradication procedures	
a) Scaling and root planning: Indications, Aims & objectives, Healing following root planning, Hand instruments, sonic, ultrasonic & Piezo-electric Scalers	
b) Curettage: Definition Indications present concepts Aims & objectives, Procedures & healing response	5
c) Flap surgery: Definition, Types of flaps, Design of flaps, papilla preservation Indications & contraindications, Armamentarium, Surgical procedure & healing response	
21. Osseous Surgery:	
a) Osseous defects in periodontal disease, Definition, Classification	6
b) Surgery: resective, additive osseous surgery (osseous grafts with	

classification of grafts)	
c) Healing responses	
d) Other regenerative procedures; root conditioning	
e) Guided tissue regeneration	
22. Mucogingival surgery & periodontal plastic surgery:	
a) Definition, Mucogingival problems: etiology,	
b) classification of gingival recession (P.D.Miller Jr. and Sullivan and Atkins), Indications, objectives	5
c) Gingival Augmentation procedures apical and coronal to recession :	
d) Frenectomy, Frenotomy	
e) Crown lengthening procedures	
f) Periodontal microsurgery in brief	
g) Splints: Periodontal splints, Purpose & classification, Principles of splinting	1
h) Hypersensitivity, Cause, theories & Management	1
i) Implants: Definition, types, scope & biomaterials used, Periodontal considerations: such as Implant-bone interface, Implant-Gingiva interface, Implant failure, Peri-implantitis &management	1
23. Maintenance phase (SPT):	
a. Causes, Theories & management	
b. Aims, objectives, and principles	4
c. Importance	
d. Procedures	
e. Maintenance of implants	
24. Pharmacotherapy:	
a. Periodontal dressings	4
b. Antibiotics & anti-inflammatory drugs	
c. Local drug delivery systems	
25. Periodontal management of medically compromised patients: Topics concerning periodontal management of medically compromised patients	2
26. Inter-disciplinary care: Pulpo-Periodontal involvement, Routes of spread of infection, Simons classification, Management	1
27. Systemic effects of periodontal diseases in brief: Cardiovascular diseases,	1

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Low birth weight babies etc.	
28. Infection control protocol: Sterilization and various aseptic procedures	1
29. Ethics.	1

c) TUTORIALS DURING CLINICAL POSTING:

- i. Infection control
- ii. Periodontal instruments
- iii. Chair position and principles of instrumentation
- iv. Maintenance of instruments (sharpening)
- v. Ultrasonic, Piezoelectric and sonic scaling - demonstration of technique
- vi. Diagnosis of periodontal disease and determination of prognosis
- vii. Radiographic interpretation and lab investigations
- viii. Motivation of patients- oral hygiene instructions
- ix. Students should be able to record a detailed periodontal case history, determine diagnosis, prognosis and plan treatment.
- x. Student should perform scaling, root planing local drug delivery and SPT.
- xi. Shall be given demonstration of all periodontal surgical procedures.

d) DEMONSTRATIONS:

- i. History taking and clinical examination of the patients
- ii. Recording different indices
- iii. Methods of using various scaling and surgical instruments
- iv. Polishing the teeth
- v. Bacterial smear taking
- vi. Demonstration to patients about different oral hygiene aids
- vii. Surgical procedures- gingivectomy, gingivoplasty, and flap operations
- viii. Follow up procedures, post operative care and supervision

e) MINIMUM CLINICAL REQUIREMENTS MANDATORY TO APPEAR FOR UNIVERSITY EXAMINATION:

- i. Diagnosis, treatment planning, and discussion and total periodontal treatment- 10 cases (5 Long cases + 5 Short Cases)
- ii. Supra gingival scaling 50 complete cases (including minimum 2 ultrasonic scaling) and oral hygiene instructions –
- iii. Sub gingival Scaling and Root Planing - 10 cases

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- iv. Assistance in periodontal surgery- 2 cases
- v. A work record should be maintained by all the students and should be submitted at the time of examination after due certification from the head of the department.
- vi. Students should have to complete the work prescribed by the concerned department from time to time and submit a certified record for evaluation.



f) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
Questions from any of the Periodontology Topics	Structured Essays 2x 10marks	20
	Short Notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	70

v. Theory

University Written	70 Marks
Viva Voce	20 Marks
Internal Assessment	10 Marks

vi. Clinical:

University Clinical Examination:	80 Marks
Case History, Clinical Examination, Diagnosis & Treatment Planning	30Marks
Oral prophylaxis	30 Marks
Clinical Work Record & Seminar	20 Marks
Internal Assessment:	20 Marks

Grand Total 200Marks

सर्वे भयन्तु सुखिनः

17. ORAL MEDICINE AND RADIOLOGY

a) AIM

- i. To train the students to diagnose the common disorders of Orofacial region by clinical examination and with the help of such investigations as may be required and medical management of oro-facial disorders with drugs and physical agents.
- ii. To train the students about the importance, role, use and techniques of radiographs and other imaging methods in diagnosis.
- iii. The principles of the clinical and radiographic aspects of Forensic Odontology.

b) COURSE CONTENT

- i. The syllabus in ORAL MEDICINE & RADIOLOGY is divided into two main parts.
Part-I: Diagnosis, Diagnostic methods and Oral Medicine {which is again subdivided into three sections. (a) Diagnostic methods (b) Diagnosis and differential diagnosis (c) Oral Medicine & Therapeutics} and Part-II: Oral Radiology. Emphasis should be laid on oral manifestations of systemic diseases and ill-effects of oral sepsis on general health.
- ii. To avoid confusion regarding which lesion and to what extent the student should learn and know, this elaborate syllabus is prepared. As certain lesions come under more than one group, there is repetition.

c) THEORY: 75 HOURS (III YR. 25 HRS, FINAL YR. PART. I. 50 HRS.)

THEORY TOPICS FOR THIRD YEAR (25 Hrs)		
Sl No	Oral Medicine Topics	Hours
1.	Introduction to oral medicine, terminologies & Ethics (Professional liabilities, negligence, malpractice, consent etc)	1
2.	Case history and clinical examination (examination of soft tissues and hard tissues, primary & secondary lesions, lymph nodes, TMJ, muscles of mastication, salivary glands, swelling, ulcer, white & red lesions, pigmented lesions)	2
3.	Lymphatic drainage of head and neck. D/d of cervical lymphadenopathy	1
4.	Investigations in oral medicine (chair side and laboratory investigations including haematological, microbiological, immunologic, biochemical and biopsy).	2
5.	Dental therapeutics (drugs commonly used: antibiotics, anti-inflammatory, analgesics, anaesthetics, steroids, topical applications, coagulants & anticoagulants, sialogogues).	2
6.	Emergencies in dental practice	1
7.	Developmental disorders of the teeth & paradental structures	1
8.	Acute and chronic infections of the jaws (sequelae of dental infection, spread of infection, facial space infections, osteomyelitis, foci of oral infections)	1
9.	Disorders of tongue	1
Total Oral Medicine teaching hours in third year		12
Radiology Topics		
1.	History of dental radiology, Radiation Physics (electromagnetic spectrum, properties of X rays)	1

2.	Construction and working of x-ray tube, production of X-rays, factors controlling x-ray beam, interaction of x-rays with matter	2
3.	Radiation biology.	1
4.	Radiation protection.	1
5.	Films used in dental radiology, grids and intensifying screen	1
6.	Intraoral radiographic techniques (periapical, bitewing, occlusal & localization techniques).	2
7.	Processing of X-ray films.	1
8.	Qualities of an ideal radiograph.	1
9.	Infection control and Quality assurance in Dental Radiology	1
10.	Radiographic normal anatomical landmarks.	2
Total Radiology teaching hours in third year		13
THEORY TOPICS FOR FINAL YEAR PART I (50 Hrs)		
Sl	Oral Medicine Topics	Hours
1.	Oro Facial pain (Classification, differential diagnosis & management)	2
2.	White & Red lesions (classification, differential diagnosis and Management).	2
3.	Vesiculobullous & Ulcerative lesions (classification, differential diagnosis, management, a	2
4.	Bacterial (Bacterial, Viral & Fungal infections)	1
5.	Viral Infections of oral and paraoral structures	2
6.	Fungal Infections of oral and paraoral structures	1
7.	Granulomatous diseases affecting orofacial region	1
8.	Nutritional deficiencies (Vitamins, Minerals)	1
9.	Pigmented lesions affecting oral mucosa (exogenous & endogenous, differential	1
10.	RBC & WBC disorders (oral manifestations & dental considerations)	2
11.	Bleeding & Clotting disorders (Oral manifestations & Dental considerations)	1
12.	System review in oral medicine - Endocrine (Pituitary, thyroid, Parathyroid, Adrenal,	1
13.	System review in oral medicine - CVS (oral manifestation & dental considerations)	1
14.	System review in oral medicine - CNS , GIT & Respiratory System (oral	2
15.	System review in oral medicine - Renal System (oral manifestation & dental	1
16.	Saliva as a diagnostic tool and salivary gland disorders (developmental, functional,	2
17.	TMJ disorders (classification, developmental disorders, degenerative disorders, disc	1
18.	Benign & malignant non - odontogenic tumors of the orofacial region (epithelial,	1
19.	Fibroosseous lesions of jaws	1
20.	Cysts & of orofacial region (Odontogenic & Non Odontogenic).	1
21.	Odontogenic Tumors	1
22.	Oral Cancer (Etiology, pathogenesis, clinical features, Diagnosis, management &	2
23.	Forensic odontology	2
Total Oral Medicine teaching hours in final year part I		33
Radiology Topics		
1.	Principles of radiographic interpretation.	1
2.	Faulty radiographs :- Causes and rectification	1
3.	Role of radiography in diagnosis of dental caries & periodontal disease.	1
4.	Periapical radiolucencies & Generalized rarefactions of jaws	1
5.	Pericoronar radiolucencies	1
6.	Multilocular radiolucencies	1

7.	Radiopacities in jaws	1
8.	Mixed radiopaque - radiolucent lesions of jaws.	1
9.	Panoramic Radiography	1
10	Extra oral radiography & Imaging of maxillary sinus	1
11	TMJ radiography & Radiographic features of the diseases of TMJ.	1
12	Salivary gland imaging & Radiographic features of the diseases of salivary glands	1
13	Radiography of traumatized teeth & jaws	1
14	Contrast radiography, Radioisotopes & Scintigraphy	1
15	Digital radiography.	1
16	Recent imaging modalities and its application in dentistry (CT, CBCT, MRI & USG)	1
17	Role of radiographs in Forensic odontology	1
Total Radiology teaching hours in Final year Part I		17

d) CLINICALS:

1. Training in:

- Patient examination
- Patient assessment
- Treatment planning
- Medications if any, with dose
- Follow up protocols

2. In view of the above each student shall maintain a record of work done, which shall be evaluated for marks at the time of university examination.

3. The minimum clinical requirement to appear for University examination is listed below:

Minimum clinical and academic requirements (Year wise split up)

Third Year

SI No	Procedure	Minimum requirement
1	Short cases (routine OP)	40
2	Observation of specialty cases in the PG Clinic	5
3	Observation of minor surgical procedures	2
4	*Seminar on basic topics	1

Final year Part I

SI No	Procedure	Minimum requirement
1	Short cases (routine OP)	60
2	Long Cases	10
3	Assisting minor surgical procedures	2
4	Taking & interpretation of IOPA radiographs	20
5	Taking & interpretation of Bitewing radiographs	2
6	Taking & interpretation of Occlusal radiographs	2
7	Observation of Specialized imaging modalities like panoramic & skull radiographs, CBCT, USG etc...	4
8	Seminars	2 (One Oral Medicine & One Radiology topic)

e) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
One question from oral medicine and one from radiology	Structured Essays 2x 10marks	20
A. Diagnostic Methods – Two questions B. Differential Diagnosis - two questions C. Therapeutics– Two question D. Radiation Physics – One question E. Techniques – Two Questions F. Radiographic Interpretation – One Question	Short Notes 4 x 5marks	20
A. Four Questions from Oral Medicine B. Four Questions from Radiology C. Two from Forensic Odontology	Brief Notes 10x3marks	30
Total		70

vii. Theory

University Written	70 Marks
Viva Voce	20 Marks
Internal Assessment	10 Marks

viii. Clinical:

University Clinical Examination: 80 Marks

Spotters (1 mark each)	1x 10	10 Marks
Discussion Long Case	1x30	30 Marks
Taking and Interpretation of Radiograph	1x30	30 Marks
Work Record and seminar		10 Marks

Internal Assessment: 20 Marks

Grand Total 200 marks

18. ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS

a) AIM

Undergraduate programme in Orthodontics is designed to enable the qualifying dental surgeon to diagnose, analyze and treat common orthodontic problems by preventive, interceptive and corrective orthodontic procedures

b) COURSE CONTENT

The undergraduate study of orthodontics spans over second year, third year and fourth year. In second year the emphasis is given for basic and preclinical wire bending exercises and appliance fabrication. In third year the student has to undergo clinical postings where patient care and appliance management is emphasized. In fourth year of study the candidate will be allotted with long cases for detailed discussion treatment plan formulation appliance construction, insertion and management. In addition they will be trained to attend routine out patients, appliance activation, cephalometric interpretation etc.

c) SKILLS

- i. To diagnose a case of malocclusion and formulate a treatment plan
- ii. To make a good alginate impression
- iii. To fabricate a good study model
- iv. To perform various model analysis and cephalometric analysis
- v. To construct routine removable and myofunctional appliances using cold cure acrylic
- vi. Insertion and management of appliance

d) INTEGRATION

By learning the science of Orthodontics, the student should be able to diagnose different types of malocclusion, develop a treatment plan and manage simple malocclusions. The student should acquire skills to recognize Complex malocclusions and the same may be referred to a specialist.

This insight is gained in a variety of ways:

- i. Pre clinical training
- ii. Lectures & small group teaching
- iii. Demonstrations
- iv. Spot diagnosis and discussions
- v. Long case discussions
- vi. Seminar presentations

e) AN OUTLINE OF THE COURSE CONTENT:

Study of clinical Orthodontics to enable the student to understand the science and art of orthodontics

f) THEORY: 70 Hours (III yr. 20hrs, Final yr. Part. I. 50 Hrs)

Sl no	Topics for III year	Hours
1	Introduction definition historical background aims and objectives of orthodontics and need for orthodontic care	1
2	Growth and development –General principles. Definition, growth spurts and differential growth, factors influencing growth and development, methods of measuring growth, Growth theories (Genetic, Sicher's, Scott's, Moss's, Petrovic's, Multifactorial) 1.Genetic and epigenetic factors in growth 2. Cephalocaudal gradient in growth. 3.Morphologic Development Of Craniofacial Structures a. Methods of bone growth b. Prenatal growth of craniofacial structures c. Postnatal growth and development of: cranial base, maxilla, mandible, dental arches and occlusion. 4. Functional Development of Dental Arches and Occlusion a. Factors influencing functional development of dental arches and occlusion. b. Forces of occlusion c. Wolfe's law of transformation of bone d. Trajectories of forces 5. Clinical Application Of Growth And Development Normal And Abnormal Function Of Stomatognathic System	7
3	Occlusion and Malocclusion in general a. Concept of normal occlusion b.. Definition of malocclusion c. Description of different types of dental, skeletal and functional malocclusion. Classification of Malocclusion	4

	Principle, description, advantages and disadvantages of classification of malocclusion by Angle's, Simon's, Lischer's and Ackerman and Proffitt's.	
4	Etiology of malocclusion a. Definition, importance, classification, local and general etiological factors. b. Etiology of various types of malocclusion.	2
5	Diagnosis And Diagnostic Aids a. Definition, Importance and classification of diagnostic aids b. Importance of case history and clinical examination in orthodontics c. Study Models: - Importance and uses - Preparation and preservation of study models d. Importance of intraoral X-rays in orthodontics e. Panoramic radiographs: - Principles, Advantages, disadvantages and uses f) Cephalometrics: Its advantages, disadvantages 1. Definition 2. Description and use of cephalostat 3. Description and uses of anatomical landmarks lines and angles used in Cephalometric analysis 4. Analysis- Steiner's, Down's, Tweed's, Witts, Ricket's-E- line g. Electromyography and its uses in orthodontics h. Wrist X-rays and its importance in orthodontics	5
	Topics for Final year (Part I)	
1	Preventive orthodontics Definition and Different procedures undertaken in preventive orthodontics and their limitations	2
2	Interceptive orthodontics a. Definition b. Different procedures undertaken in interceptive orthodontics c. Serial extractions: Definition, indications, contra-indication, technique, advantages and disadvantages. d. Role of muscle exercises as an interceptive procedure	3
3	General principles in orthodontic treatment planning	2

4	Anchorage Anchorage in Orthodontics - Definition, Classification, Types and Stability Of Anchorage	2
5	Biomechanical principles in orthodontic Tooth Movement a. Different types of tooth movements b. Age factor in orthodontic tooth movement	2
6	Biology of tooth movement Tissue response to orthodontic force application	2
7	Methods of gaining space Proximal stripping Extractions Expansions Distalisation Proclination of anteriors and de-rotation of posteriors	7
8	Orthodontic appliances – general Indications, classifications, advantages and disadvantages	2
9	Removable orthodontic appliances Components, indications, advantages and disadvantages	2
10	Fixed orthodontic appliances Historical development, various systems, components, advantages disadvantages.	2
11	Myo functional appliances Definition, classification, various appliances like activator, Frankel, Twinblock, bionator and fixed functional appliances	5
12	Orthopaedic appliances Head gear, face mask and chin cap	3
13	Cleft lip and palate – orthodontic management	2
14	Surgical orthodontics – general Minor surgical procedures Major surgical procedures Surgical decompensation	3
15	Principles of management of various malocclusions Deep bite, open bite, cross bites, midline diastema, class I, II and III malocclusion	3

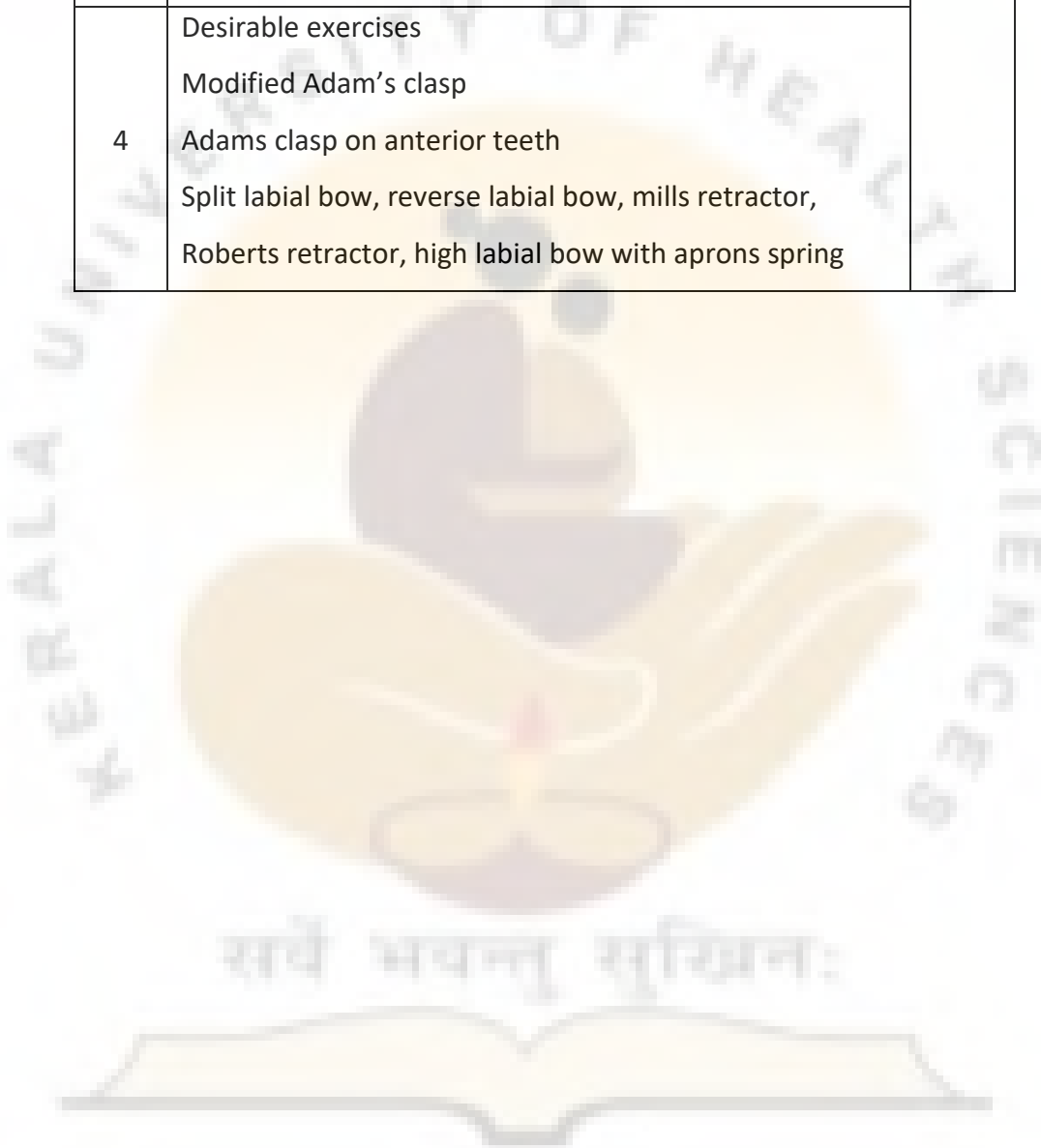
16	Adult orthodontics	2
17	Retention and relapse Schools of thought, theorems of retention, various fixed and removable retainers	2
18	Computers and recent developments in orthodontics	2
19	Genetics	1
20	Ethics	1
21	Miscellaneous topics a) Soldering and welding b) Sterilization c) Laboratory procedures.	1

g) CLINICAL TRAINING

Sl no	Training In III year	Hours
1	Model analysis <ul style="list-style-type: none"> • Pont's analysis • Ashley Howe's analysis • Carey's analysis • Bolton's analysis • Moyer's mixed dentition analysis 	60
2	Cephalometric analysis <ul style="list-style-type: none"> • Down's analysis • Steiner's analysis • Tweed's analysis • Witts appraisal 	
3	Short cases <ul style="list-style-type: none"> • Impressions • Model fabrication • Wire bending • Acrylization • Trimming and polishing • Insertion of appliance 	
Training In Final year (Part I)		
1	Long case taking <ul style="list-style-type: none"> • Case taking 	140

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	<ul style="list-style-type: none"> • Model analysis • Discussion • Appliance fabrication and insertion 	
2	<p>Short cases</p> <ul style="list-style-type: none"> • Spot diagnosis and spot discussion • Appliance fabrication and insertion 	
3	Attending O P cases and appliance review	
4	<p>Desirable exercises</p> <p>Modified Adam's clasp</p> <p>Adams clasp on anterior teeth</p> <p>Split labial bow, reverse labial bow, mills retractor, Roberts retractor, high labial bow with aprons spring</p>	



h) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
Growth and development, classification and etiology of malocclusion, diagnostic aids, interceptive orthodontics, anchorage, biomechanics, biology of tooth movement, methods of gaining space, myofunctional appliances, orthopaedic appliances, retention and relapse	Structured Essays 2x 10marks	20
Introduction and historical background, growth and development, occlusion and malocclusion – classification and etiology. Diagnostic aids, skeletal maturity indicators, preventive and interceptive orthodontics, general principles of treatment planning, anchorage, biomechanics, biology of tooth movement, methods of gaining space, orthodontic appliances – removable and fixed appliances, myo-functional and orthopaedic appliances, management of various malocclusions, management of cleft lip and palate, surgical orthodontics, adult orthodontics, retention and relapse, computers in orthodontics, genetics and ethics.	Short Notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	70

ix. Theory

University Written	70 Marks
Viva Voce	20Marks
Internal Assessment	10 Marks

x. Clinical:

University Clinical Examination:	80 Marks
Case Presentation	40Marks
Impression Making	20 Marks
Spotters (10 x 1 Marks)	10 Marks
Clinical Work Record/Seminar/Assignment	10 Marks
Internal Assessment:	20 Marks

Grand Total 200Marks

19. ORAL & MAXILLOFACIAL SURGERY

a) *AIM*

To produce a graduate who is competent in performing extraction of teeth and minor surgeries under both local and general anaesthesia, prevent and manage related complications, acquire knowledge regarding aseptic procedures, have reasonable understanding of management of infectious patients and prevention of cross infections, learn about BLS, acquire a reasonable knowledge and understanding of the various diseases, injuries, infections occurring in the Oral & Maxillofacial region and offer solutions to such of those common conditions and has an exposure in to the in-patient management of maxillofacial problems and also to acquire reasonable knowledge regarding the surgical principals involved in implant placement and be able to communicate properly and understand medico legal responsibilities

b) *OBJECTIVES:*

i. *Knowledge & Understanding*

At the end of the course and the clinical training the graduate is expected to –

- (1) Able to apply the knowledge gained in the preclinical subjects and related medical subjects like general surgery and general medicine in the management of patients with oral surgical problem.
- (2) Able to diagnose, manage and treat (understand the principles of treatment of) patients with oral surgical problems.
- (3) Knowledge of range of surgical treatments.
- (4) Ability to decide the requirement of a patient to have oral surgical specialist opinion or treatment.
- (5) Understand the principles of in-patient management.
- (6) Understand the principles of emergency management of maxillofacial injuries, BLS measures and the medico legal responsibilities and formalities.
- (7) Understanding of the management of major oral surgical procedures and principles involved in patient management.
- (8) Be able to decide the need for medical/ surgical consultations and the method of doing so.
- (9) Should know ethical issues and have communication ability.
- (10) Should know the common systemic and local diseases, drugs used and drug interactions
- (11) Death Certification & legal aspects of forensic medicine

ii. *Skills:*

A graduate should have acquired the skill to:

- (1) Examine any patient with an oral surgical problem in an orderly manner.

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- (2) Be able to understand requisition of various clinical and laboratory investigations and is capable of formulating differential diagnosis.
- (3) Should be competent in the extraction of teeth under both local and general anesthesia.
- (4) Should be able to carry out certain minor oral surgical procedures under L.A. simple impactions, draining of abscesses, simple dental wiring, biopsies etc.
- (5) Ability to assess, prevent and manage various complications during and after surgery.
- (6) Able to provide primary care and manage medical emergencies in the dental office.
- (7) Understanding of the management of major oral surgical problems and principles involved in inpatient management.
- (8) Should be competent in measures necessary for homeostasis and wound closures.

c) THEORY: 70 HOURS (III Yr. 26 hrs, Final Yr. Part I. 20 hrs. Part II. 30 hrs.)

Sl. No.	Topics	Description	Hours
Topics for III Year			
1.	Introduction	<p>Definition, scope, aims and objectives.</p> <p>Diagnosis in oral surgery: History taking, Clinical examination, Investigations.</p> <p>Principles of infection control and cross-infection control with particular reference to HIV/AIDS and Hepatitis.</p>	1
2.	Principles of Oral Surgery	<p>1) Asepsis:</p> <p>Definition</p> <p>Measures to prevent introduction of infection during Surgery.</p> <p>Preparation of the patient,</p> <p>Measures to be taken by operator,</p> <p>Sterilization of instruments - various methods of sterilization etc,</p> <p>Principles and need for cleaning of infected/ used instruments prior to re sterilization</p> <p>Surgery set up.</p> <p>2) Painless Surgery:</p>	4

		<p>Pre- anesthetic considerations</p> <p>Pre-medication: purpose, drugs used</p> <p>Anesthetic considerations a) Local b)</p> <p>Local with IV sedations</p> <p>Use of general anesthetic</p> <p>3) Access:</p> <p>Intra-oral: Mucoperiosteal flaps, principles, commonly used intraoral incisions.</p> <p>Bone Removal: Methods of bone removal. Use of Burs: Advantages & precautions Bone cutting instruments: Principles of using chisel & osteotome.</p> <p>Extra-oral. Skin <i>incisions - principles, various extra-oral incision to expose facial skeleton.</i> a) Submandibular b) Pre auricular Incision for TMJ, Access to maxilla & orbit , Bi coronal incision</p> <p>4) Control of hemorrhage during surgery</p> <p>Normal Haemostasis</p> <p>Local measures available to control bleeding</p> <p>Hypotensive anaesthesia etc.</p> <p>5) Drainage & Debridement</p> <p>Purpose of drainage in surgical wounds</p> <p>Types of drains used</p> <p>Debridement: purpose, soft tissue & bone debridement.</p> <p>6) Closure of wounds</p> <p>Type wounds, Classification of wounds</p> <p>Suturing: Principles</p> <p>Suture material: Classification, ideal requirements</p> <p>Body response and resorbability of</p>	
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		<p>various materials etc.</p> <p>7) Post operative care</p> <p>Post operative instructions</p> <p>Physiology of cold and heat in the control of pain and swelling</p> <p>Analgesics and anti-inflammatory drugs in the control of pain and swelling</p> <p>Control of infection – antibiotics, principles of antibiotic therapy, prevention of antibiotic abuse</p> <p>Long term post operative follow up - significance.</p>	
3.	Local Anaesthesia	<p>Introduction and Neurophysiology</p> <p>Concept of LA</p> <p>Classification of local anesthetic agents</p> <p>Ideal requirements, Mechanism of action, Armamentarium required</p> <p>Types of local anaesthesia</p> <p>Use of vaso constrictors in local anesthetic solution -Advantages, contra-indications, Various vaso constrictors used.</p> <p>Anaesthesia of the mandible -Pterygomandibular space - boundaries, contents etc. Intra oral and extra oral techniques of Inferior Alveolar Nerve Block, Mandibular Nerve Block, Mental Nerve Block, Infiltrations, etc.</p> <p>Anaesthesia of Maxilla – Infiltrations, Infra - orbital nerve block, Posterior superior alveolar nerve block, Infiltrations, Maxillary nerve block – Intra oral and extra oral Techniques</p> <p>Complications of local anaesthesia- local and systemic</p> <p>Disposal of sharp instruments</p>	5

4.	General Anaesthesia	<p>Concept of general anaesthesia.</p> <p>Indications of general anaesthesia in dentistry.</p> <p>Pre-anesthetic evaluation of the patient.</p> <p>Pre-anesthetic medication - advantages, drugs used.</p> <p>Conscious sedation</p> <p>Commonly used anesthetic <i>agents</i>.</p> <p>Complication during and after G.A.</p> <p>I.V. sedation with Diazepam and Midazolam.</p> <p>Indications, mode of action, technique etc.</p> <p>Cardiopulmonary resuscitation</p> <p>Use of oxygen and emergency drugs.</p> <p>Tracheostomy.</p>	2
5.	Exodontia	<p>General considerations</p> <p>Ideal Extraction.</p> <p>Indications/ contra indications for extraction of teeth</p> <p>Extractions in medically compromised patients.</p> <p>Methods of extraction</p> <p>Forceps or intra-alveolar or closed method.</p> <p>Principles, types of movement, force, role of left hand etc.</p> <p>Trans-alveolar, surgical or open method</p> <p>Indications, surgical procedure.</p> <p>Dental elevators, uses, classification, principles in the use of elevators, commonly used elevators.</p> <p>Armamentarium, Complications</p> <p>Complications during exodontia Common to both maxilla and mandible.</p> <p>Post-operative complications</p> <p>Prevention and management of complications.</p>	4
6.	Medical Emergencies in dental practice	<p>Primary care of medical emergencies in dental practice</p> <p>(a) Cardio vascular (b) Respiratory (c) Endocrine</p>	3

		(d) Anaphylactic reaction (e) Epilepsy Basic Life Support	
7.	Emergency drugs & Intra muscular and I.V. Injections	Emergency drugs required in a dental clinic Applied anatomy. Sites for intra muscular and intra venous injections, techniques etc.	1
8.	Death Certification & legal aspects of Forensic medicine.(classes to be handled by faculty from the department of forensic medicine of a recognized medical college)*	Legal procedure and courts	1
		Medicolegal Autopsy, Objective, Procedure - Exhumation	2
		Sudden and unexpected death	1
		Forensic traumatology -Mechanical injuries, Medicolegal aspect of injury, Head injury, Transportation injuries	1
		Dental investigation in mass disaster incidents	1
Topics for Final year (Part I)			
9.	Impacted teeth	<p>i. Incidence, definition, etiology.</p> <p>ii. Impacted mandibular third molar Classification, reasons for removal Assessment - both clinical & radiological. Armamentarium and surgical procedures for removal. Complications during and after removal, its prevention and management.</p> <p>iii. Maxillary third molar, Indications for removal, classification, Armamentarium and surgical procedure for removal, Complications during and after removal, its prevention and management.</p> <p>iv. Impacted maxillary canine. Reasons for canine impaction, indications for removal, Methods of management, Localization, labial and palatal approaches, Complications during and</p>	4

		after removal, its prevention and management Surgical exposure, Transplantation	
10.	Neurological Diseases	i. Trigeminal neuralgia - definition, etiology, clinical features and methods of management including medical and surgical. ii. Facial paralysis - etiology, clinical features. iii. Nerve injuries - Classification, clinical features and management, Nerve Grafting -Neuropathy etc.	3
11.	Implants	Concept of osseointegration, History of implants their design & surface characteristics. Knowledge of various types of implants, Bone biology, Morphology, Classification of bone and its relevance to implant placement. Bone augmentation materials. Soft tissue considerations in implant dentistry. Surgical procedure to place implants.	2
12.	Diseases of the maxillary sinus	Surgical anatomy and development of the sinus. Sinusitis both acute and chronic Surgical approach of sinus - Cald well-Luc procedure, Knowledge of FESS, Removal of root from the sinus. Oro-antral fistula and communications- etiology, clinical features and surgical methods for closure.	2
13.	Cysts of the mouth and jaws	Definition, classification, pathogenesis. Diagnosis - Clinical features, radiological, FNAC, use of contrast media and histopathology. Management - types of surgical procedures. Rationale of the techniques, indications, contraindications, procedures, complications etc.	4
14.	Jaw deformities	Basic forms - Prognathism, Retrognathism and open bite. Reasons for correction.	3

		<p>Diagnosis and treatment planning</p> <p>Outline of surgical methods carried out on mandible and maxilla-subapical, body, sagittal split osteotomy, genioplasty, anterior maxillary Osteotomy, Le fort I osteotomy</p> <p>Role of distraction osteogenesis in correction of jaw deformities</p>	
15.	Pre-prosthetic Surgery	<p>Definition</p> <p>Classification of procedures</p> <p>Corrective procedures: Alveoloplasty, Reduction of maxillary tuberosities, Frenectomies and removal of tori.</p> <p>Ridge extension or Sulcus extension procedures, Indications and various surgical procedures</p> <p>Ridge augmentation and reconstruction.</p> <p>Indications, use of bone grafts, hydroxyapatite etc</p>	2
Topics for Final year (Part II)			
16.	Cleft Lip and Palate	<p>Etiology of the clefts, incidence, classification</p> <p>Role of dental surgeon/ maxillofacial surgeon in the cleft team.</p> <p>Outline of the closure procedures,</p>	1
17.	Infections of the Oral cavity	<p>Introduction, surgical anatomy of the superficial and deep fasciae of head and neck</p> <p>Factors responsible for infection, pathogenicity, virulence</p> <p>Dento-alveolar abscess - aetiology, clinical features and management.</p> <p>Spread of odontogenic infections through various facial spaces and its management</p> <p>Ludwig's angina - definition, aetiology, clinical features, management and complications</p> <p>Course of odontogenic infections</p>	6
18.	Fungal Infections of head and neck	<p>Candidiasis, Actinomycosis, Coccidioidmycosis, Rhinosporidosis,</p>	1

	region	Antifungal agents	
19.	Osteomyelitis of the jaws	Definition, etiology, pre-disposing factors, classification, clinical features and management.	1
20.	Carcinoma of the oral cavity	Lymphatic Spread. TNM classification, Staging. Biopsy-types, filling of Histopathology request form Outline of management of Squamous Cell Carcinoma: surgery, radiation and chemotherapy Role of dental surgeons in the prevention and early detection of oral cancer.	2
21.	Osteoradionecrosis -	Definition, etiology, theories, pre-disposing factors, classification, clinical features and management.	1
22.	Maxillofacial Traumatology	Emergency management in maxillofacial trauma General considerations, types of fractures, aetiology, clinical features and general principles of management. Mandibular fractures - Applied anatomy, classification. Diagnosis - Clinical and radiological features, Management - Reduction -closed and open Fixation and immobilization methods outline of rigid and semi-rigid internal fixation Fractures of the condyle - etiology, classification, clinical features, principles of management Fractures of the middle third of the face. Definition of the mid face, applied surgical anatomy, classification, clinical features and outline of management. Alveolar fractures - methods of management Fractures of the Zygomatic complex and orbit. Classification, clinical features, indications for treatment, various methods of reduction and fixation	7

		<p>Faciomaxillary Injuries in Children</p> <p>Complications of fractures - delayed union, non-union and malunion.</p>	
23.	Salivary gland diseases	<p>Surgical Anatomy of Minor and Major salivary glands</p> <p>Sialography, contrast media, procedure.</p> <p>Inflammatory conditions of the salivary glands</p> <p>Sialolithiasis- Sub mandibular duct and gland , parotid duct and gland ,Clinical features, management, Intraoral and extra oral Sialolithotomy.</p> <p>Salivary fistulae, sialocoele</p> <p>Autoimmune diseases of the salivary glands, diagnosis management</p> <p>Common tumours of salivary glands like Pleomorphic adenoma including minor salivary glands.</p>	3
24.	Tumors of the Oral cavity	<p>General considerations, surgical principles</p> <p>Non odontogenic benign tumours occurring in oral cavity - fibroma, papilloma, lipoma, ossifying fibroma, myxoma etc.</p> <p>Odontogenic tumors: both benign and malignant.</p> <p>Ameloblastoma - Clinical features, radiological appearance and methods of management.</p> <p>Osteogenic tumours of the faciomaxiliary region.</p>	4
25.	Disorders of T.M. Joint	<p>Applied surgical anatomy of the joint.</p> <p>Development of the TMJ</p> <p>Surgical approaches to TM.J</p> <p>Radiological investigations</p> <p>Hypermobilty of TMJ; Dislocation - Types, aetiology, clinical features and management.</p> <p>Hypomobility of TMJ; Classification, Ankylosis - Definition, aetiology, clinical features and management</p>	4

		Myo-facial pain dysfunction syndrome, etiology, clinical features, management- Non surgical and surgical. Internal derangement of the joint. Inflammatory Diseases of T.M. Joint. Arthroscopy	
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d) CLINICAL AND ACADEMIC REQUIREMENTS

- i. Case Taking: Detailed clinical examinations, investigations and diagnosis – 10 nos.
- ii. Dental extractions under local anesthesia – 180 nos.
- iii. Suturing of extraction wound -5 nos.
- iv. Incision and drainage – 3 nos.
- v. Arch bar wiring, eyelet wiring and intermaxillary fixation on plaster or acrylic models- 1 each
- vi. IV/ IM injection technique on patients- 5 nos. each
- vii. Wound dressing – 5 nos.
- viii. Observing minor surgery done by staff member- 5 nos.
- ix. Surgical Assistance of minor surgeries- 5 nos.
- x. Observation of major surgeries in Operation Theatre- 3 nos.
- xi. Observation of surgical procedures performed in casualty– 5 nos.
- xii. Training in handling medical emergencies. CPR and basic life support
- xiii. Seminars: 6 nos. Two in the third year, Two in the fourth year and Two in the final year

A work record should be maintained by all students detailing each of the clinical and academic requirements duly signed by the teacher in charge and should be submitted at the time of examination after due certification from the head of the department.

e) CLINICAL REQUIREMENTS YEAR WISE SPILT UP:

Sl. No.	Topic	Procedures in III Year	Quota: Must do
1	Case Taking	Detailed clinical examinations, investigations and diagnosis	2 cases
2	Dental Extraction	Extraction of anterior and mobile teeth under LA : Infiltration only	30 cases
3	Seminars	Seminars on basic subjects, local anesthesia, investigative procedures,	2 no.

		exodontia etc	
	Injection	IV/ IM injection technique on patients-	5nos.each
4	Observation	Observing minor surgery under LA done by staff member	2 cases
Procedures in Final year (Part I)			
1	Case Taking	Detailed clinical examinations, investigations and diagnosis	3 cases
2	Dental Extraction	Extraction of anterior and posterior teeth under LA : Infiltration and blocks	90 cases
3	Suturing	Suturing of extraction wound	5 no.
4	Seminars	Seminars on oral surgery subjects, cross contamination and infection, impactions, medically compromised patients, medical emergencies etc.	2 no.
5	Observation	Observing minor surgery under LA done by staff member	3 cases
6	Assistance	Assistance of minor surgery under LA done by staff member	2 cases
7	Observation	Observation of cases managed in the casualty	2 cases
8	Skill development	Wiring procedures in models	3 nos.
Procedures in Final year (Part II)			
1	Case Taking	Detailed clinical examinations, investigations and diagnosis	5 cases
2	Dental Extraction	Extraction of anterior and posterior teeth under LA : Infiltration and blocks	60cases
3	Seminars	Seminars on oral surgery subjects like TMJ, Tumors, Maxillofacial injuries, Infections, Salivary Gland diseases and Medico-legal considerations	2 no.
4	Observation	Observation of major surgery under GA do in the OT	3 cases
5	Assistance	Assistance of minor surgery under LA done	3cases

		by staff member	
6	Procedure	Incision and drainage	3
7	Procedure	Wound dressing	5
8	Observation	Observation of cases managed in the casualty	3 cases



f) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
One Question from Local Anaesthesia One Question from Oral Surgery	Structured Essays 2x 10marks	20
Two Questions from Oral Surgery, One Question from Local Anaesthesia, , One Question from General Anaesthesia	Short Notes 4 x 5marks	20
Questions from any of the Oral & Maxillofacial Surgery topics.(at least one question from management of medical emergencies) One question from Death Certification & legal aspects of Forensic medicine.	Brief Notes 10x3marks	30
	Total	70

xi. Theory

University Written	70Marks
Viva Voce	20Marks
Internal Assessment	10 Marks

xii. Clinical:

University Clinical Examination: 80 Marks

Extraction of one firm tooth (Maxillary/ Mandibular)

Case History	20 Marks
Local Anaesthesia technique	25 Marks
Extraction of firm tooth & patient management	25 Marks
Clinical Work Record & Seminar	10 Marks

Internal Assessment: 20 Marks

Grand Total 200Marks

20. CONSERVATIVE DENTISTRY AND ENDODONTICS

a) OBJECTIVES:

i. Knowledge and Under Standing:

The graduate should acquire the following knowledge during the period of training,

- (1) To diagnose and treat simple restorative work for teeth.
- (2) To gain knowledge about aesthetic restorative material and to translate the same to patients needs.
- (3) To gain the knowledge about endodontic treatment on the basis of scientific foundation.
- (4) To carry out simple endodontic treatment.
- (5) To carry out simple luxation of tooth and its treatment and to provide emergency endodontic treatment.

ii. Skills:

He should attain following skills necessary for practice of dentistry

- (1) To use medium and high speed hand pieces to carry out restorative work.
- (2) Poses the skills to use and familiarize endodontic instruments and materials needed for carrying out simple endodontic treatment.
- (3) To achieve the skills to translate patients esthetic needs along with function.

iii. Attitudes:

- (1) Maintain a high standard of professional ethics & conduct and apply these in all aspects of professional life.
- (2) Willingness to participate in CDE programme to update the knowledge and professional skill from time to time.
- (3) To help and participate in the implementation of the national oral health policy.
- (4) He should be able to motivate the patient for proper dental treatment and maintenance of oral hygiene should be emphasise which will help to maintain the restorative work and prevent future damage.

b) THEORY: 160 HOURS (II yr.25hrs, III Yr. 65 hrs, Final Yr. Part I. 40 hrs. Part II. 30hrs.)

Sl.No.	Topic for II Year	Hours
1.	Introduction to Conservative Dentistry.	1
2.	Definition, Aim & Scope of Conservative Dentistry & Endodontics	
3.	Nomenclature of dentition; Tooth Numbering systems	1
4.	Restoration - Definition & Objectives	

5.	Hand Instruments - Classification, Nomenclature, Design, Formula of hand cutting instruments, Grasps and Rests, Sterilization.	2
6.	Rotary Cutting instruments - Burs, Design, Types. Various speeds in tooth preparation. Hazards with cutting instruments.	2
7.	Dental caries – Aetiology, classification, caries terminology	1
8.	Fundamentals in Tooth preparation	4
9.	Definition, Stages and steps , Classification of Tooth preparations, Nomenclature, Concepts in tooth preparations for Silver Amalgam, Cast gold inlay, Composite resins and Glass Ionomer	
10.	Tooth preparation for amalgam restorations. Stepwise procedure for Class I, II, III, IV, V amalgam restorations. Failure of amalgam restoration.	6
11.	Contact and contour of teeth – different methods of tooth separation	1
12.	Matrices, Retainers, Wedges – methods of wedging	1
13.	Finishing & polishing of restorations.	1
14.	Chair side positions – patient and operator positions	1
15.	Management of deep carious lesions – Technique of caries excavation with hand and rotary instruments, Affected and Infected dentin, Caries detector dyes, Concept of Remaining Dentin Thickness, Pulp capping and Pulpotomy.	2
16.	Access cavity and brief introduction of root canal instruments	2
Topic for III Year		
17.	Nomenclature of Dentition Tooth numbering systems: ADA, Zsigmondy- Palmer, and FDI systems	2
Gnathological concepts of Restoration		
18.	Physiology of occlusion, normal occlusion, ideal occlusion mandibular movements and occlusal analysis. Occlusal rehabilitation and restoration.	3
Dental Caries		
19.	Aetiology, classification clinical features, morphological features, microscopic features, clinical diagnosis and sequel of dental caries. Caries treatment.	6
Treatment Planning For Restorative Procedure:		
20.	Patient assessment, clinical examination, radiographic examination, tooth vitality tests, diagnosis and treatment planning, preparation of the case sheet. Patient and operator position.	3
Preventive measures in restorative practice		
21.	Plaque control, Pit and Fissure sealants, Fluorides, Dietary measures, restorative	4

	procedures and periodontal health.	
22.	<p>Armamentarium for Tooth Preparation:</p> <p>General classification of operative instruments.</p> <p>a) Hand cutting instruments</p> <p>Terminology and classification</p> <p>Design, formula and sharpening of instruments.</p> <p>Grasp Rest and application.</p> <p>b) Rotary cutting instruments</p> <p>Dental bur , mechanism of cutting</p> <p>Common design characteristics</p> <p>Diamond and other abrasive instruments</p> <p>Cutting mechanism</p> <p>Hazards and precautions</p> <p>Sterilization and maintenance of instruments. Basic</p> <p>Instrument tray set up.</p>	6
23.	<p>Isolation of Operating Filed:</p> <p>Control of moisture ,purpose and methods of isolation, rubber dam isolation in detail, antisialogogues</p>	3
24.	<p>Infection Control</p> <p>Routes of transmission of dental infection</p> <p>Personal barrier protection</p> <p>Control of infection from aerosol, spatter</p> <p>Sterilization procedures for dental equipment and instruments, monitoring sterilization, disinfection of operatory</p> <p>Dental water line contamination and Biofilm</p> <p>Disposal of waste</p>	4
25.	<p>Pulp Protection</p> <p>Liners, Varnishes, Bases.</p> <p>Affected and infected dentin, Caries detector dyes</p> <p>Concepts of Remaining Dentin Thickness</p>	3
26.	Pain control in restorative procedures	3
27.	<p>Amalgam Restoration:</p> <p>Indication, contraindication.</p> <p>Physical and mechanical properties</p>	7

	<p>Clinical behavior. Advantages and disadvantages.</p> <p>Tooth preparation for Class I , II, V and III.</p> <p>Step wise procedure for tooth preparation and restoration including modified designs.</p> <p>Bonded amalgam,</p> <p>Failure and repair of amalgam restorations</p>	
28.	<p>Contacts and contour</p> <p>Tooth separation</p> <p>Matrices, retainers and wedges, methods of wedging</p>	1
29.	<p>Management Of Deep Carious Lesions</p> <p>Technique of caries excavation – Hand and rotary</p> <p>Indirect and Direct Pulp Capping, Pulpotomy</p>	1
30.	<p>Dentinal Hypersensitivity</p> <p>Theories of hypersensitivity</p> <p>Management</p>	1
31.	<p>Complex amalgam restorations</p> <p>Pin Amalgam Restoration</p> <p>Indications, Contra Indication, Advantages, Disadvantages of pin amalgams, types of pins, methods of placement, alternative means for providing retention for complex amalgam restorations. Failure of pin amalgam restoration</p>	4
32.	<p>Gingival Tissue Management</p> <p>Indication and methods, including recent techniques for gingival retraction.</p>	2
33.	<p>Adhesion to tooth structure</p> <p>Definition and mechanism</p> <p>Enamel and Dentin bonding</p> <p>Classification and recent development in dentin bonding systems components of dentin bonding agents critical steps in dentin bonding.</p>	3
34.	<p>Anterior Restorations</p> <p>Selection of cases, selection of material, shade selection, Clinical technique for anterior composite restorations.</p>	2
35.	<p>Composite Restorations</p> <p>Composition, classification, properties</p> <p>Recent advances in composite resins</p> <p>Indications, contraindications, advantages, disadvantages</p>	4

	Step wise procedures of tooth preparation for composite restorations. Finishing and polishing of composite restoration	
36.	Minimal Invasive Dentistry Principles of MID, caries risk assessment, materials and techniques	2
37.	Alternate methods of tooth preparation for restorations Air abrasion, chemo mechanical method, lasers	1
	Topic for Final year (Part I) Endodontics	
38.	Introduction, definition, scope and future of Endodontics	1
39.	Rationale and principles of Endodontics Case selection, indication and contraindications for root canal treatments	2
40.	Clinical diagnostic methods Case history, diagnosis and treatment plan Clinical diagnostic methods Case history, diagnosis, pulp vitality assessment, recent advances and treatment plan	3
41.	Microbiology of endodontic infection	2
42.	Isolation and infection control in Endodontics Rubber dam application	1
43.	Endodontic instruments Hand instruments Power driven instruments Standardization Principles of using endodontic instruments Sterilization	3
44.	Pulpal diseases Classification, etiology, diagnosis, management	2
45.	Periapical diseases: Classification, etiology, diagnosis, management	2
46.	Vital pulp therapy: Indirect and direct pulp capping Pulpotomy - types and medicaments used Apexogenesis and apexification –multivisit and single visit apical barrier techniques, revascularization ,regenerative endodontics	3

47.	Esthetics in dentistry Introduction and scope Facial proportions, Golden proportions Anatomy and physiology of smile Role of colour and translucency Esthetic recontouring Alteration of tooth form, shape, size and colour Management of discoloured teeth	4
48.	Composite restorations Recent advances in posterior composite resins Indications, contraindications, advantages and disadvantages Stepwise procedure of tooth preparation for composite restoration. Clinical technique for posterior direct composite restorations Finishing and polishing of composite restoration Indirect posterior composite restoration	4
49.	Casts restorations Indications, contraindications, advantage and disadvantages Materials used Class II cavity preparation for inlays Types of bevels in cast restoration Fabrication of wax patterns Differences in tooth preparation for amalgam and cast restorations	3
50.	Casting Die materials and preparation of dies Refractory materials Alloys used for casting Casting machines Casting procedure Casting defects Cementation of restoration	2
51.	Temporisation or interim restoration Materials and procedure	1
52.	Root Caries Etiology, clinical features and management	1

53.	Non carious destruction of tooth structure Definition, etiology, diagnosis, clinical features and management	2
54.	Ceramic Restorations Recent advances in ceramic materials & techniques including CAD/CAM (in brief) Ceramic laminates, inlays, onlays and crowns, Indications, contraindications, advantages, disadvantages and techniques (in brief)	3
55.	Direct Filling gold Restorations Introduction Types of direct filling gold Indications, contraindications, advantages, disadvantages tooth preparation and restoration	1
Final year (Part II)		
Endodontics		
56.	Emergency endodontic procedures	2
57.	Anatomy of pulp space Root canal anatomy of maxillary and Mandibular teeth. Classification of canal configuration and variations in pulp space.	2
58.	Access preparation Objectives Principles Instruments used Sequential steps of access preparation for individual tooth	2
	Preparation of root canal space a. Determination of working length definition and methods of determining working length	1
59.	Cleaning and shaping of root canals Objectives Principles Instruments used Techniques – hand and rotary Step back & Crown down methods	2

60.	Disinfection of root canal space a. Irrigants Functions Requirements Types Methods and techniques of irrigation	1
	b. Intracanal medicaments Functions Requirements Types Method of placement and limitations	1
61.	Problems during cleaning and shaping of root canal spaces Perforation and its management Broken instruments and its management Management of curved root canals	2
62.	Obturation of the root canal system a. Materials- Ideal root canal filling material, classification of materials b. Obturation techniques Classification and procedure	2
63.	Root canal sealers Ideal properties Classification, functions Manipulation and application of root canal sealers	2
64.	Post endodontic restoration Principles of post endodontic restorations Post and core-materials and procedure(in brief)	2
65.	Smear layer and its importance in endodontics and conservative treatment	1
66.	Discoloured teeth and its management Classification, etiology Bleaching agents , Vital and non vital bleaching methods	1
67.	Traumatized teeth Diagnosis, Classification ,management of of luxated ,avulsed teeth .root fracture,	2

	vertical fracture	
68.	Endodontic surgeries Indication contraindications, pre operative preparation Surgical instruments and techniques Apicoectomy, retrograde filling Post operative sequale Trephination, hemisection Radisectomy Reimplantation (both intentional and accidental)	3
69.	Endo-perio lesions Portals of communication Etiology ,clinical features, diagnosis, classification and management	
70.	Root resorption Etiology and management	1
71.	Success and failures of endodontic treatments	1
72.	Retreatment in Endodontics	1
73.	Specialized equipments-lasers, magnification loupes, dental operating microscopes(DOM) in conservative dentistry and endodontics	1

c) Minimum requirement to appear for Final BDS Part II Conservative Dentistry and Endodontics University Examination:

Sl.No	Clinical Procedure	No.
1	Case history recording, diagnosis and treatment planning	10
2	Management of deep caries lesions	5
3.	Glass ionomer restorations	20
4.	Composite restorations in anterior teeth	5
5.	Class I amalgam restorations	30
6.	Class II amalgam restorations	20
7.	Root canal treatment of anterior teeth	5

d) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
One Question from Conservative Topics One Question from Endodontic Topics	Structured Essays 2x 10marks	20
Two Questions from Conservative Topics including esthetics and Two Questions from Endodontic Topics	Short Notes 4 x 5marks	20
Questions from any of the Conservative & Endodontic topics.	Brief Notes 10x3marks	30
	Total	70

xiii. Theory

University Written	70Marks
Viva Voce	20 Marks
Internal Assessment	10 Marks

xiv. Clinical:

University Clinical Examination:	80 Marks
Internal Assessment:	20 Marks

Grand Total 200 Marks

Details of Mark distribution for university Practical examination:

Clinical Exercise: 70 marks

Work Record : 10 marks

Clinical Exercises

1. Preparation for class II amalgam and restoration

Or

2. Anterior composite restoration

Or

3. Root canal treatment for anterior tooth up to selection of master cone

Mark distribution for the clinical examinations

1. Class II amalgam restoration

- i) Case history recording, examination,
diagnosis and treatment planning : 15 min 10 marks
- ii) Tooth preparation : 45 min 20 marks
- iii) Base and matrix : 15 min 15 marks
- iv) Restoration and carving : 30 min 25 marks

Total : 70 marks

2. Anterior composite restoration

- i) Case history recording, examination,
diagnosis and treatment planning : 15 min 10 marks
- ii) Tooth preparation : 30 min 25 mark
- iii) Lining and matrix : 15 min 10 marks
- iv) Restoration and finishing : 45 min 25 marks

Total : 70 marks

3. Anterior RCT

- i) Case history recording, examination,
Diagnosis and treatment planning : 15 min 10 marks
- ii) Access preparation : 30 min 25 marks
- iii) Working length : 15 min 10 marks
- iv) Cleaning and shaping,
Master cone selection : 45 min 25 marks

Total : 70 marks

21. PROSTHODONTICS AND CROWN & BRIDGE

a) **THEORY:160 HOURS (Ilyr. 25 hrs, IIlyr.65 hrs, Part I.40 hrs, Part II. 30 hrs)**

Sl. No.	Topic	Description	Hours
Removable Complete Prosthodontics			
1.	Applied Anatomy and Physiology	Introduction Biomechanics of the edentulous state. Residual ridge resorption	3
2.	Communicating with the patient	Understanding the patients, mental attitude. Instructing the patient.	1
3.	Diagnosis and treatment planning for patient.	With some teeth remaining. With no teeth remaining. Systemic status. Local factor. The geriatric patient Diagnostic procedures.	2
4.	Articulators – discussion		3
5.	Improving the patient's denture foundation and ridge relation- an overview	Pre-operative examination. Initial hard tissue & soft tissue procedure, Secondary hard & soft tissue procedure Implant procedure. Congenital deformities Postoperative procedure	3
6.	Principles of Retention, Support and Stability		2
7.	Impressions- detail.	Muscles of facial expression. Biologic considerations for maxillary and Mandibular impression including anatomy landmarks and their	7

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		<p>interpretation.</p> <p>Impression objectives</p> <p>Impression Materials</p> <p>Impression techniques.</p> <p>Maxillary and Mandibular impression procedures</p> <p>Preliminary impressions</p> <p>Final impressions.</p> <p>Laboratory procedures involved with impression making (Beading & Boxing, and cast preparation).</p>	
8.	Record bases and occlusion rims- in details.	<p>Materials & techniques</p> <p>Useful guidelines and ideal parameters.</p>	2
9.	Recording and transferring bases and occlusal rims		1
10	Biological consideration in jaw relation& jaw movements – craniomandibular relations.	<p>Mandibular movements.</p> <p>Maxillo- Mandibular relation including vertical and horizontal jaw relations.</p>	3
11	Concepts of occlusion- discuss in brief.	Discuss in brief.	2
12.	Relating the patient to the articulator	<p>Face bow types & uses – discuss in brief.</p> <p>Face bow transfer procedure- discuss in brief.</p>	1
13.	Recording Maxillo Mandibular relation.	<p>Vertical relation</p> <p>Centric relation records.</p> <p>Eccentric relation records.</p> <p>Lateral relation records</p>	4
14.	Tooth selection and arrangement.	<p>Anterior teeth.</p> <p>Posterior teeth.</p> <p>Esthetic and functional</p>	2

		harmony.	
15.	Relating inclination of teeth to concept of occlusion- in brief.	Neurocentric concept. Balanced occlusal concept.	2
16.	Trial dentures		3
17.	Laboratory procedures	Wax contouring. Investing of dentures. Preparing of mold. Preparing & packing acrylic resin. Processing of dentures. Recovery of dentures. Lab remount procedures Recovering the complete denture from the cast. Finishing and polishing the complete denture. Plaster cast for clinical denture remount procedure	3
18.	Denture insertion	Insertion procedures. Clinical errors. Correcting occlusal disharmony. Selective grinding procedures	3
19.	Treating problems with associated denture use	Discuss in brief (tabulation/ flow chart form).	1
20	Treating abused tissues	Discuss in brief	1
21	Relining and rebasing of dentures	Discuss in brief	2
22	Immediate complete dentures construction procedure	Discuss in brief	2
23	The single complete dentures	Discuss in brief	2
24	Overdentures	Discuss in brief	2
25	Implant Supported complete denture	Discuss in brief	3
26	Reduction of residual ridge	Discuss in brief	1
Removable Partial Prosthodontics			

1.	Introduction		1
2	Terminologies and scope		1
3	Classification		2
4	Examination, Diagnosis & Treatment planning & evaluation of diagnostic data.		2
5	Components of a removable partial denture.	Major connectors Minor connectors Rest and rest seats Direct retainers Indirect retainers Tooth replacement.	12
6.	Principles of Removable Partial Denture Design		3
7	Survey and design – in brief		1
8	Surveyors		1
9	Surveying		1
10	Designing		3
11	Mouth preparation and master cast		1
12	Impression materials and procedures for removable partial dentures		2
13	Preliminary jaw relation and esthetic try in for some anterior replacement teeth		2
14	Laboratory procedures for framework construction- in brief		1
15	Fitting the framework- in brief		1
16	Try in of the partial denture- in brief		1
17	Completion of the partial denture- in brief		1
18	Inserting the Removable partial denture in brief		1
19	Post insertion observations		1
20	Temporary Acrylic Partial Dentures		1
21	Immediate Removable Partial Denture		1
22	Removable partial Dentures opposing Complete denture.		1
Fixed Partial Prosthodontics			
1.	Introduction		1

2	Fundamentals of occlusion in brief.		1
3	Articulators	In brief.	1
4	Treatment planning for single tooth restoration.		1
5	Treatment planning for the replacement of missing teeth including selection and choice of abutment teeth.		2
6.	Fixed partial denture configurations		1
7	Principles of tooth preparations.		2
8	Preparations for full veneer crowns		3
9	Preparations for partial veneer crowns	In brief.	1
10	Provisional Restorations		1
11	Fluid Control and Soft Tissue Management		1
12	Impressions		1
13	Working Casts and Dies		1
14	Wax patterns		1
15	Pontics and Edentulous Ridges		1
16	Esthetic Considerations		1
17	Finishing and Cementation		1
18	Implant Supported Fixed Restorations		2
Miscellaneous Topics to Be Covered In Brief :			
1	Solder Joints and Other Connectors		35
2	All - Ceramic Restorations		
3	Metal - Ceramic Restorations		
4	Preparations of intracoronal restorations.		
5	Preparations for extensively damaged teeth.		
6	Preparations for Periodontally weakened teeth		
7	The Functionally Generated Path Technique		
8	Investing and Casting		
9	Resin - Bonded Fixed Partial Denture		
10	Digital impressions		
11	3D printing in Prosthodontics		
12	CAD-CAM in Prosthodontics		

It is

suggested that the above mentioned topics be dealt with wherever appropriate in the following order so as to cover -

Definition

Diagnosis (of the particular situation /patient selection /treatment planning)

Types / Classification

Materials

Methodology - Lab /Clinical

Advantages & disadvantages

Indications, contraindications

Maintenance Phase

Recent advances

Failure

b) Mandatory requirement to appear for Final BDS part II Prosthodontics University

Examination:

- 1. Treating completely edentulous conditions with Complete Denture – Minimum 5 nos. (including all clinical and laboratory procedures)*
- 2. Treating partially edentulous conditions with Removable Partial Denture – Minimum 5 nos. (including all clinical and laboratory steps)*
- 3. Should have satisfactorily completed all the Preclinical Prosthodontic exercises*
- 4. Minimum of one seminar presentation on any Prosthodontic topic. A hard copy of the seminar to be submitted at the time of University examination.*

c) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
One Question From Complete Denture topics and one from either FPD or RPD	Structured Essays 2x 10marks	20
Two Questions from Complete denture, One question from RPD, One question from FPD.	Short Notes 4 x 5marks	20
Questions from any of the Prosthodontic topics including implants, maxillofacial prosthesis & applied Dental materials	Brief Notes 10x3marks	30
	Total	70

xv. Theory

University Written	70 Marks
Viva Voce	20 Marks
Internal Assessment	10 Marks

xvi. Clinical:

University Clinical Examination:	80 Marks
Case History	5 Marks
Complete Denture clinical steps	45 Marks
Tooth Preparation on Typhodont	20 Marks
Clinical Work Record & Seminar	10Marks
Internal Assessment:	20 Marks

Grand Total 200Marks

22. PAEDIATRIC AND PREVENTIVE DENTISTRY

a) **THEORY: 65 HOURS (III yr. 15 hrs. Final Yr. Part I. 20hrs Part II. 30 hrs.)**

Theory topics for III Year		
Sl. No.	Topic	Hours
	Introduction to Paediatric and Preventive Dentistry Definition, Scope, Objectives and Importance	1
1.	Dental Anatomy and Histology <ul style="list-style-type: none"> ◆ Chronology of Eruption of teeth ◆ Differences between primary and permanent teeth ◆ Eruption disorders and their management including teething, ectopic eruption, ankylosis etc. ◆ Importance of first permanent molar 	1
2.	Growth and Development (will be covered by Department of Orthodontics also) <ul style="list-style-type: none"> ◆ Importance of study of growth and development in Pedodontics ◆ Prenatal and postnatal factors in growth and development ◆ Theories of growth and development ◆ Methods to measure growth ◆ Development of maxilla and mandible and age related changes 	2
3.	Development of occlusion from birth to adolescence <ul style="list-style-type: none"> ◆ Mouth of neonate, gumpads ◆ Primary Dentition period ◆ Mixed dentition period ◆ Establishment of occlusion ◆ Study of variation and abnormalities 	2
4.	Case history recording <ul style="list-style-type: none"> ◆ Principles of history taking, examination, investigations, ◆ diagnosis and treatment planning 	1
5.	Child Psychology <ul style="list-style-type: none"> ◆ Definition ◆ Importance of understanding Child Psychology in Pedodontics ◆ Theories ◆ Psychological development from birth through adolescence 	4

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	<ul style="list-style-type: none"> ◆ Dental fear, anxiety and their management, types of cry ◆ Application of Psychology principles in management of child patients in the dental office ◆ Psychological disorders including anorexia, bulimia ◆ Child abuse and neglect 	
6.	<p>Behaviour management</p> <ul style="list-style-type: none"> ◆ Definition ◆ Classification and types of behaviour ◆ Factors influencing child behaviour ◆ Non- Pharmacologic management of behaviour ◆ Pharmacologic management of behaviour- ◆ Conscious sedation including nitrous oxide- oxygen inhalational anaesthesia ◆ Pharmacological principles in Paediatric Dentistry- drug dosage formulae ◆ Analgesics, anti-inflammatory and antibiotics commonly prescribed for children 	4
Theory topics for Final Year Part I		
7.	<p>Dental Caries</p> <ul style="list-style-type: none"> ◆ Diagnostic procedures and caries detection ◆ Caries pattern in primary, young permanent and permanent teeth ◆ Early childhood Caries, rampant caries- definition, classification, etiology, pathogenesis, clinical features, complications and management ◆ Role of diet and nutrition in dental caries and sugar substitutes ◆ Diet counselling and diet modifications ◆ Caries activity tests , caries prediction, susceptibility and their clinical application 	3
8.	Dental Radiology as related to Pedodontics	1
1.	Dental materials used commonly in children and adolescents (Outline revision)	1
2.	<p>Paediatric Operative Dentistry</p> <ul style="list-style-type: none"> ◆ Principles of Operative Dentistry ◆ Isolation- Importance and techniques 	5

	<ul style="list-style-type: none"> ◆ Young Permanent Teeth and clinical considerations ◆ Modifications in cavity preparation and recent cavity designs for primary and young permanent teeth ◆ Atraumatic / Alternative Restorative Technique (ART) ◆ Other methods of caries removal ◆ Restoration of carious teeth (Primary, young permanent and permanent teeth) using various restorative materials like glass ionomers, composites, silver amalgam ◆ Preformed crowns: Stainless steel, polycarbonate and strip crowns 	
3.	<p>Gingival and Periodontal diseases in children</p> <ul style="list-style-type: none"> ◆ Normal gingival and periodontium in children ◆ Definition, classification ◆ Etiology, Pathogenesis and management of gingival and periodontal condition seen in children and adolescents 	2
4.	<p>Flourides</p> <ul style="list-style-type: none"> ◆ Historical background ◆ Systemic fluorides: Availability, agents, concentrations, advantages and disadvantages ◆ Topical fluorides: agents, composition, method of application both for professional and home use, advantages and disadvantages ◆ Mechanism of action and its anticariogenic effect ◆ Fluoride toxicity and its management ◆ Defluoridation techniques 	4
5.	<p>Paediatric Endodontics</p> <ul style="list-style-type: none"> ◆ Principles and diagnosis ◆ Classification of pulp pathology ◆ Management of pulpaly involved primary, young permanent and permanent teeth including materials used and techniques followed: ◆ Pulp capping ◆ Pulpotomy ◆ Pulpectomy ◆ Apexogenesis ◆ Apexification 	4
Theory topics for Final Year Part II		

6.	<p>Traumatic injuries to teeth</p> <ul style="list-style-type: none"> ◆ Definition, classification ◆ Etiology and incidence ◆ Management of trauma to primary teeth ◆ Sequelae and reaction following trauma to primary teeth ◆ Management of trauma to young permanent teeth ◆ Prevention of trauma: mouth protectors 	5
7.	<p>Preventive Orthodontics</p> <ul style="list-style-type: none"> ◆ Importance and functions of deciduous dentition ◆ Effects of premature loss of primary teeth <p>Preventive Orthodontics:</p> <ul style="list-style-type: none"> ◆ Definition ◆ Preventive measures ◆ Space loss ◆ Space maintenance and space management ◆ Space maintainers: definition, classification, indications and contra indications, advantages and disadvantages including construction of fixed space maintainers ◆ Space regainers ◆ Mixed dentition analysis ◆ Serial extraction 	5
8.	<p>Interceptive Orthodontics</p> <ul style="list-style-type: none"> ◆ Oral Habits in children ◆ Definition, classification and etiology of all habits ◆ Clinical features of deleterious oral habits including non- nutritive sucking, mouth breathing, non functional grinding, masochistic and occupational habits ◆ Management of oral habits in children ◆ Other problems seen during primary and mixed dentition period and their management 	4
9.	<p>Dental management of children with special needs</p> <ul style="list-style-type: none"> ◆ Definition, classification, etiology, clinical features, special considerations in the dental management of : 	5

	<ul style="list-style-type: none"> ◆ Physically handicapping conditions ◆ Mentally handicapping conditions ◆ Medically compromising conditions ◆ Genetic disorders and importance of genetic counseling including cleft lip and palate and its management 	
10.	<p>Oral surgical procedures in children</p> <ul style="list-style-type: none"> ◆ Indications and contra indications for extraction ◆ Minor surgical procedures in children ◆ Knowledge of local and general anaesthesia 	2
11.	<p>Preventive Dentistry</p> <ul style="list-style-type: none"> ◆ Definition, principles and scope ◆ Levels and types of prevention ◆ Infant oral health care and first dental visit <p>Preventive measures:</p> <ul style="list-style-type: none"> ◆ Minimal intervention ◆ Pit and fissure sealants ◆ Preventive resin restorations ◆ Newer agents available for caries prevention and demineralization ◆ Caries vaccine 	4
12.	Nanodentistry – Introduction, principles and technique – an outline	1
13.	Dental Health Education and school dental health programmes	1
14.	Importance of Dental HOME and anticipatory guidance	1
15.	Dental emergencies in children and their management	1
16.	Setting up of paediatric dental practice including ethics	1

b) PRACTICALS/ CLINICALS

Student is trained to arrive at proper diagnosis by following a scientific and systematic procedure of history taking and examination of orofacial region. Training is also imparted in management whenever possible.

In view of the above each student shall maintain a record of work done, which shall be evaluated for marks at the time of university examination.

The following is the minimum prescribed clinical and academic requirement.

1. Case taking : 25 cases

Long case-

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Detailed history taking & clinical examination, formulating diagnosis and planning comprehensive treatment for the child -**3 nos.**

A very detailed history taking including diet chart recording, space analysis etc - **2nos.**

Short case-

History taking (briefly), clinical examination, formulating diagnosis and treatment planning-
20 nos.

1. Preventive measures

Oral prophylaxis after using disclosing agents - **25nos.**

Topical fluoride application - **25 nos.**

Pit and fissure sealant application – **2nos**

2. Permanent Restorations:- **45 nos.**

3. Removable orthodontic appliances

Space maintainers / Habit breakers / Hawley’s appliance - **10nos.**

4. Dental Extractions under LA

Extraction of deciduous and permanent teeth –**30nos.**

5. Special Dentistry

Treatment for children with special health care needs - **1 no.**

6. Assignments on the topics given below in the year wise split-up

7. Seminar

Presentation of seminars, preferably in power point, during the Final year Part II clinical posting in the department. Seminar certified by the HOD should be submitted in a book form along with the record at the time of University Practical Examination.-**1 no.**

Clinical requirement –Year wise split up

Sl. No	Topic	Procedures in III year	Minimum requirement
1.	Case taking	Long case- Detailed history taking & clinical examination, formulating diagnosis and planning comprehensive treatment for the child.	2
2.	Preventive measures	1. Oral prophylaxis after using disclosing	5

		agents 2. Topical fluoride application	5
3.	Permanent Restorations	Amalgam or glass ionomer cement	5
4.	Removable orthodontic appliance	Space maintainer /Habit breaker/Hawley's appliance	1
5.	Dental Extractions	Extraction of mobile deciduous teeth	5
6.	Assignments	Assignments on Milestones of development, Immunisation schedule, Chronology of human dentition & Stages of tooth development, Tooth numbering systems, Eruption sequence, Early and Delayed eruption, Sterilization in dental office, Amalgam-types, composition and setting reaction, GIC- types, composition and setting reaction, Post operative instructions for various clinical procedures- after extractions, restorative work and orthodontic appliance insertion (It should be written in the clinical record and submitted before the end of III year posting in the department)	
7.	A study model/chart/poster		1
Procedures in Final year (Part I)			
1.	Case taking	Long case- All patient records- clinical & investigative records- like study models, pre-treatment and post- treatment photographs, prints of the radiographs etc Short case- History taking(briefly), clinical examination, formulating diagnosis and treatment planning	1 10
2.	Preventive measures	Oral prophylaxis	15

		Topical fluoride application	15
3.	Permanent Restorations	Amalgam/GIC	20
4.	Dental Extractions	Extraction of anterior or posterior deciduous teeth under LA	15
5.	Removable orthodontic appliance	Space maintainers/ habit breakers/Hawley's appliance	5
6.	Assignments	Assignments on Dental age and Assessment methods, Topical fluorides, Pulp vitality tests	
Procedures in Final Year (Part II)			
1	Case taking	A very detailed history taking including diet chart recording, space analysis etc Short case -	2 10
2	Preventive measures	Oral prophylaxis Topical fluoride application	5 5
3	Permanent Restorations	Amalgam/GIC	20
4	Removable orthodontic appliances	Space maintainer/Habit breakers/Hawley's appliance	4
5	Dental Extractions	Extraction of teeth including permanent posterior teeth, root stumps, grossly decayed deciduous teeth- under LA	10
6	Treatment for children with special health care needs	Treatment for children with cardiac problem/bleeding disorders/neurological problems/ mentally challenged/visual/hearing impairment etc	1
7	Seminar	Seminar on allotted topic should be presented with power point and the print and soft copies should be submitted to the Head of the department before the end of Part II posting.	1

c) SCHEME OF EXAMINATION

Distribution of Topics and Types of Questions for University Written Examination:

Contents	Types of Questions and Distribution of Marks	Total Marks
Questions from any of the Paediatric & Preventive Dentistry Topics	Structured Essays 2x 10marks	20
	Short Notes 4 x 5marks	20
	Brief Notes 10x3marks	30
	Total	70

xvii. Theory

University Written	70 Marks
Viva Voce	20 Marks
Internal Assessment	10 Marks

xviii. Clinical:

University Clinical Examination:	80 Marks
Case History, Clinical Examination, Diagnosis & Treatment Planning	40 Marks
Clinical Procedure:	
Oral prophylaxis and topical fluoride application/ Restoration of decayed tooth/ Extraction of tooth	20 Marks
Chair side preparation & Measures taken for infection control	5 Marks
Overall management of the child patient & Post operative instructions	5 Marks
Clinical Work Record + Seminar + Chart/Poster/Study model	5+3+2=10 Marks
Internal Assessment:	20 Marks

Grand Total 200Marks

2.7 Total number of Hours (split up)

Subjects	Lecture (hrs)	Practical (hrs)	Clinical (hrs)	Total (hrs)
General Human Anatomy including Embryology and Histology	100	175		275
General Human Physiology	120	60		180
Biochemistry, Nutrition and Dietetics	70	60		130
Dental Anatomy, Embryology and Oral histology	105	250		355
Dental Materials	80	240		320
General and Dental Pharmacology & Therapeutics	70	20		90
General Pathology	55	55		110
General Microbiology	65	50		115
General Medicine	60		90	150
General Surgery	60		90	150
Oral Pathology & Oral Microbiology	145	130		275
Oral Medicine & Radiology	75		200	275
Paediatric & Preventive Dentistry	65		320	385
Orthodontics & Dentofacial Orthopaedics	70	160	200	430
Periodontology	80		200	280
Oral & Maxillofacial Surgery	76		370	446
Conservative Dentistry & Endodontics	160	200	370	730
Prosthodontics and Crown & Bridge	160	340	370	870
Public Health Dentistry	74		200	274
Total	1660	1740	2410	5840

Note:

There should be a minimum of 240 teaching days every academic year consisting of at least 6 working hours a day excluding one hour of lunch break each day.

2.8 Branches if any with definition: Refer Course content

2.9 Teaching learning Methods

The BDS programme offers a spiral, vertically and horizontally integrated curriculum utilising a blend of teaching and learning methods, which combine clinical skills training with the acquisition of knowledge, skills and professional attributes at all levels of the programme. All teaching and learning activities are patient and student-centered, and are specifically designed for students to experience authentic and contextual learning. Refer Section 2.5 for detailed outline.

2.10 Content of each Subjects in each year

First Year

- a) General Human Anatomy including Embryology and Histology
- b) General Human Physiology and Biochemistry, Nutrition and Dietetics
- c) Dental Materials
- d) Dental Anatomy, Embryology and Oral Histology
- e) Preclinical Conservative Dentistry
- f) Preclinical Prosthodontics and Crown & Bridge

Second Year

- a) General Pathology and Microbiology
- b) General and Dental Pharmacology and Therapeutics
- c) Dental Materials
- d) Pre clinical Conservative Dentistry
- e) Preclinical Prosthodontics and Crown & Bridge
- f) Pre clinical Orthodontics
- g) Oral Pathology & Oral Microbiology

Third Year

- a) General Medicine
- b) General Surgery
- c) Oral Pathology and Oral Microbiology
- d) Conservative Dentistry and Endodontics
- e) Oral & Maxillofacial Surgery
- f) Oral Medicine and Radiology
- g) Orthodontics & Dentofacial Orthopaedics
- h) Paediatric & Preventive Dentistry
- i) Prosthodontics and Crown & Bridge

- j) Periodontology
- k) Public Health Dentistry

Final Year -Part I (One Year programme)

- a) Orthodontics & Dentofacial Orthopaedics
- b) Oral Medicine & Radiology
- c) Public Health Dentistry
- d) Periodontology
- e) Prosthodontics & Crown and Bridge
- f) Conservative Dentistry and Endodontics
- g) Oral & Maxillofacial Surgery
- h) Paediatric & Preventive Dentistry

Final Year- part II (Six months programme)

- a) Prosthodontics and Crown & Bridge
- b) Conservative Dentistry and Endodontics
- c) Oral & Maxillofacial Surgery
- d) Paediatric & Preventive Dentistry

Emphasis on Comprehensive Dental Care / Electives/ Research

For contents of each subject refer syllabus

सर्वे भयन्तु सुखिनः

2.11 No. of hours per subject

I BDS

Sl. No.	Subjects	Lecture (hrs)	Practical (hrs)	Clinical (hrs)	Total (hrs)
1.	General Human Anatomy including Embryology and Histology	100	175	—	275
2.	General Human Physiology	120	60	—	180
3.	Biochemistry, Nutrition and Dietetics	70	60	—	130
4.	Dental Anatomy, Embryology and Oral histology	105	250	—	355
5.	Dental Materials	20	40	—	60
6.	Pre clinical Prosthodontics and Crown & Bridge	—	100	—	100
7.	Pre clinical Conservative Dentistry	—	100	—	100
	Total	415	785	—	1200

II B.D.S.

Sl. No.	Subjects	Lecture (hrs)	Practical (hrs)	Clinical (hrs)	Total (hrs)
1.	General Pathology	55	55	—	110
2.	General Microbiology	65	50	—	115
3.	General and Dental Pharmacology & Therapeutics	70	20	—	90
4.	Dental Materials	60	200	—	260
5.	Pre clinical Prosthodontics and Crown & Bridge	25	200	—	225
6.	Pre clinical Conservative Dentistry	25	100	—	125
7.	Pre clinical Orthodontics	—	160	—	160
8.	Oral Pathology & Oral Microbiology	25	50	—	75
	Total	325	835	—	1160

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III B.D.S.

Sl. No.	Subjects	Lecture (hrs)	Practical (hrs)	Clinical (hrs)	Total (hrs)
1.	General Medicine	60	—	90	150
2.	General Surgery	60	—	90	150
3.	Oral Pathology and Oral Microbiology	120	80		200
4.	Oral Medicine and Radiology	25	—	60	85
5.	Public Health Dentistry	24	—	60	84
6.	Orthodontics & Dentofacial Orthopaedics	20	—	60	80
7.	Periodontology	30		60	90
8.	Oral & Maxillofacial Surgery	26	—	110	136
9.	Paediatric and Preventive Dentistry	15	—	60	75
10.	Conservative Dentistry and Endodontics	65	—	110	175
11.	Prosthodontics and Crown & Bridge	65	40	110	215
	Total	480	120	810	1440

Final B.D.S. Part I

Sl. No.	Subjects	Lecture (hrs)	Practical (hrs)	Clinical (hrs)	Total (hrs)
1.	Oral Medicine & Radiology	50	—	140	190
2.	Public Health Dentistry	50		140	190
3.	Orthodontics & Dentofacial Orthopaedics	50	—	140	190
4.	Periodontology	50	—	140	190
5.	Oral & Maxillofacial Surgery	20	—	140	160
6.	Paediatric and Preventive Dentistry	20	--	140	160
7.	Conservative Dentistry and Endodontics	40		140	180
8.	Prosthodontics and Crown & Bridge	40	—	140	180
	Total	320	—	1120	1440

Final B.D.S. Part II

Sl. No.	Subjects	Lecture (hrs)	Practical (hrs)	Clinical (hrs)	Total (hrs)
1.	Oral & Maxillofacial Surgery	30	—	120	150
2.	Conservative Dentistry and Endodontics	30	—	120	150
3.	Prosthodontics and Crown & Bridge	30	—	120	150
4.	Paediatric and Preventive Dentistry	30	—	120	150
	Total	120	—	480	600

Note:

There should be a minimum of 240 teaching days every academic year consisting of at least 6 working hours a day excluding one hour of lunch break each day.

Each institution should prepare a master time table a format of which is given in Annexure

Teaching schedule as per the syllabus and master time table is to be prepared in all the subjects of study by the concerned HoD's in consultation with the Principal of the institution.

2.12 Practical Training: Refer Syllabus

2.13 Records: Refer Section syllabus

2.14 Dissertation: Not Applicable.

2.15 Specialty training if any: Refer Syllabus

2.16 Project work to be done if any: Refer Syllabus

2.17 Any other requirements: Refer syllabus

2.18 Prescribed/Recommended textbooks for each subject

Subject: **General Human Anatomy including Embryology and Histology**

- 1) Clinical Anatomy for Medical Students, Snell (Richard S.), Little Brown & company, Boston.
- 2) Anatomy, R J Last's - McMinn,
- 3) Cunningham Manual of Practical Anatomy: Head & Neck & Brain.Vol.III, Romanes (G.J) Oxford Medical publication.
- 4) Functional Histology, Wheater, Burkitt & Daniels, Churchill Livingstone.
- 5) Medical Embryology, Sadler, Langman's,
- 6) Grant's Atlas of Anatomy, James E Anderson, Williams& Wilkins.
- 7) Gray's Anatomy, Williams, Churchill Livingstone.
- 8) Medical Genetics, Emery.
- 9) Essentials of Anatomy for Dentistry Students, D R Singh, Wolters Kluwer.

Subject: Physiology

- 1) Text book of Physiology, Guyton
- 2) Review of Medical Physiology, Ganong
- 3) Human physiology, Vander
- 4) Concise Medical Physiology, Choudhari
- 5) Human Physiology, Chaterjee
- 6) Human Physiology for BDS students, A.K. Jain

Reference books;

- 1) Physiology, Berne & Levey
- 2) Physiological basis of Medical Practice, West-Best & Taylor's

Experimental Physiology:

- 1) Practical Physiology, Rannade
- 2) A text book of practical physiology, Ghai
- 3) Clinical Methods, Hutchison's

Subject: Biochemistry

- 1) Textbook of Biochemistry for Dental Students, DM Vasudevan, Sreekumari S
- 2) Text book of Biochemistry-U Satyanarayana

Reference books;

- 1) Harper's Biochemistry, R.K.Murray et.al.
- 2) Text book of Biochemistry with clinical correlations T.N. Devlin
- 3) Basic and applied Dental Biochemistry, R.A.D. Williams & J.C.Elliot
- 4) Nutritional Biochemistry S. Ramakrishnan and S.V. Rao

Subject: Dental Anatomy, Embryology and Oral Histology

- 1) Orban's Oral Histology & Embryology - S.N.Bhaskar
- 2) Oral Development & Histology - James & Avery
- 3) Wheeler's Dental Anatomy, Physiology & Occlusion – Major M.Ash
- 4) Dental Anatomy - its relevance to dentistry - Woelfel & Scheid
- 5) Applied Physiology of the mouth – Lavelle
- 6) Physiology & Biochemistry of the mouth – Jenkins
- 7) Oral Histology- 'Development, Structure and Function- A. R. Tencate

Subject: General Pathology

- 1) Robbins - Pathologic Basis of Disease Cotran, Kumar, Robbins

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- 2) Anderson's Pathology Vol 1 & 2 Editors - Ivan Damjanov & James Linder
- 3) Wintrobe's clinical Haematology Lee, Bithell, Foerster, Athens, Lukens

Subject: Microbiology

- 1) Text book of Microbiology - R.Ananthanarayan & C.K.Jayaram Paniker.
- 2) Medical Microbiology - David Greenwood et al.
- 3) Textbook of Microbiology for Dental students- surinder Kumar

Reference books;

- 1) Microbiology - Prescott, et al.
- 2) Microbiology - Bernard D. Davis, et al.
- 3) Clinical & Pathogenic Microbiology - Barbara J Howard, et al.
- 4) Mechanisms of Microbial diseases - Moselio Schaechter, et al.
- 5) Immunology an Introduction – Tizard
- 6) Immunology - Evan Roitt, et al.

Subject: Dental Materials

- 1) Phillips Science of Dental Materials - Kenneth J. Anusavice
- 2) Restorative Dental Materials -Robert G.Craig
- 3) Notes on Dental Materials - E.C. Combe

Reference books:-

- 1) Introduction to Dental Materials, Van Noort,
- 2) Applied Dental Materials, McCabe,
- 3) Materials used in Dentistry- Mahalaxmi.S

Subject: General and Dental Pharmacology and Therapeutics

- 1) Basic and Clinical pharmacology, Bertam G. Katzung, Appleton & Lange
- 2) Clinical Pharmacology, Lauerence DR, Churchill Livingstone
- 3) Pharmacology and Pharmacotherapeutics Part I & Part II, Satoskar R.S. & Bhandarkar S.D, Popular Prakashan Mumbai.
- 4) Essentials of Medical Pharmacology, Tripathi K.D, Jaypee Brothers
- 5) Medical Pharmacology, Udaykumar, CBS publishing

Subject: General Medicine

- 1) Textbook of Medicine Davidson
- 2) Textbook of Medicine Hutchinsonson

Subject: General Surgery

- 1) Short practice of Surgery, Baily & Love
- 2) A Consice Text Book of Surgery, S.Das

Subject: Oral Pathology & Oral Microbiology

- 1) A Text Book of Oral Pathology Shafer, Hine & Levy
- 2) Oral Pathology - Clinical Pathologic correlations Regezi & Sciubba.
- 3) Oral Pathology Soames & Southam.
- 4) Oral Pathology in the Tropics Prabhu, Wilson, Johnson & Daftary
- 5) Synopsis of Oral Pathology, Bhaskar, CBS publishing
- 6) Textbook of Oral Pathology-Ghom,Mhaske

Subject: Public Health Dentistry

- 1) Dentistry Dental Practice and Community by David F. Striffler and Brain A. Burt, W. B. Saunders Company
- 2) Principles of Dental Public Health by James Morse Dunning, Harward University Press.
- 3) Dental Public Health and Community Dentistry Ed by Anthony Jong Publication by The C. V. Mosby Company
- 4) Community Oral Health-A system approach by Patricia P. Cormier and Joyce I. Levy published by Apple ton-Century-Crofts/ New York,
- 5) Community Dentistry-A problem oriented approach by P. C.
- 6) Dental Hand book series Vol.8 by Stephen L. Silverman and Ames F. Tryon, Series editor-Alvin F. Gardner, PSG Publishing company Inc. Littleton Massachusetts,
- 7) Dental Public Health- An Introduction to Community Dentistry. Edition by Geoffrey L. Slack and Brain Burt, Published by John Wright and sons Bristol.
- 8) Oral Health Surveys- Basic Methods, 1997, published by W. H. O Geneva available at the regional office New Delhi.
- 9) Preventive Medicine and Hygiene-By Maxcy and Rosenau, published by Appleton Century Crofts,
- 10) Preventive Dentistry-by J. O. Forrest published by John Wright and sons Bristoli,
- 11) Preventive Dentistry by Murray,.
- 12) Text Book of Preventive and Social Medicine by Park and park,
- 13) Community Dentistry by Dr. Soben Peter.

Subject: Research methodology and Bio-statistics

- 1) Introduction to Bio-statistics by B. K. Mahajan
- 2) Introduction to Statistical Methods by Grewal

Subject: Paediatric and Preventive Dentistry

- 1) Dentistry for the Child and Adolescence - Mc. Donald.
- 2) Pediatric Dentistry (Infancy through Adolescence) - Pinkham.
- 3) Pediatric Dentistry : Total Patient Care – Stephen H.Y. Wei
- 4) Clinical Pedodontics – Sidney B. Finn
- 5) Fundamentals of Pediatric Dentistry – R.J. Mathewson
- 6) Handbook of Clinical Pedodontics - Kenneth. D.
- 7) Text Book of Pedodontics- Shobha Tandon
- 8) Pediatric Dentistry - Damle S. G.
- 9) Kennedy's Pediatric Operative Dentistry - Kennedy & Curzon.
- 10) Handbook of Pediatric Dentistry – Cameron and Widmer
- 11) Pediatric Dentistry - Richard R. Welbury
- 12) Pedodontics: A Clinical Approach - Goran Koch
- 13) Orthodontics and Pediatric Dentistry (Colour Guide) - D Millet & R Welbury
- 14) Color Atlas of Oral Diseases in Children and Adolescents - George Laskaris
- 15) Dental Management of the Medically Compromised Patient –J.W. Little
- 16) Pediatric Dentistry – Scientific Foundations and Clinical Practice – Stewart and Barber.
- 17) Clinical Use of Fluorides - Stephen H. Wei.
- 18) Understanding of Dental Caries - Niki Foruk.
- 19) Essentials of Community & Preventive Dentistry - Soben Peters.
- 20) Behaviour Management – Wright
- 21) Traumatic Injuries - Andreason.
- 22) Occlusal Guidance in Pediatric Dentistry - Stephen H. Wei / Nakata
- 23) Pediatric Oral & Maxillofacial Surgery - Kaban.
- 24) Pediatric Medical Emergencies - P. S. Whatt.
- 25) An Atlas of Glass Ionomer Cements - G. J. Mount..
- 26) Textbook of Pediatric Dentistry - Braham Morris.
- 27) Primary Preventive Dentistry - Norman O. Harris.

- 28) Preventive Dentistry - Forrester.
- 29) Contemporary Orthodontics - Proffit..
- 30) Preventive Dentistry - Depaola.
- 31) Endodontics - Ingle.
- 32) Pathways of Pulp - Cohen.
- 33) Management of Traumatized anterior Teeth - Hargreaves.

Subject: **Oral Medicine and Radiology**

Oral Diagnosis, Oral Medicine & Oral Pathology

- 1) Oral Medicine, Burkit, J.B. Lippincott Company
- 2) Principles of Oral Diagnosis, Coleman, Mosby Year Book
- 3) Oral Manifestations of Systemic Diseases, Jones, W.B. Saunders company
- 4) Oral Diagnosis & Oral Medicine, Mitchell
- 5) Oral Diagnosis, Kerr
- 6) Oral Diagnosis & Treatment ,Miller
- 7) Clinical Methods, Hutchinson
- 8) Shafers, Oral Pathology
- 9) Principles and practice of Oral Medicine, Sonis.S.T., Fazio.R.C. and Fang.L

Oral Radiology

- 1) Oral Radiology White & Goaz, Mosby year Book
- 2) Dental Radiology, Weahrman,C.V. Mosby Company
- 3) Oral Roentgenographs Diagnosis,Stafne,W.B.Saunders Co
- 4) Fundamentals of Dental radiology, Sikri, CBS Publishing.

Subject: **Orthodontics and Dentofacial Orthopaedics**

- 1) Contemporary Orthodontics- William R. Proffit
- 2) Orthodontics For Dental Students- White And Gardiner
- 3) Handbook Of Orthodontics- Moyers
- 4) Orthodontics - Principles And Practice- Graber
- 5) Design, Construction And Use Of Removable Orthodontic Appliances- C. Philip Adams
- 6) Clinical Orthodontics: Vol 1 & 2- Salzmann

Subject: Oral and Maxillofacial Surgery

- (1) Impacted teeth, Alling John et al
- (2) Principles of Oral&maxillofacial Surgery vol1,2&3 Peterson LJ et al
- (3) Text book of Oral&maxillofacial Surgery, Srinivasan B
- (4) Hand book of Medical emergencies in the dental office, Melamed SF
- (5) Killey's Fracture of the Mandible, Banks
- (6) Killey's Fractures of the Middle 3 of the Facial Skeleton; Banks P
- (7) The Maxillary Sinus and its Dental Implications; Mc Govanda
- (8) Killey and Kays Outline of Oral Surgery - Part I & 2; Seward GR & et al
- (9) Essentials of Safe Dentistry for the Medically Compromised Patients; Mc Carthy FM
- (10) Oral & Maxillofacial Surgery, Vol I & 2; Laskin DM
- (11) Extraction of Teeth; Howe GL
- (12) Minor Oral Surgery; Howe GL
- (13) Contemporary Oral & Maxillofacial Surgery; Peterson LJ
- (14) Text book of Oral & Maxillofacial Surgery , Neelima Anil Malik
- (15) Text book of Oral & Maxillofacial Surgery, SM Balaji
- (16) Principles of Oral Surgery; Moore J'R
- (17) Handbook of Local Anaesthesia, Malamed
- (18) Sedation; Malamed
- (19) Text book of Oral & Maxillofacial Surgery; Gustav O Kruger
- (20) A Practical guide to Hospital Dentistry, Dr. George Varghese, Jaypee brothers publishing, New Delhi.
- (21) A Practical guide to the Management of Impacted Tooth, Dr. George Varghese, Jaypee brothers publishing, New Delhi.
- (22) Textbook of Local Anaesthesia; Monheim

Subject: Prosthodontics, and Crown & Bridge

- 1) Syllabus of Complete denture -Charles M.Heartwell Jr. and Arthur O. Rahn
- 2) Prosthodontic treatment for edentulous patients- Carl O.Boucher
- 3) Essentials of complete denture prosthodontics by - Sheldon Winkler.
- 4) Maxillofacial prosthetics by - Willam R.Laney.
- 5) McCracken's Removable partial Prosthodontics
- 6) Removable partial Prosthodontics by - Ernest L. Miller and Joseph E.Grasso.
- 7) Stewart's Clinical Removable Partial Prosthodontics, Quintessence Publishing Co.
- 8) Fundamentals of Fixed Prosthodontics, Shillingburg, Quintessence Publishing Co.
- 9) Management of Temporomandibular Disorders and Occlusion, Jeffery P.Okeson, Mosby Year book,Inc.
- 10) A Primer on Complete Denture Prosthodontics, K Chandrasekharan Nair, Ahuja Publishing house.
- 11) Textbook of Prosthodontics,V Rangarajan & TV Padmanabhan,Elsevier.

Subject: Periodontology

- 1) Glickman's Clinical Periodontology-Carranza
Reference books
- 1) Essentials of Periodontology and periodontics- Torquil MacPhee
- 2) Contemporary periodontics- Cohen
- 3) Periodontal therapy- Goldman
- 4) Orbans' periodontics- Orban
- 5) Oral Health Survey- W.H.O.
- 6) Preventive Periodontics- Young and Stiffler
- 7) Advanced Periodontal Disease- John Prichard
- 8) Clinical Periodontology- Jan Lindhe
- 9) Periodontics- Baer & Morris.

Subject: Conservative Dentistry and Endodontics

- 1) The Art & Science of Operative Dentistry, Sturdevant, Mosby U.S.A
- 2) Principle & Practice of Operative Dentistry, Charbeneau, Varghese Publishing, Mumbai.
- 3) Sturdevant's Art & Science of Operative Dentistry, Heymann, Swift, Ritter & Gopikrishna- South Asia Edition.
- 4) Fundamentals of Operative Dentistry- Summit, Robbins, Hilton, Schwartz.
- 5) Grossman's Endodontic Practice, B.Suresh Chandra & V.GopiKrishna, Wolters Kluwer
- 6) Endodontics in Clinical Practice- Harty

Subject: Esthetic Dentistry

- 1) Esthetic guidelines for restorative dentistry; Scharer & others
- 2) Esthetics of anterior fixed prosthodontics; Chiche (GJ) & Pinault (Alain)
- 3) Esthetic & the treatment of facial form, Vol 28; Mc Namara (JA)
- 4) Contemporary Esthetic Dentistry – George. A. Freedman.

Subject: Forensic Odontology

- 1) Practical Forensic Odontology- Derek.H.Clark, Butterworth-Heinemann
- 2) Manual of Forensic Odontology, C Michael Bowers, Gary Bell

Subject: Behavioural Science

- 1) General Psychology- Hans Raj, Bhatia
- 2) Behavioural Sciences in Medical Practice- Manju Mehta
- 3) General psychology — Hans Raj, Bhatia
- 4) General psychology — Munn
- 5) Sciences basic to psychiatry -- Basanth Puri & Peter J Tyrer

Subject: Ethics

- 1) Medical Ethics, Francis C M, Jaypee Brothers, New Delhi

Subject: Implantology

- 1) Contemporary Implant Dentistry, Carl. E.Misch, Mosby
- 2) Osseointegration and Occlusal Rehabilitation, Hobo S., Ichida. E. and Garcia L.T. Quintessence Publishing Company,

Note:

1. Book titles will keep on adding in view of the latest advances in the Dental Sciences.
2. Standard books from Indian authors are also recommended

2.19 Reference books: Included along with recommended books

2.20 Journals

List of Journals

- 1) Journal of Dentistry
- 2) British Dental Journal
- 3) International Dental Journal
- 4) Dental Abstracts
- 5) Journal of American Dental Association
- 6) British Journal of Oral and Maxillofacial Surgery
- 7) Oral Surgery, Oral Pathology and Oral Medicine
- 8) Journal of Periodontology
- 9) Journal of Endodontics
- 10) American journal of Orthodontics and Dentofacial Orthopaedics
- 11) Journal of Prosthetic Dentistry
- 12) International Journal of Prosthodontics
- 13) Journal of Public Health Dentistry
- 14) Endodontics and Dental Traumatology
- 15) Journal of Dental Education
- 16) Dental Update
- 17) Journal of Dental Material
- 18) International Journal of Pediatric Dentistry
- 19) International Journal of Clinical Pediatric dentistry

Note: This is the minimum requirement. More journals both Indian and Foreign are recommended for imparting research oriented education.

2.21 Logbook: Refer syllabus

3. EXAMINATIONS

3.1 Eligibility to appear for University examinations

a) Preface:

- i. Evaluation is a continuous process, which is based upon criteria developed by with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned B.D.S. programme.
- ii. Evaluation is achieved by two processes
 - 1) Formative or internal assessment
 - 2) Summative or university examinations.

Formative evaluation is done through a series of tests and examinations conducted periodically by the institution.

Summative evaluation is done by the university through examination conducted at the end of the specified course.

b) Methods of evaluation:

Evaluation may be achieved by the following tested methods:

- i. Written test
- ii. Practical examination
- iii. Clinical examination
- iv. Viva voce

c) Eligibility criteria:

For a candidate to be eligible to write the university examination of an year of study **for the first time** he/she should have minimum 80% attendance in **all the subjects** in which examination is being held for the year of study and a minimum of 70% in Lectures and Practical/ Clinical separately in all the non-exam subjects for the year (Refer Section 1.8). However candidates with such 80% attendance in all the subjects of study for which university examination is held for a particular year will be eligible to attempt the university examination **only in those subjects** in which he/she has secured the minimum requirement of 40% of internal assessment marks. A candidate can reappear for university examination in the failed subjects provided he/she has secured minimum 70% attendance (theory & practical

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separately) and have scored minimum 40% marks in internal assessment conducted for the subject during the supplementary period.

3.2 *Schedule of regular/Supplementary examinations*

The University examination for a subject shall be conducted twice in a year as per the schedule approved by the Board of Examinations at an interval of not less than four to six months as notified by the university from time to time.

3.3 *Scheme of examination Showing Maximum and Minimum Marks*

The scheme of examination for B.D.S. Course shall be divided into 1st B.D.S. examination at the end of the first, 2nd B.D.S. examination at the end of second, 3rd B.D.S. examination at the end of third and Final BDS Part I examination at the end of fourth academic year. The Final B.D.S part II examination will be held on completing six months of the fifth academic year. The examination shall be open to a candidate who satisfies the requirements of attendance, progress and other rules governing the institution and The University.

1. **Distribution of Marks**

i. **For each paper in which written examination is held:**

Theory	
<i>University written examination</i>	70
<i>University Viva Voce</i>	20
<i>Internal assessment</i>	10
Total	100
Practical/ clinical	
<i>University Practical/ Clinical examination</i>	80
<i>Internal assessment</i>	20
Total	100
Aggregate marks for each paper	200

ii. **For Preclinical Examination in Prosthodontics/Conservative Dentistry & Orthodontics**

<i>University Practical examination</i>	60
<i>Viva voce</i>	20
<i>Internal assessment Practical</i>	20
Total	100

preclinical examination in each subject is to be conducted separately.

Detailed mark distribution of each paper for each subject is given in Table below

Distribution of marks in University examination and internal assessment for various subjects from first year to fifth year.

Year of Study	Subjects		Theory Marks				Practical/ Clinical Marks			Grand Total Marks
			University written	Viva Voce	Internal Assessment	Total	University examination	Internal Assessment	Total	
I BDS	General Anatomy including Embryology and Histology		70	20	10	100	80	20	100	200
	General Human Physiology and Biochemistry	Section A Physiology	35	10	5	50	40	10	50	200
		Section B Biochemistry	35	10	5	50	40	10	50	
	Dental Anatomy, Embryology and Oral Histology		70	20	10	100	80	20	100	200
II BDS	General Pathology and Microbiology	Section A Pathology	35	10	5	50	40	10	50	200
		Section B Microbiology	35	10	5	50	40	10	50	
	General and Dental Pharmacology and Therapeutics		70	20	10	100	80	20	100	200
	Dental Materials	Section A Prosthodontics	35	10	5	50	40	10	50	200
		Section B Conservative dentistry	35	10	5	50	40	10	50	
	Pre Clinical Conservative Dentistry		-	20	-	20	60	20	80	100
	Pre Clinical Prosthodontics		-	20	-	20	60	20	80	100
	Pre Clinical Orthodontics		-	20	-	20	60	20	80	100
III BDS	General Medicine		70	20	10	100	80	20	100	200
	General Surgery		70	20	10	100	80	20	100	200
	Oral Pathology & Oral Microbiology		70	20	10	100	80	20	100	200
Final BDS part I	Oral Medicine and Radiology		70	20	10	100	80	20	100	200
	Periodontology		70	20	10	100	80	20	100	200
	Orthodontics & Dentofacial Orthopaedics		70	20	10	100	80	20	100	200
	Public Health Dentistry		70	20	10	100	80	20	100	200
Final BDS part II	Prosthodontics & Crown and Bridge		70	20	10	100	80	20	100	200
	Conservative Dentistry and Endodontics		70	20	10	100	80	20	100	200
	Paediatric & Preventive Dentistry		70	20	10	100	80	20	100	200
	Oral & Maxillofacial Surgery		70	20	10	100	80	20	100	200

3.4 Papers in each year

I B.D.S. Examination:

- i. General Anatomy including Embryology and Histology
- ii. General Human Physiology and Biochemistry
- iii. Dental Anatomy, Embryology and Oral Histology

II B.D.S. Examination:

Only a candidate who has successfully completed and passed all the 1st B.D.S. subjects can appear.

- i. General Pathology and Microbiology
- ii. General and Dental Pharmacology and Therapeutics
- iii. Dental Materials
- iv. Pre Clinical Conservative Dentistry(Only Practical and Viva)
- v. Pre Clinical Prosthodontics and Crown & Bridge (Only Practical and Viva)
- vi. Pre Clinical Orthodontics (Only Practical and Viva)

III B.D.S. Examination:

Only a candidate who has successfully completed and passed all the 2nd B.D.S. subjects can appear.

- i. General Medicine
- ii. General Surgery
- iii. Oral Pathology & Oral Microbiology

Final BDS - Part I Examination:

Only a candidate who has successfully completed and passed all the 3rd BDS subjects can appear.

- i. Oral Medicine and Radiology
- ii. Periodontology
- iii. Orthodontics & Dentofacial Orthopaedics
- iv. Public Health Dentistry

Final BDS - Part II Examination:

Only a candidate who has appeared for the Final BDS Part I examination can appear.

- i. Prosthodontics & Crown and Bridge
- ii. Conservative Dentistry and Endodontics
- iii. Oral & Maxillofacial Surgery
- iv. Paediatric & Preventive Dentistry

3.5 Details of theory examination (written)

1. The written examination in each paper will be of three hours duration and shall have maximum marks of 70. Type of Questions and Distribution of marks for written examination should be as given in **table I** given below.
2. The paper of Physiology & Biochemistry will be divided into two Sections, Section A (Gen. Physiology) and Section B (Biochemistry) of equal marks. Type of Questions and Distribution of marks for written examination should be as given in **table II** below.
3. The paper of Pathology & Microbiology will be divided into two Sections, Section A (Gen. Pathology) and Section B (Microbiology) of equal marks. Type of Questions and Distribution of marks for written examination should be as given in **table III** below.
4. The paper of Dental Materials will be divided into two Sections, Section A (Prosthodontics) and Section B (Conservative Dentistry) of equal marks. Type of Questions and Distribution of marks for written examination should be as given in **table IV** below.
5. The question paper should contain different types of questions like essay, short note and brief note.
6. The nature of questions should be aimed to evaluate students of different standards ranging from average to excellent.
7. The questions should cover as broad an area of content of the course as possible. The essay questions should be properly structured and the marks specifically allotted.

Table I.

Type of Questions	No. of Questions	Marks / Question	Total Marks
Structured Essay	2	10	20
Short note	4	5	20
Brief note	10	3	30
Grand Total			70

Table II.

Physiology and Biochemistry

Subject	Type of Questions	No. of Questions	Marks of Questions	Total Marks
Section A Physiology	Structured Essay	1	10	10
	Short note	2	5	10
	Brief note	5	3	15
	Grand Total			35

Subject	Type of Questions	No. of Questions	Marks of Questions	Total Marks
Section B Biochemistry	Structured Essay	1	10	10
	Short note	2	5	10
	Brief note	5	3	15
	Grand Total			35

Table III.
Pathology and Microbiology

Subject	Type of Questions	No. of Questions	Marks of Questions	Total Marks
Section A Pathology	Structured Essay	1	10	10
	Short note	2	5	10
	Brief note	5	3	15
	Grand Total			35

Subject	Type of Questions	No. of Questions	Marks of Questions	Total Marks
Section B Microbiology	Structured Essay	1	10	10
	Short note	2	5	10
	Brief note	5	3	15
	Grand Total			35

Table IV.
Dental Materials

Subject	Type of Questions	No. of Questions	Marks of Questions	Total Marks
Section A Prosthodontics	Structured Essay	1	10	10
	Short note	2	5	10
	Brief note	5	3	15
	Grand Total			35

Subject	Type of Questions	No. of Questions	Marks of Questions	Total Marks
Section B Conservative Dentistry	Structured Essay	1	10	10
	Short note	2	5	10
	Brief note	5	3	15
	Grand Total			35

*

3.6 Model question paper for each subject

Given as Annexure

3.7 Internal assessment

The internal assessment examinations in theory and practical/ clinical may be held at least twice in a particular year followed by a model examination in the pattern of university examination to be held at the end of the year of study. Internal assessment marks for a candidate in a subject will be calculated as the average of, marks obtained in the model examination and the highest among all other internal examinations, in the subject. This average mark will be reported to the University. The Heads of the Department and College Principal should ensure that the class average of internal assessment marks reported to the University in each subject/paper is not more than 75% in both theory and practical/clinical separately. For a student to be eligible to appear for the University examination he/she should have secured at least 40% of maximum marks in internal assessment for both theory and practical/clinical in all subjects/papers, separately (i.e. minimum 4/10 in theory and 8/20 in practical/clinical). *(For calculating internal assessment mark in papers where subjects are combined viz. General Human Physiology & Biochemistry, General Pathology & Microbiology and Dental Materials, marks obtained in the two subjects will be counted together for reporting to University and for applying all other stipulations mentioned above)*

3.8 Details of Practical/Clinical examinations

1. Objective Structured Clinical Evaluation:

The clinical /practical examination should include different procedures for the candidate to express one's skills. A number of examination stations with specific instructions to be carried out may be provided. This can include clinical procedures, laboratory experiments, spotters etc. Evaluation must be made objective and structured. The method of objective structured clinical examinations should be followed. This will avoid examiner bias because both the examiner and the examinee are given specific instructions on what is to be observed at each station.

2. Records/Log Books:

The candidate should be given credit for his records based on the scores obtained in the record. The marks obtained for the record in the first appearance can be carried over to the subsequent appearances if necessary.

3. Scheme of clinical and practical examinations:

The specific scheme of clinical/practical examinations, the type of clinical procedures/experiments to be performed and marks allotted for each are given in Scheme of examination for each subject (Section 2.6). Changes if any should be discussed and finalized by the Chairman and members of the board of examiners and to be published prior to the conduct of the examinations along with the publication of time table for practical examination. This scheme should be brought to notice of the external examiner as and when the examiner reports. The practical/clinical examinations should be evaluated by two examiners of which one shall be an external examiner appointed from other zones of the university or outside University. Each candidate should be evaluated by each examiner independently and marks computed at the end of the examination.

3.9 Number of Examiners (internal & external) and their qualifications

For practical/Clinical and Viva voce examination there shall be two examiners for each paper, one internal and one external, from Medical/ Dental Institutions approved/recognized by the Dental Council of India for B.D.S. Course. The internal examiner will be from within the institution. The external examiner can be from a different zone of the University or from outside University. When the number of candidates registered for a subject/s in a particular examination exceeds 75, two sets of examiners (one external & one internal each) may be appointed for the subject/s, such that the practical and viva examination for the first half of candidates may be conducted by one set of examiners and that of the remaining candidates may be done by the other set of examiners. No person shall be an External Examiner to the same college for more than 3 consecutive years. However, if there is a break of one year the person can be reappointed.

Note:

- 1) *In case of Physiology and Biochemistry if Internal examiner is from Physiology, External examiner should be from Biochemistry and vice versa*
 - 2) *In case of Pathology and Microbiology if Internal examiner is from Pathology, External examiner should be from Microbiology and vice versa*
- In case of Dental Materials, if Internal examiner is from Prosthodontics, External examiner should be from Conservative Dentistry and vice versa*

Qualification and experience to be eligible for examinership for BDS examination:

- 1) M.D.S. Degree in the concerned subject from a DCI recognized Institution.
- 2) Four years teaching experience in the subject after MDS in the concerned subject in a Dental College approved/recognized by the Dental Council of India for BDS.
- 3) Should be qualified as per DCI to hold the post of Reader or above in a Dental Institution approved/recognised by the Dental Council of India for B.D.S.
- 4) In case of medical subjects the qualification of examiners shall be the same as that prescribed by the Dental Council of India for the concerned subject.
- 5) Age not more than 65 years or as prescribed by DCI from time to time.

3.10 Details of Viva.

Viva voce is an excellent mode of assessment because it permits a fair broad coverage and it can assess the problem solving capacity of the student. An assessment related to the affective domain is also possible through viva voce. It is desirable to conduct the viva voce independently by each examiner. In order to avoid vagueness and to maintain uniformity of standard and coverage, questions can be pre-formulated before administering them to each student. Twenty marks are exclusively allotted for viva voce and that can be divided amongst the two examiners.

4. INTERNSHIP

COMPULSORY PAID ROTATING INTERNSHIP PROGRAMME (CRRI)

4.1 Eligibility for Internship:

Candidates who fulfill the following criteria are eligible to start Internship (CRRI):

1. Must have successfully completed all the Final BDS Part I and Part II examinations within the stipulated time frame, if any.
2. Must have obtained temporary registration from Kerala Dental Council.
3. Must have satisfied all other criteria, if any, for starting internship put forth by the Institution, University and DCI from time to time.

4.2 Details of Internship Training Programme:

1. Start of Internship programme

As far as possible the internship programme will commence within 10 days after the declaration of Final BDS part II result by the University. Before commencement of the Internship training Programme the Dean/ Principal shall conduct Orientation Workshop for the interns to get acquainted with the details of Internship training Programme. The Orientation Workshop shall cover Ethical issues, Patient Management, Public Relation issues, Emergency Care of the patients (including CPR), Medico-legal issues, Public Health and National Oral Health Policy. It shall be mandatory for the all the interns to attend the Orientation Workshop. The period of the workshop shall be included in the period of one year Internship.

2. Curriculum of Dental internship programme

1. The duration of Internship shall be one year (365 days), not relaxable under any pretext.
2. All parts of internship shall be done in a Dental College duly recognized/ approved by the Dental Council of India for the purpose of imparting education and training to Dental graduates in the country.
3. During the internship period the candidates will be posted in all the clinical departments of the institution.
4. Each Intern shall be paid stipendiary allowance during the period of internship not extending beyond a period of one year.

5. The internship shall be compulsory and rotating as per the regulations prescribed for the purpose.
6. During the internship period they will have to attend to the routine clinical activities of the department under the supervision of faculty members.
7. The interns will also be posted in the Dental Casualty for attending to the emergency services of the institution and may also include rural postings at satellite dental clinics of the institution.
8. Internship is considered as an integral part of BDS course and hence the B.D.S. degree shall be conferred only on satisfactory completion of internship.
9. As far as possible the Internship training Programme shall be commenced by the concerned Dean/ Principal not later than 10 days from the date of declaration of Final B.D.S. Part II result by KUHS.

3. Determinants of Curriculum for internship:

1. The curricular contents of internship training shall be based on:
 2. Dental health needs of the society.
 3. Financial, material and manpower resources available for the purpose.
 4. National Dental Health Policy.
 5. Socio-economic conditions of the people in general.
 6. Existing Dental facilities at par with the primary health care concept for the delivery of health services.
 7. Task analysis of what dental graduates are expected to do in Dentistry in various practice settings. (Private and Government service.)
 8. Epidemiological studies conducted to find out prevalence of different dental health problems, taking into consideration the magnitude of dental problems, severity of dental problems and social disruption caused by these problems.

4. Objectives –

- A. *To facilitate reinforcement of learning and acquisition of additional knowledge:-*
 - a. Reinforcement of knowledge.
 - b. Techniques & resources available to the individual and the community: Social and cultural setting.
 - c. Training in a phased manner, from a shared to a full responsibility.

B. *To facilitate the achievement of basic skills: attaining competence vs. maintaining competence in:-*

- a. History taking.
- b. Clinical Examination.
- c. Performance and interpretation of essential laboratory data.
- d. Data analysis and inference.
- e. Communication skills aimed at imparting hope and optimism in the patient.
- f. Attributes for developing working relationship in the Clinical setting and Community team work.

C. *To facilitate development of sound attitudes and habits:-*

- a. Emphasis on individual and human beings, and not on disease/symptoms.
- b. Provision of comprehensive care, rather than fragmentary treatment
- c. Continuing Dental Education and Learning of accepting the responsibility,

D. *To facilitate understanding of professional and ethical principles including: -*

- a. Rights and dignity of patients
- b. Consultation with other professionals and referral to seniors/institutions.
- c. Obligations to peers, colleagues, patients, families and Community.
- d. Provision of free professional services in an emergent situation.

E. *To initiate individual and group action, leading to disease prevention and oral and dental health promotion, at the level of individuals, families and the Community.*

F. *To maintain day to day record, in the form of a performance log book, the quantum of work done and any other assignment allotted to each intern by the department.*

HOD/Teaching staff supervising the intern shall duly certify the work done by awarding grades.

(Complete record of all cases treated department wise to be prepared and presented in the form of performance Log book and case files at the time of completion of internship programme.)

5. Content (subject matter) –

The compulsory rotating paid Dental Internship shall include training in Oral Medicine & Radiology; Oral & Maxillofacial Surgery; Prosthodontics; Periodontics; Conservative

Dentistry; Paediatric Dentistry; Oral Pathology & Microbiology; Orthodontics and Community Dentistry .

6. Duties & responsibilities of Intern posted in various departments:-

- i. Attending to the routine O.P in the Department
- ii. Carrying out the routine clinical procedures in the department
- iii. Carrying out Patient and instrument Preparation for clinical procedures.
- iv. Carrying out all Clinical procedures including impression making, and pouring casts (i.e. steps including mixing of impression materials & gypsum products, mixing of restorative materials and removal of casts from impressions to be done by the intern without seeking assistance)
- v. Fabrication insertion and follow up of removable orthodontic appliances.
- vi. Attending to the casualty duties of the institution
- vii. Maintenance of log book and records
- viii. Carrying out any other duty as instructed by the Head of the Department.
- ix. Maintenance of proper dress code and attire.

Note: The entire clinical work done by intern will be under the supervision of faculty members. In the absence of faculty the intern will be under the supervision of Senior/Junior Resident.

7. General Guidelines: -

It shall be task-oriented training. The interns should participate in various institutional and field programmes and be given due responsibility to perform the activities in all departments of the Dental College and associated Institutions.

In order to facilitate achievement of basic skills and attitudes, following facilities should be provided to all dental graduates:

- I. History taking, examination, diagnosis, charting and recording treatment plan of cases.
- II. Presentation of cases in a group or Seminar.
- III. Care and sterilization of instruments used in dental practice.
- IV. Performance and interpretation of essential laboratory tests and other relevant investigations.
- V. Data analysis and inference.

- VI. Proper use of antibiotics, anti-inflammatory and other drugs, as well as other therapeutic modalities.
- VII. Education of patients, their relatives and community on all aspects of dental health care while working in the institution as also in the field.
- VIII. Communication aimed at inspiring hope, confidence and optimism.
- IX. Legal rights of patients and obligations of dental graduate under forensic jurisprudence.
- X. It shall be binding on the interns to follow strictly the 'Code of Conduct' prescribed by the institution/ University/ Govt. for the regulation of the conduct of a Dental student in the State of Kerala.

Breach of Code of Conduct / discipline by the intern shall disqualify him/her from pursuing Internship Training Programme for a period as may be specified by the institutions/ University in such cases.

- XI. The University has laid down the minimum quantum of work to be done by each intern department wise; however the clinical work allotted by the department has to be necessarily carried out by the intern.
- XII. Workshops to be arranged by the colleges immediately after publication of final BDS part II result to orient the interns about ethical issues, patient management issues, public relation issues, emergency care of the patients, medico-legal issues, record keeping, public health & national oral health policy etc.

8. Duration of internship in each department.

Sl.No.	Department	No. of Days
1.	Prosthodontics and Crown & Bridge	60
2.	Oral & Maxillofacial Surgery	60
3.	Conservative dentistry& Endodontics	45
4.	Periodontics	45
5.	Paediatric and Preventive Dentistry	30
6.	Oral Medicine & Radiology	30
7.	Orthodontics and Dentofacial Orthopaedics	30
8.	Public Health Dentistry/ Rural services/Palliative care	30
9.	Oral Pathology & Oral Microbiology including Forensic Odontology	15
10.	Elective (any of the subjects listed from 1 to 7)	20

9. Leave

Leave is not the right of an intern. For any kind of leave prior permission from the head of the department where the intern is posted is mandatory. An intern shall be entitled for a maximum of 15 days leave during one year period of internship posting. An intern will not be permitted to avail more than 3 days leave in any department. Period of leave in excess of 3 days in a department will have to be repeated in the same department as extension posting. Under any circumstances including maternity leave this period will not be condoned by any authority.

10. Internship completion certificate

An intern will be issued internship completion certificate (Refer Annexure III) by the office of the Dean / Principal only on completion of internship training programme satisfactorily. It is mandatory for the intern to attend at least one workshop on Basic Life Support and emergency management for issue of the internship certificate.

11. Registration with council

On Successful completion of both Final BDs Part I & II examinations the candidates can apply for issue of provisional degree certificate from the University. Before starting internship a temporary registration from the Kerala Dental council is mandatory. On successful completion of One year internship programme the candidate can apply for permanent degree certificate.

12. Stipend

As per the norms of the government/ KUHS framed from time to time.

13. Eligibility for award of degree

A candidate, who has successfully completed all the subjects of the course and one year internship with in the specified period, if any, will be eligible for the award of degree.

14. Transcript

To be issued by the institution where the candidate underwent training.

4.3 *Model of Internship mark list*

Not Applicable

4.4 Extension rules

The duration of Internship shall be one year (365 days), not relax able under any pretext. An intern shall be entitled for a maximum of 15 days leave during one year period of internship posting. Period of leave in excess of 3 days in a department will be considered as absence and the candidate will have to do extension posting in the same department for the number of days he was absent in the department.

4.5 Details of training given:

1. Detailed distribution of minimum expected work to be completed (Department-wise):-

a) Oral Medicine & Radiology

The Intern during his/her posting in oral surgery shall perform the following procedures (minimum requirement):

- | | |
|---|---------|
| a) Standardized examination of patients | 5 cases |
| b) Exposure to clinical, pathological laboratory procedures and biopsies/ | 5 cases |
| c) cytology | |
| d) Effective training in taking of Radiographs & processing : (Intra-oral) I.O, Full mouth and (Extra oral) E.O | |
| e) Cephalogram – with interpretation | 1 |
| f) Interpretation of X-rays | 25 nos. |
| g) Orientation to additional investigation techniques like CT Scan/MRI/ Sialography / USG/ Doppler- (optional : where there is scope/ facility) | |

b) Oral and Maxillofacial surgery

A. An Intern during his/her posting in oral surgery shall perform the following procedures (minimum requirement):

- | | |
|--|----|
| a) Extractions | 50 |
| b) Trans-alveolar extractions | 2 |
| c) Assisting / observing & other minor surgery | 2 |

B. the Intern shall perform the following on Cancer Patients (preferential)

- Maintain file work
- Do extractions for radiotherapy cases

- c) Perform biopsies
- d) Observe varied cases of oral cancers

C. An intern shall have 15 days posting in emergency services of a dental/ dental wing of general hospital with extended responsibilities in emergency dental care in the wards. During this period he/she shall attend to emergencies under the direct supervision of oral & maxillofacial surgeon. Emergencies to be assisted and observed:

- a) Toothache
- b) Trigeminal neuralgia
- c) Bleeding from mouth due to trauma, post extraction, bleeding disorder or haemophilia
- d) Airway obstruction due to fracture mandible and maxilla; dislocation of mandible; syncope or vasovagal attacks; Ludwig's angina; tooth fracture; post intermaxillary fixation after general Anaesthesia.
- e) observes the work in I.C.U. with particular reference to resuscitation procedures.
- f) conducts tutorials on medico-legal aspects including reporting on actual cases coming to casualty.

c) Prosthodontics and Crown & Bridge

The interns during their internship posting in Prosthodontics shall perform the following procedures (minimum requirement):

- a) Complete denture (upper & lower) (Clinical Procedures & laboratory work) 3 Cases
- b) Removable Partial Denture (Clinical Procedures & laboratory work) 4 Cases
- c) Planned (cast) partial denture (designing on model only) 1 Case
- d) Learning use of Face bow and Semi anatomic articulator technique
- e) Management of TMD cases etc.(preferable)
- f) Miscellaneous-like Reline/Rebasing / Overdenture/ repairs of Denture/immediate complete denture.

d) Periodontics

An intern shall perform the following procedures (minimum requirement):

- A. Prophylaxis 10 cases
- B. Assist / observe or perform :

a) Flap Operation	2 cases
b) Root Planning	1 case
c) Curettage	1 case
d) Gingivectomy	1 case
e) Perio-Endo cases	1 case

e) Conservative Dentistry& Endodontics

To facilitate reinforcement of learning and achievement of basic skills, the interns shall perform at least the following procedures independently or under the guidance of supervisors (minimum requirement):

a) Routine Restoration work	40 cases
b) Restoration of extensively mutilated teeth	2 cases
c) inlay and onlay preparations	1 case
d) Use of tooth colored restorative materials	4 cases
e) Treatment of discolored vital and non-vital teeth	1 case each
f) Management of pulpless, single-rooted teeth without periapical lesion	1 case
g) Management of acute dentoalveolar Infections	4 cases / as per availability
h) Management of pulpless, single-rooted tooth with periapical lesion	1 case
i) Non-surgical management of traumatised teeth during formative period.	1 case

f) Paediatric and Preventive Dentistry

During their posting in Paediatric Dentistry the intern shall perform (minimum requirement):

a) Topical application of fluorides	5 cases
b) Oral prophylaxis	10 cases
c) Restorative procedures of carious deciduous teeth in children	10 cases
d) Pulpotomy / Pulpectomy	1 case
e) Management of traumatized permanent anterior teeth (RCT)	1 case
f) Fabrication and insertion of Preventive /Interceptive orthodontic appliances	2 cases
g) Extractions	30 cases
h) Minor oral surgical procedures	

- i) (Surgical exposure of unerupted teeth, mucocoele excision, frenectomy etc) 1 case
- j) Management of Dento alveolar fractures 1 case
- k) Management of Special children 2 cases
- l) Comprehensive treatment including case discussion, maintenance of clinical records, Primary, secondary & tertiary levels of prevention including diet recording and diet counseling 1 case

g) Oral Pathology and Oral Microbiology including Forensic Odontology

An intern shall perform the following (minimum requirement):

- a) History-recording and clinical examination 5 cases
- b) Blood. Urine and Sputum examination 5 cases
- c) Exfoliative Cytology and smears study 2 cases
- d) Biopsy -Laboratory procedure & reporting 1 case
- e) Preparation of ground section 2

Interns may also be posted in the Forensic Medicine Department of the attached Medical College.

h) Orthodontics and Dentofacial Orthopaedics

A. an intern shall observe the following procedures during their posting in Orthodontics (minimum requirement):

- a) Detailed diagnostic procedures 5 patients
- b) Laboratory techniques including wire-bending for removable appliances. Soldering and processing of myo-functional appliances.
- c) Treatment plan options and decisions.
- d) Making of bands, bonding procedures and wire insertions.
- e) Use of extra oral anchorage and observation of force values.
- f) Retention.
- g) Observe handling of patients with oral habits causing malocclusions.

B. an intern shall do the following laboratory work (minimum requirement):

- a) Wire bending for removable appliances and space-maintainers including welding and heat treatment procedure 5 cases
- b) Soldering exercises, banding & bonding procedures 2 cases

- c) Cold-cure and heat-cure acrylisation of simple orthodontic Appliances 5 cases

C. an Intern shall carry out the following clinical work (minimum requirement):

- a) Diagnosis and treatment plan including cephalometric analysis 5 cases
b) Fabrication of removable appliances with different problems 4 cases
c) Orthodontic impressions and bite-recordings. 5 cases

i) **Public Health Dentistry**

1. The intern shall conduct health education sessions for individuals and groups on oral health, public health nutrition, behavioural sciences, environmental health, preventive dentistry and oral epidemiology.
2. They shall conduct a short-term epidemiological survey in the community or in the alternate, participate in the planning and methodology
3. They shall arrange effective demonstration of (minimum requirement):
 - a) Preventive and interceptive procedures for prevalent dental diseases.
 - b) Mouth-rinsing and other oral hygiene demonstrations 5 cases
 - c) Tooth brushing techniques 5 cases
4. Conduction of oral health education programmes at (minimum requirement):-
 - a) School setting 2
 - b) Community setting 2
 - c) Adult education programmes 2
5. Preparation of Health Education materials 5
6. Exposure to team concept and National Health Care systems:
 - a) Observation of functioning of health infrastructure.
 - b) Observation of functioning of health care team including multipurpose; workers (male and female), health educators and other workers.
 - c) Observation of atleast one National Health Programme.
 - d) Observation of interlinkages of delivery of oral health care with Primary Health Care and visit to a water treatment plant.

Mobile dental clinics should be made available for this training.

j) Elective Posting

An Intern shall be posted for 20 days in any of the above clinical dental departments as per choice and availability.

2. Organisation of content

The Curriculum during the 4 ½ years of B.D.S. training is subject-based with more emphasis on learning practical skills. During one-year internship the emphasis will be on competency-based community-oriented training. The practical skills to be mastered by an intern along with the minimum performance level are given under the course content of different departments of Dental Education. The supervisors should see to it that proper facilities are provided in all departments and attached institutions for their performance.

3. Specification of teaching activities

Didactic lectures are delivered during the four and half years training in B.D.S. These shall be avoided. During the internship programme emphasis shall be on the chair-side teaching, small group teaching and discussions: tutorials, seminars, ward posting, laboratory posting, field visits and self-learning.

4. Use of Resource Materials

Overhead projectors, slide projectors, film projectors, charts, diagrams, photographs, posters, specimens, models and other audio-visual aids shall be provided in all the Dental Colleges and attached institutions and field areas. If possible, television and video tapes showing different procedures and techniques to be mastered by the intern should be provided. Use of computers/ advance facilities may be encouraged.

The intern shall submit minimum one educative chart/ model to any one department. The chart/model should have importance from the view of public awareness.

The intern shall prepare and submit minimum one scientific paper (Library dissertation) under the guidance of teacher by utilizing resources from library/ Internet etc.

5. Evaluation –

1. Formative Evaluation:

Day-to-day assessment of each intern during their internship posting should be done. The objective is that all the interns must acquire necessary minimum skills required for carrying out day-to-day professional work competently. This can be achieved by maintaining records and performance data book by each intern. This will not only

provide a demonstrable evidence of the processes of training but also more importantly, of the intern's own acquisition of competencies as related to performance. It shall form a part of formative evaluation and shall also constitute a component of final grading of interns.

Cases treated by interns in respective department to be thoroughly observed and grades to be awarded on the same day by the in charge of the Internship Training Programme.

6. Skill Tests:

Evaluation systems shall assess the skills of candidates while performing clinical procedure over the patient during the course of treatment and during the posting in that department. Head of the Department and senior teacher of respective departments shall enlist minimum 10 skills relevant to that specialty and gradation to be given. Scores to be given for performing not less than 5 skills with proficiency and to the satisfaction of the teacher. Maximum 5 marks for each skill and score less than 3 marks will be considered as unsatisfactory performance by the intern.

Gradation of each skill should be done as under:-

a)	Poor	1
b)	Below average	2
c)	Average	3
d)	Above average (Good)	4
e)	Excellent	5

If a candidate is declared as unsuccessful due to unsatisfactory performance in any of the Department he/ she shall be required to repeat the posting in continuation in that Department for a period as deemed fit by Head of the Department in consultation with Dean/ Principal.

Only after satisfactory performance of the skill during subsequent evaluation, the intern shall be eligible for award of internship completion certificate (refer section XII).

7. Summative Evaluation

It shall be based on the observations of the Head and supervising teachers of the Department. The final grading shall be done on the basis of records and performance log book maintained by the intern. In case of dispute, the Dean/Principal in consultation with the concerned Head of the Department and teacher in charge of Internship Training Programme shall take the decision, which shall be final and binding.

5. ANNEXURE

5.1 Check List For Monitoring: Log Book, Seminar Assessment Etc. to be formulated by the Curriculum Committee of the Concerned Institution

5.2 Model Master time table for BDS

5.3 Format of Condonation register

5.4 Format for CRRl certificate

5.5 Model Question papers



MODEL MASTER TIME TABLE FOR BDS

I BDS

Week days	8 am - 9 am	9 am -10 am	10 am -11 am	11 am -12 noon	12 noon -1 pm	1 pm -2 pm
Monday	Physiology	Anatomy	Biochemistry Practicals		Anatomy Practicals	
Tuesday	Dental Anatomy	Anatomy	Biochemistry	Physiology	Anatomy Practicals	
Wednesday	Biochemistry	Physiology	Physiology Practicals		Dental Anatomy Practicals	
Thursday	Dental Anatomy	Prosthodontics PC Practicals			Dental Materials Practicals	
Friday	Dental Anatomy Practicals		Dental Anatomy	Anatomy		Dental Materials
Saturday	C.D PC Practicals			Dental Anatomy Practicals		

II BDS

Week days	8 am - 9 am	9 am -10 am	10 am -11 am	11 am -12 noon	12 noon -1 pm	1 pm -2 pm
Monday	Pathology	Microbiology	Pharmacology Practicals		Pathology Practicals	
Tuesday	Microbiology	Pharmacology	Microbiology Practicals		Oral Pathology Practicals	
Wednesday	Pharmacology	Pathology	Orthodontics PC Practicals		Prosthodontics PC Practicals	
Thursday	Oral Pathology	Dental Materials Practicals		C.D PC	Prosthodontics PC Practicals	
Friday	Dental Materials	Dental Materials Practicals				Prosthodontics PC Practicals
Saturday	Dental Materials	CD PC Practicals		Prosthodontics PC	Orthodontics PC Practicals	

III BDS

Week days	8 am - 9 am	9 am -10 am	10 am -11 am	11 am -12 noon	12 noon -1 pm	1 pm -2 pm
Monday	Surgery	Medicine	Medicine Clinics			Oral Pathology
Tuesday	Medicine	Surgery	Surgery Clinics			OMR
Wednesday	Oral Pathology	Periodontics	Clinics			
Thursday	Pedodontics	Oral Pathology	OMFS	Clinics		
Friday	Prosthodontics	CD	Clinics			
Saturday	PHD	Orthodontics	PHD/OMFS	Oral Pathology Practicals		Prosthodontics PC Practicals

Final BDS Part I

Week days	8 am - 9 am	9 am -10 am	10 am -11 am	11 am -12 noon	12 noon -1 pm	1 pm -2 pm
Monday	OMR	Clinics				OMFS
Tuesday	PHD	Clinics				Pedodontics
Wednesday	Orthodontics	Clinics				
Thursday	Periodontics	Clinics				
Friday	CD	Clinics				
Saturday	Prosthodontics	Clinics				

Final BDS Part II

Week days	8 am - 9 am	9 am - 2 pm
Monday	OMFS	Clinics
Tuesday	CD	Clinics
Wednesday	Prosthodontics	Clinics
Thursday	Pedodontics	Clinics
Friday	Prosthodontics	Clinics
Saturday	OMFS	Clinics

At least 30% of theory classes to be handled by Assoc. Professors & above.

Condonation Register

Name of

College: _____

Sl.No.	Name of Student	KUHS registration number of student	Year and date of request for availing condonation	Examination & subjects for which condonation is availed	Reason for condoning	Remarks	Dated Signature of the Principal

सर्वे भयन्तु सुखिनः



Name of College of Dental Sciences

Emblem of
College of
Dental
Sciences

Compulsory Rotating Resident Internship Certificate

This is to certify that _____ was a bona fide student of name of college for BDS course from _____ to _____. He/She passed the Final BDS Part II examination of the **KERALA UNIVERSITY OF HEALTH SCIENCES**, Thrissur, held in _____ and has successfully completed twelve months of Compulsory Paid Rotating Resident Internship Programme in various departments from _____ to _____ as shown below:

Department	From	to	Extension Posting	
			From	to
Prosthodontics and Crown & Bridge	_____	_____	_____	_____
Conservative Dentistry & Endodontics	_____	_____	_____	_____
Oral & Maxillofacial Surgery	_____	_____	_____	_____
Periodontics	_____	_____	_____	_____
Public Health Dentistry	_____	_____	_____	_____
Paediatric & Preventive Dentistry	_____	_____	_____	_____
Orthodontics & Dentofacial Orthopaedics	_____	_____	_____	_____
Oral Medicine & radiology	_____	_____	_____	_____
Oral pathology & Oral Microbiology including Forensic Odontology	_____	_____	_____	_____
Elective (_____)	_____	_____	_____	_____

The character, conduct and professional performance of him/her during the period of training was _____.

Place:

Date:

Office seal

Principal

QP Code:

Reg. No.....

**First Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
General Human Anatomy including Embryology and Histology**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary

Essay:

(2x10=20)

1. Describe the middle ear in detail under the following headings: • Shape and size • Parts and communications • Contents • Blood supply and nerve supply • Applied anatomy (2+2+3+2+1)
2. Describe the mandibular nerve in detail under the following headings: • Functional components • Course and relations • Branches and distribution • Applied anatomy (2+3+3+2)

Short notes

(4x5=20)

3. Enumerate the para nasal sinuses and mention its functions. Where do each of them open. Mention its clinical importance. (2+2+1)
4. Describe the palatine tonsil under the following headings: • Location • Features • Blood supply (1+3+1)
5. Describe the tongue under the following headings: • External features • Extrinsic muscles. (2+3)
6. Describe the extra ocular muscles including: • Origin and insertion • Actions (3+2)

Brief notes:

(10x3=30)

7. Sub mandibular ganglion
8. Microscopic structure of hyaline cartilage
9. Graafian follicle
10. Tentorium cerebelli
11. Inter peduncular fossa
12. Chromosomes
13. Bell's palsy
14. Pharyngeal pouches
15. Cavity of larynx
16. Structures within the parotid gland

Reg. No.....

**First Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
General Human Physiology and Biochemistry**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary
- Write **section A** and **section B** in separate answer books (32 pages). Do not mix up questions from section A and section B

QP Code:

Section: A Physiology

Max Marks: 35

Essay:

(10)

1. Enumerate the hormones secreted by pituitary gland. Discuss the actions of growth hormone. Add a note on disorders produced by hyper secretion of growth hormone. (2+6+2)

Short notes:

(2x5=10)

2. Describe the endometrial changes during different phases of menstrual cycle, giving its hormonal basis. (3+2)
3. Draw a neat, labeled spirogram. Explain different lung volumes and capacities. (2+3)

Brief notes:

(5x3=15)

4. Molecular basis of muscle contraction.
5. Chemical regulation of respiration
6. Factors influencing spermatogenesis
7. O₂-Hb Dissociation curve
8. Neuromuscular junction

QP Code:

Section: B Biochemistry

Max Marks: 35

Essay:

(10)

9. What is the normal blood pH? Which are blood buffers? Explain renal regulation of blood pH. (1+2+7)

Short notes:

(2x5=10)

10. Explain beta oxidation.
11. Classify jaundice and explain different types. Mention the laboratory findings for each category.

Brief notes:

(5x3=15)

12. Deficiency diseases of vitamin A
13. BMR
14. Functions of calcium
15. Dietary fibers
16. Gout

QP Code:

Reg. No.....

**First Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Dental Anatomy, Embryology and Oral Histology**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary

Essay:

(2x10=20)

1. Enumerate and explain in detail the stages in the life cycle of ameloblast with the help of neat diagrams. (2+6+2)
2. Explain in detail the anatomy of permanent maxillary canine with neat diagrams. Add a note on its chronology. (8+2)

Short notes

(4x5=20)

3. Cap stage of tooth development
4. Types of dentin
5. Permanent maxillary lateral incisor
6. Development of roots of the teeth

Brief notes:

(10x3=30)

7. Enamel spindles
8. Nasmyth's membrane
9. Cell rests of Serre
10. Reciprocal induction
11. Reduced enamel epithelium
12. Perikymata
13. Hydrodynamic theory of tooth sensitivity
14. Traits in dentition
15. Three differences between permanent mandibular central and lateral incisor
16. Define : Cusp, cingulum & Mammelons

QP Code:

Reg. No.....

**Second Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Dental Materials**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary
- Write **section A** and **section B** in separate answer books (32 pages). Do not mix up questions from section A and section B

QP Code:

Section: A Prosthodontics

Max Marks: 35

Essay:

(10)

1. Define impressions in Prosthodontics. Classify Impression Materials. Enumerate in detail the composition, Properties and uses of any one elastic impression material. (2+3+5)

Short notes:

(2x5=10)

2. Classify Dental casting investment materials. Explain in detail about Phosphate bonded investments. (2+3)
3. Enumerate the materials used as denture base resins. Add a brief note on curing cycle of denture base resins. (3+2)

Brief notes:

(5x3=15)

4. CAD- CAM in Prosthodontics
5. Wrought metal alloys
6. Green stick impression compound
7. Stress and strain
8. Describe Hue , value and Chroma.

QP Code:

Section: B Conservative Dentistry

Max

Marks: 35

Essay:

(10)

9. Classify Dental Cements. Explain in detail the composition, properties ,manipulation and uses of Poly carboxylate cement. (3+2+2+2+1)

Short notes:

(2x5=10)

10. ADA classification of Dental Casting Alloys. Describe in detail advantages and disadvantages of base metal alloys. (2+3)
11. Explain in detail various methods of trituration of amalgam and the setting reaction of amalgam. (3+2)

Brief notes:

(5x3=15)

12. Classify casting defects
13. Composition and uses of Gutta percha
14. Rake angle
15. Inlay casting wax
16. Gold foil

QP Code:

Reg. No.....

**Second Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
General & Dental pharmacology and therapeutics**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary

Essay:

(2x10=20)

1. Classify non-steroidal anti-inflammatory drugs. Mention the mechanism of action, adverse effects, and therapeutic uses of aspirin. (4+2+2+2)
2. Classify fluoroquinolones. Enumerate the mechanism of action, adverse effects, and therapeutic uses of ciprofloxacin. (4+2+2+2)

Short notes

(4x5=20)

3. Classify the local anaesthetics. Explain the mechanism of action of lignocaine (3+2)
4. Classify diuretics and mention the mechanism of action of loop diuretics (3+2)
5. Classify oral hypoglycaemic agents. Mention the mechanism of action and adverse effects of glibenclamide. (3+2)
6. Classify antiseptics and mention its therapeutic applications. (3+2)

Brief notes:

(10x3=30)

7. Therapeutic uses of digoxin.
8. Therapeutic uses and contraindications of adrenaline.
9. Intravenous general anaesthetics
10. Explain briefly about the drugs used in helicobacter pylori therapy
11. Oral iron preparations
12. Mention four calcium channel blockers and its therapeutic uses
13. Explain about the local haemostatics
14. Explain the therapeutic uses of cotrimoxazole
15. Explain briefly on dentifrices
16. Mention the drugs used in insomnia and explain the mechanism of action

Reg. No.....

**First Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
General Pathology and General Microbiology**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary
- Write **section A** and **section B** in separate answer books (32 pages). Do not mix up questions from section A and section B

QP Code: Section: A General Pathology Max Marks: 35

Essay: (10)

1. Define inflammation. Enumerate the chemical mediators of inflammation. Discuss the cellular events in acute inflammation. (2+3+5)

Short notes: (2x5=10)

2. Classify anemia. Discuss the peripheral smear picture in iron deficiency anemia. (2+3)
3. Describe healing by primary intention with the help of a diagram. Mention four complications of wound healing. (4+1)

Brief notes: (5x3=15)

4. Pathologic classification
5. Septic shock
6. Giant cell tumor
7. Metastatic cascade
8. Actinomycosis

QP Code: Section: B General Microbiology Max Marks: 35

Essay: (10)

9. Define and classify sterilization. Describe moist heat sterilization (2+3+5)

Short notes: (2x5=10)

10. Describe the pathogenesis and laboratory diagnosis of Syphilis. (2+3)
11. Define hypersensitivity and types of Hypersensitivity reaction. Describe the mechanism of anaphylaxis. (1+2+2)

Brief notes: (5x3=15)

12. Candidiasis
13. Laboratory diagnosis of Diphtheria
14. Classical compliment pathway
15. Drug resistance
16. Laboratory diagnosis of HIV

QP Code:

Reg. No.....

Third Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Oral pathology and Microbiology

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary

Essay:

(2x10=20)

1. Classify odontogenic tumors. Discuss the clinical & radiographic features & histopathology of ameloblastoma. (3+2+1+4)
2. Define Dental Caries. Describe the types & histopathology of dentinal caries. (2+4+4)

Short notes

(4x5=20)

3. What is amelogenesis imperfecta. Discuss the causes of enamel hypoplasia. (1+4)
4. Grading and histopathology of oral squamous cell carcinoma. (1+4)
5. Discuss the radiographic features and histopathology of dentigerous cyst. (2+3)
6. Age estimation (5)

Brief notes:

(10x3=30)

7. Actinomycosis
8. Dysplasia
9. Oral thrush
10. Tzanck cells
11. Focal infection
12. Clinical features of Pagets disease
13. Histopathology of lichen planus
14. Investigation of sjogren syndrome
15. Radiographic features of osteosarcoma
16. Hemophilia

QP Code:

Reg. No.....

**Third Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
General Medicine**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary

Essay:

(2x10=20)

1. Discuss the etiology, clinical manifestations, investigations and treatment of thyrotoxicosis. (2+5+2+1)
2. Define heart failure. Discuss the etiology, pathogenesis, clinical manifestations, diagnosis and treatment of heart failure. (1+2+1+3+2+1)

Short notes

(4x5=20)

3. Discuss the clinical features, diagnosis and treatment of lung abscess. (2+2+1)
4. Discuss the etiology, clinical features, investigations and treatment of acute adrenal insufficiency. (1+2+1+1)
5. Discuss the classification & diagnosis of diabetes mellitus and mention the oral hypoglycemic agents in brief. (1+2+2)
6. Describe in detail the etiology, clinical features, investigations and treatment of enteric fever. (1+1+2+1)

Brief notes:

(10x3=30)

7. Migraine
8. Amoebiasis
9. Hypocalcaemia
10. Anticonvulsant drugs
11. Anaphylactic shock
12. Osteomalacia
13. Fallot's tetralogy
14. Nephrotic syndrome
15. Mumps
16. Sleep apnea

QP Code:

Reg. No.....

**Third Year BDS Degree Examinations - Month Year
New Scheme (2016 admission onwards)
General Surgery**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary

Essay:

(2x10=20)

1. Classify salivary tumors. Discuss the pathology, clinical features, investigations and treatment of pleomorphic adenoma. (3+2+3+1+1)
2. Classify shock. Discuss the clinical features and management of septic shock (2+5+3)

Short notes

(4x5=20)

3. What is reactionary haemorrhage and how do you manage it. Mention the indications and complications of massive blood transfusion (2+1+2)
4. Classify wounds. Discuss the management of wounds (3+2)
5. Discuss the pathology, investigations and treatment of tuberculous cervical lymphadenitis (2+1+2)
6. Discuss briefly the development, arterial supply and venous drainage of thyroid gland. (3+2)

Brief notes:

(10x3=30)

7. Ranula
8. Brachytherapy
9. Robert Koch
10. Fine needle aspiration cytology
11. Sternomastoid tumor
12. Branchial cyst
13. Keloid
14. Medullary carcinoma of thyroid
15. Ludwig's angina
16. Informed consent

QP Code:

Reg. No.....

**Final Year BDS (Part I) Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Public Health Dentistry**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary

Essay:

(2x10=20)

1. Define health education. Add a note on principles and approaches in health education (2+4+4)
2. Define water fluoridation. Enumerate and describe in detail various systemic fluoridation methods. (3+7)

Short notes:

(4x5=20)

3. Changing concepts in public health
4. Biomedical waste management
5. Define primary health care. Add a note on principles of primary health care.
6. Describe prevention of dental caries based on levels of prevention.

Brief notes:

(10x3=30)

7. Turku sugar study
8. WHO index age groups and its significance.
9. Prevention and management of pressure sores.
10. Principles of ethics
11. Mobile dental van
12. Normal curve
13. Management of oral conditions in chronic/terminal illness
14. School Dental Nurse
15. Balanced diet
16. Percentile

QP Code:

Reg. No.....

Final Year BDS (Part I) Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Periodontology

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary

Essay:

(2x10=20)

1. Define localized aggressive periodontitis. Explain the clinical features, radiographic features and treatment of localized aggressive periodontitis. (1+2+2+5)
2. Classify bone grafts. Explain in detail the various bone graft materials used in periodontics. (3+7)

Short notes:

(4x5=20)

3. Explain the procedure of external bevel gingivectomy.
4. Classify periodontal pocket. Briefly describe the signs and symptoms of periodontal pocket.
5. Free gingival autograft.
6. Treatment of Class II furcation involvement.

Brief notes:

(10x3=30)

7. Radius of action.
8. Factors determining the probing depth.
9. Steps in Resective osseous surgery.
10. DNA probe.
11. Plaque hypotheses.
12. Stages of gingivitis.
13. Pericoronitis.
14. Interdental cleansing aids.
15. Chlorhexidine.
16. Pyogenic granuloma.

QP Code:

Reg. No.....

**Final Year BDS (Part I) Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Orthodontics and Dentofacial Orthopedics**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary

Essay:

(2x10=20)

1. Define interceptive orthodontics. Enumerate various interceptive orthodontic procedures. Discuss serial extraction in detail. (2+2+6)
2. An 11 year old girl was brought to your clinic by her mother complaining of protruded upper teeth, on examination there was convex profile, incompetent lips and increased overjet. Cephalometric findings showed an SNA of 83, ANB of 6 degree and FMA of 26 degrees. What is your diagnosis? Write a note on treatment plan and elaborate on mechanotherapy. (3 +2+ 5)

Short notes:

(4x5=20)

3. Methods to reinforce anchorage
4. CVMI
5. Therapeutic extractions
6. Merits and demerits of Angle's Classification

Brief notes:

(10x3=30)

7. EH Angle
8. Six keys to normal occlusion
9. Moment to force ratio
10. Modifications of Adams Clasp
11. Rule of 10 in CLCP management
12. Twin study
13. Elements of Valid consent
14. Schools of retention
15. List essential diagnostic aids
16. VTO

QP Code:

Reg. No.....

**Final Year BDS (Part I) Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Oral Medicine & Radiology**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary

Essay:

(2x10=20)

1. Classify white lesions of oral cavity. Mention about etiopathogenesis, Clinical features, investigations and management of oral submucous fibrosis. (4+1+2+1+2)
2. Write in detail about faulty radiographs and methods of rectification of faults. (5+ 5)

Short notes:

(4x5=20)

3. Trigeminal neuralgia
4. Sialolithiasis
5. Bisecting angle technique
6. Latent image

Brief notes:

(10x3=30)

7. Vital staining
8. Penny test
9. Ely's cyst
10. Intensifying screens
11. James- Ramsey Hunt syndrome
12. Radiographic features of fibrous dysplasia
13. TNM staging for oral cancer
14. Dosimeters
15. Antifungal agents
16. Image receptors

QP Code:

Reg. No.....

**Final Year BDS (Part II) Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Prosthodontics**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary

Essay:

(2x10=20)

1. Define Centric Relation. Explain the various techniques for recording centric relation.
Describe the importance of centric relation in complete denture treatment. (2+5+3)
2. Classify Direct retainers. Explain in detail the parts of a circumferential clasp. Describe the functions of each component of the clasp. (3+3+4)

Short notes:

(4x5=20)

3. Define and Classify pontics. (1+4)
4. Describe the principles of tooth preparation.
5. Post insertion complaints of complete denture treatment.
6. Maxillofacial prosthetic materials.

Brief notes:

(10x3=30)

7. Obturator.
8. Indirect retention.
9. Combination syndrome.
10. Osseointegration.
11. Denture stomatitis.
12. Kennedy's Classification.
13. Colour coding in RPD designing.
14. Gingival retraction.
15. Digital impressions in prosthodontics.
16. Compensatory curves.

QP Code:

Reg. No.....

**Final Year BDS (Part II) Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Oral and Maxillofacial Surgery**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary

Essay:

(2x10=20)

1. Describe nerve conduction and mechanism of action of local anesthetics.
Enumerate theories of local anesthesia. Classify local anesthetics based on their action.
(2+2+3+3)
2. Classify mandibular fractures. Describe clinical features, diagnosis and management of displaced angle fracture.
(2+2+2+4)

Short notes:

(4x5=20)

3. Describe clinical features, diagnosis and management of trigeminal neuralgia
4. Discuss the importance of pre-anaesthetic evaluation before administration of general anaesthesia
5. Describe clinical features, diagnosis and management of pterygomandibular space infection
6. Describe landmarks and technique of infra orbital nerve block. Add a note on the possible complications of infra orbital nerve block.

Brief notes:

(10x3=30)

7. CPR
8. Principles of antimicrobial therapy in OMFS
9. Chronic oro-antral fistula
10. Genioplasty
11. Osteoradionecrosis
12. Dry Socket
13. Autoclave
14. Fine needle aspiration cytology
15. Trismus
16. Dental investigations in mass disaster incidents

QP Code:

Reg. No.....

**Final Year BDS (Part II) Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Pediatric and Preventive Dentistry**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary

Essay: (2x10=20)

1. What is the concept of a Dental Home? Define anticipatory guidance and chart out the anticipatory guidance of children age wise. (3+2+5)
2. Discuss the Ellis and Davey classification of dental trauma. Explain the emergency oral soft tissue injury management and management of fractured permanent incisors without pulp exposure. (3+3+4)

Short notes: (4x5=20)

3. List out the various fixed space regainers and explain briefly on Gerber space regainer.
4. Define defluoridation. Outline the types of defluoridation techniques
5. Explain in detail diet counseling in a child with ECC.
6. What are the clinical features of a child with Down syndrome. Outline dental management of this child in the clinic.

Brief notes: (10x3=30)

7. AAPD definition of dental neglect and role of dentist in child abuse
8. Stainless Steel Crowns- composition and types
9. Causes of delayed eruption of teeth
10. Uses of hypnodontics
11. Storage media for avulsed teeth
12. Causes of midline diastema
13. Primate space and Leeway space of Nance
14. Tongue blade Therapy
15. Frankl Rating Scale
16. Define oral habits. Management of a child with lip biting.

QP Code:

Reg. No.....

**Final Year BDS (Part II) Degree Examinations - Month Year
New Scheme (2016 admission onwards)
Conservative dentistry and Endodontics**

Time: 3hrs

Max Marks: 70

- Answer all questions
- Draw diagrams wherever necessary

Essay:

(2x10=20)

1. Define working length. Enumerate the methods of working length determination. Discuss in detail radiographic technique (2+3+5)
2. What are the methods of isolation of operating field. Discuss the significance of isolation with respect to the various materials used (6+4)

Short notes:

(4x5=20)

3. Rationale of endodontics
4. Principles of cast restorations
5. What re the principles of biomechanical preparation
6. Classify hand cutting instruments in operative dentistry. Discuss instrument formula

Brief notes:

(10x3=30)

7. Pulp polyp
8. Bevels
9. Standardisation of endodontic instruments
10. Retention form in amalgam
11. Cavity liners
12. Sodium hypochlorite
13. Thermal test
14. Flaps in surgical endodontics
15. Metal modified glass ionomer
16. Pins used with amalgam

SYLLABUS
for Courses affiliated to the
Kerala University of Health Sciences
Thrissur 680596



Master of Dental Surgery (MDS)
Oral and Maxillofacial Surgery
Course Code: 243
(2021-2022 Academic year onwards
Modified as per DCI MDS Course (3rd Amendment)
Regulations 2019)

2. COURSE CONTENT

2.1 Title of course:

MDS Oral and Maxillofacial Surgery

2.2 . Objectives of course

1. Goals

The goals of postgraduate training in various specialities are to train the BDS graduate who will:

- Practice respective specialty efficiently and effectively, backed by scientific knowledge and skill.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing professional education in the specialty and allied specialties irrespective of whether in teaching or practice.
- Willing to share the knowledge and skills with any learner, junior or a colleague.
- To develop the faculty for critical analysis and evaluation of various concepts and views, to adopt the most rational approach.

2. Objectives

The objective is to train a candidate so as to ensure higher competence in both general and special area of interest and prepare him for a career in teaching, research and specialty practice. A candidate must achieve a high degree of clinical proficiency in the subject matter and develop competence in research and its methodology as related to the field concerned. The above objectives are to be achieved by the time the candidate completes the course. The objectives may be considered as under –

1. Knowledge (Cognitive Domain)
2. Skills (Psychomotor Domain)
3. Human values, ethical practice and communication abilities.

2.1. Knowledge

- Demonstrate understanding of basic sciences relevant to the specialty.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problem within the specialty in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning treatment.
- Recognize conditions that may be outside the area of specialty/competence and to refer them to an appropriate specialist.
- Update knowledge by self-study and by attending courses, conferences and seminars relevant to specialty.
- Undertake audit; use information technology and carryout research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

2.2. Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.
- Acquire adequate skills and competence in performing various procedures as required in the specialty.

2.3. Human values, ethical practice and communication abilities

- Adopt ethical principles in all aspects of practice.
- Foster professional honesty and integrity.
- Deliver patient care, irrespective of social status, caste, creed, or religion of the patient.
- Develop communication skills, in particular skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

This branch deals with the diagnosis and surgical and adjunctive treatment of diseases, injuries and defects of the human facial skeleton and associated oral and facial structures.

2.5 Duration

The course shall be of **three years** duration. All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as full time candidates in an institution affiliated to and approved for Postgraduate studies by KUHS, observing the norms put forward by the DCI.

- i. There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgery or equivalent research experience.
- ii. No student shall be permitted to complete the course by attending more than 6 continuous years.
- iii. A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6 Subjects

The speciality of Oral & Maxillofacial Surgery deals with the diagnosis and management of the diseases of stomatognathic system, jaw bones, cranio-maxillofacial region, salivary glands and temporomandibular joints etc. Within this framework it also supports many vital organs like eye, oropharynx, nasopharynx and major blood vessels and nerves. The traumatic injuries of maxillofacial skeleton are independently managed by Oral & Maxillofacial Surgeons. Whenever there are orbital injuries the ophthalmologists are trained only to tackle injuries of the eye ball (globe) but if there are associated injuries of the orbital skeleton, the Maxillofacial Surgeon is involved in its reconstruction. Similarly, nasal bone fracture may be managed by ENT surgeons. Most of the time nasal bone fractures are associated with fractures of the maxilla, mandible and zygomatic bones which are being managed by Oral & Maxillofacial Surgeons. The maxillofacial facial injuries at times are associated with head injuries also. The Oral & maxillofacial

Surgeon is involved in the management of cleft lip & cleft palate, orthognathic surgery, micro vascular surgery, reconstructive and oncological surgical procedures of maxillofacial region. The speciality of Oral & Maxillofacial Surgery is a multi disciplinary speciality and needs close working in co-ordination with Neurosurgeons, Oncosurgeons, Ophthalmologists, ENT Surgeons and Plastic Surgeons. The Oral & Maxillofacial Surgeons, Ophthalmologist, ENT Surgeons, Plastic Surgeons, Neuro-Surgeons and Oncologists complement each other by performing Surgical Procedures with their respective expertise and knowledge thereby benefiting the patients and students of the respective specialities .The syllabus for the theory of Oral and Maxillofacial Surgery should cover the entire field of the subject and the following topics may be used as guidelines.

The program outlines addresses both the knowledge needed in Oral and Maxillofacial Surgery and allied medical specialties in its scope. A minimum of three years of formal training through a graded system of education as specified will equip the trainee with skill and knowledge at its completion to be able to practice basic oral and Maxillofacial surgeon competently and have the ability to intelligently pursue further apprenticeship towards advanced Maxillofacial surgery.

The topics are considered as under:-

- © Basic sciences
- © Oral and Maxillofacial surgery
- © Allied specialties

The concept of Healthcare Counseling shall be incorporated in all relevant areas.

Syllabus for MDS Part I

PAPER – I : APPLIED BASIC SCIENCES: Applied Anatomy, Physiology, Biochemistry, General and Oral Pathology and Microbiology, Pharmacology, Research Methodology and Biostatistics.

Applied Anatomy:

1. Surgical anatomy of the scalp, temple and face
2. Anatomy of the triangles of neck and deep structures of the neck
3. Cranial and facial bones and its surrounding soft tissues with its applied aspects in maxillofacial injuries.
4. Muscles of head and neck; chest , lower and upper extremities (in consideration to grafts/flaps)
5. Arterial supply, venous drainage and lymphatics of head and neck
6. Congenital abnormalities of the head and neck
7. Surgical anatomy of the cranial nerves
8. Anatomy of the tongue and its applied aspects
9. Surgical anatomy of the temporal and infratemporal regions
10. Anatomy and its applied aspects of salivary glands, pharynx, thyroid and parathyroid gland, larynx, trachea, esophagus
11. Tooth eruption, morphology, and occlusion.
12. Surgical anatomy of the nose.
13. The structure and function of the brain including surgical anatomy of intra cranial venous sinuses.
14. Autonomous nervous system of head and neck
15. Functional anatomy of mastication, deglutition, speech, respiration and circulation
16. Development of face, paranasal sinuses and associated structures and their anomalies
17. TMJ: surgical anatomy and function

Physiology:

1. Nervous system

Physiology of nerve conduction, pain pathway, sympathetic and parasympathetic nervous system, hypothalamus and mechanism of controlling body temperature

2. Blood

- Composition
- Haemostasis, various blood dyscrasias and management of patients with the same
- Hemorrhage and its control
- Capillary and lymphatic circulation.
- Blood grouping, transfusing procedures.

3. Digestive system

- Saliva - composition and functions of saliva
- Mastication, deglutition, digestion, assimilation
- Urine formation, normal and abnormal constituents

4. Respiration

- Control of ventilation, anoxia, asphyxia, artificial respiration
- Hypoxia – types and management

5. CardioVascular System

- Cardiac cycle,
- Shock
- Heart sounds,
- Blood pressure,
- Hypertension:

6. Endocrinology

- General endocrinal activity and disorder relating to thyroid gland,
- Parathyroid gland, adrenal gland, pituitary gland, pancreas and gonads:
- Metabolism of calcium

7. Nutrition

- General principles of a balanced diet, effect of dietary deficiency, protein energy malnutrition, Kwashiorkor, Marasmus.
- Fluid and Electrolytic balance in maintaining haemostasis and significance in minor and major surgical procedures.

Biochemistry:

- General principles governing the various biological activities of the body, such as osmotic pressure, electrolytes, dissociation, oxidation, reduction etc.
- General composition of the body
- Intermediary metabolism
- Carbohydrates, proteins, lipids, and their metabolism Nucleoproteins, nucleic acid and nucleotides and their metabolism
- Enzymes, vitamins and minerals
- Hormones
- Body and other fluids.
- Metabolism of inorganic elements.
- Detoxification in the body.
- Antimetabolites.

Pathology:

1. Inflammation –

- Repair and regeneration, necrosis and gangrene
- Role of component system in acute inflammation,
- Role of arachidonic acid and its metabolites in acute inflammation,
- Growth factors in acute inflammation
- Role of molecular events in cell growth and intercellular signaling cell surface receptors
- Role of NSAIDs in inflammation,
- Cellular changes in radiation injury and its manifestation:

2. Haemostasis

- Role of endothelium in thrombogenesis,
- Arterial and venous thrombi,
- Disseminated Intravascular coagulation

3. Shock:

- Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock
- Circulatory disturbances, ischemia, hyperemia, venous congestion, edema, infarction

4. Chromosomal abnormalities:

- Marfans Syndrome, Ehler's Danlos Syndrome, Fragile X- Syndrome

5. Hypersensitivity:

- Anaphylaxis, type 2 hypersensitivity, type 3 hyper sensitivity and cell mediated reaction and its clinical importance, systemic lupus erythematosus.
- Infection and infective granulomas.

6. Neoplasia:

- Classification of tumors.
- Carcinogenesis and carcinogens- chemical, viral and microbial
- Grading and staging of cancers, tumor Angiogenesis, Paraneoplastic syndrome, spread of tumors
- Characteristics of benign and malignant tumors

7. Others:

- Sex linked agammaglobulinemia.
- AIDS
- Management of immuno deficiency patients requiring surgical procedures
- De George Syndrome
- Ghons complex, post primary pulmonary tuberculosis – pathology and pathogenesis.

Oral Pathology:

- Developmental disturbances of oral and Para oral structures
- Regressive changes of teeth.
- Bacterial, viral and mycotic infections of oral cavity
- Dental caries,, diseases of pulp and periapical tissues
- Physical and chemical injuries of the oral cavity
- Oral manifestations of metabolic and endocrinal disturbances
- Diseases of jawbones and TMJ
- Diseases of blood and blood forming organs in relation to oral cavity
- Cysts of the oral cavity
- Salivary gland diseases
- Role of laboratory investigations in oral surgery

Microbiology:

- Immunity
- Knowledge of organisms commonly associated with diseases of oral cavity.
- Morphology cultural characteristics of strepto, staphylo, pneumo, gono, meningo, clostridium group of organisms, spirochetes, organisms of TB, leprosy, diphtheria, actinomycosis and moniliasis
- Hepatitis B and its prophylaxis
- Culture and sensitivity test
- Laboratory determinations
- Blood groups, blood matching, RBC and WBC count
- Bleeding and clotting time etc, smears and cultures,
- Urine analysis and cultures.

Applied Pharmacology and Therapeutics:

1. Definition of terminologies used
2. Dosage and mode of administration of drugs.
3. Action and fate of drugs in the body
4. Drug addiction, tolerance and hypersensitivity reactions.
5. Drugs acting on the CNS
6. General and local anesthetics, hypnotics, analeptics, and tranquilizers.
7. Chemo therapeutics and antibiotics
8. Analgesics and antipyretics
9. Antitubercular and antisyphilitic drugs.
10. Antiseptics, sialogogues and antisialogogues
11. Haematinics
12. Antidiabetics
13. Vitamins A, B-complex, C, D, E, K

Research Methodology

- . What is research methodology?
 - . Study Designs
 - . Epidemiological studies, Observations, Descriptive,

- . Cohort case control studies.
- . Experimental, Clinical trials (Randomized control),
- . Community trends (Nonrandomized)

Biostatistics:

- . Introduction, definition and branches of biostatistics
- . Collection of data, sampling, types, bias and errors
- . Compiling data-graphs and charts
- . Measures of central tendency (mean, median and mode), standard deviation, variability

B) Oral and Maxillofacial Surgery:

- Evolution of Maxillofacial surgery.
- Diagnosis, history taking, clinical examination, investigations.
- Informed consent/medico-legal issues.
- Concept of essential drugs and rational use of drugs.
- Communication skills with patients- understanding, clarity in communication, compassionate explanations and giving emotional support at the time of suffering and bereavement
- Principles of surgical audit – understanding the audit of process and outcome. Methods adopted for the same. Basic statistics.
- Principles of evidence based surgery- understanding journal based literature study; the value of textbook, reference book articles, value of review articles; original articles and their critical assessment, understanding the value of retrospective, prospective, randomized control and blinded studies, understanding the principles and the meaning of various Bio-statistical tests applied in these studies.
- Principles of surgery- developing a surgical diagnosis, basic necessities for surgery, aseptic technique, incisions, flap designs, tissue handling, hemostasis, dead space management, decontamination and debridement, suturing, edema control, patient general health and nutrition.
- Medical emergencies – Prevention and management of altered consciousness, hyper sensitivity reaction, chest discomfort, respiratory difficulty.
- Pre operative workup – Concept of fitness for surgery; basic medical work up; work up in special situation like diabetes, renal failure, cardiac and respiratory illness; risk stratification
- Surgical sutures, drains
- Post operative care- concept of recovery room care, Airway management, Assessment of Wakefulness, management of cardio vascular instability in this period, Criteria for shifting to the ward, pain management
- Wound management- Wound healing, factors influencing healing, basic surgical techniques, Properties of suture materials, appropriate use of sutures.
- Surgical Infections – Asepsis and antisepsis, Microbiological principles, Rational use of antibiotics, special infections like Synergistic Gangrene and Diabetic foot infection, Hepatitis and HIV infection and cross infection.
- Airway obstruction/management – Anatomy of the airway, principles of keeping the airway patent, mouth to mouth resuscitation, Oropharyngeal airway, endotracheal intubation, Cricothyroidectomy, Tracheostomy.
- Anesthesia – stages of Anesthesia, pharmacology of inhalation, intravenous and regional anesthetics, muscle relaxants.
- Facial pain; Facial palsy and nerve injuries.
- Pain control – acute and chronic pain, cancer and non-cancer pain, patient controlled analgesia
- General patient management – competence in physical assessment of patients of surgery, competence in evaluation of patients presenting with acute injury, particularly to maxillofacial region. Competence in the evaluation of management of patients for Anesthesia
- Clinical oral surgery – all aspects of dento alveolar surgery
- Pre-prosthetic surgery – A wide range of surgical reconstructive procedures involving their hard and soft tissues of the edentulous jaws.
- Temporomandibular joint disorders – TMJ disorders and their sequelae need expert evaluation, assessment and management. It is preferable to be familiar with diagnostic and therapeutic arthroscopic surgery procedures.
- Tissue grafting – Understanding of the biological mechanisms involved in autogenous and heterogeneous tissue grafting.

- Reconstructive oral and maxillofacial surgery – hard tissue and soft tissue reconstruction.
- Cyst and tumors of head and neck region and their management – including principles of tumor surgery, giant cell lesion of jaw bones, fibro osseous lesions of jaw.
- Neurological disorders of maxillofacial region-diagnosis and management of Trigeminal Neuralgia, MPDS, Bells palsy, Frey's Syndrome, Nerve injuries
- Maxillofacial trauma – basic principles of treatment, primary care, diagnosis and management of hard and soft tissue injuries, Comprehensive management including polytrauma patients
- Assessment of trauma-multiple injuries patient, closed abdominal and chest injuries, penetrating injuries, pelvic fractures, urological injuries, vascular injuries.
- Orthognathic surgery – The trainee must be familiar with the assessment and correcting of jaw deformities
- Laser surgery – The application of laser technology in the surgical treatment of lesions amenable to such therapy
- Distraction osteogenesis in maxillofacial region.
- Cryosurgeries – Principles, the application of cryosurgery in the surgical management of lesions amenable to such surgeries.
- Cleft lip and palate surgery- detailed knowledge of the development of the face, head and neck, diagnosis and treatment planning, Current concepts in the management of cleft lip and palate deformity, knowledge of nasal endoscopy and other diagnostic techniques in the evaluation of speech and hearing, concept of multi disciplinary team management.
- Aesthetic facial surgery – detailed knowledge of structures of face & neck including skin and underlying soft tissues, diagnosis and treatment planning of deformities and conditions affecting facial skin, underlying facial muscles, bone, eyelids, external ear etc., surgical management of post acne scarring, face lift, blepharoplasty, otoplasty, facial bone recountouring etc.
- Craniofacial surgery – basic knowledge of developmental anomalies of face, head and neck, basics concept in the diagnosis and planning of various head and neck anomalies including facial cleft, craniosynostosis, syndromes, etc., Current concepts in the management of craniofacial anomalies.
- Head and neck oncology – understanding of the principles of management of head and neck oncology including various pre cancerous lesions, Experience in the surgical techniques of reconstruction following ablative surgery.
- Micro vascular surgery.
- Implantology – principles, surgical procedures for insertion of various types of implants.
- Maxillofacial radiology/ radio diagnosis
- Other diagnostic methods and imaging techniques

C) Allied Specialties:

- General medicine: General assessment of the patient including children with special emphasis on cardiovascular diseases, endocrinal, metabolic respiratory and renal diseases, Blood dyscrasias
- General surgery: Principles of general surgery, exposure to common general surgical procedures.
- Neuro – surgery: Evaluation of a patient with head injury, knowledge & exposure of various Neuro – surgical procedures
- ENT/Ophthalmology: Examination of ear, nose, throat, exposure to ENT surgical procedures, ophthalmic examination and evaluation, exposure to ophthalmic surgical procedures.
- Orthopedic: basic principles of orthopedic surgery, bone diseases and trauma as relevant to Maxillofacial surgery, interpretation of radiographs, CT, MRI and ultrasound
- Anesthesiology: Evaluation of patients for GA technique, general anesthetic drugs use and complications, management of emergencies, various IV sedation techniques.
- Plastic Surgery- Basic Principles

TEACHING / LEARNING ACTIVITIES:

The post graduate is expected to complete the following at the end of :

I Year

Study of applied basic sciences including practicals (wherever necessary), basic computer sciences, exodontia, seminars on basic topics, selection of dissertation topic, library assignment topic, attending O.T, ward rounds, Medical Record keeping, Pre-clinical exercises, preparation of synopsis and its submission within the six months after admission to the university as per calendar of events.

Rotation and postings in other departments:

General medicine - 1 month
 General surgery - 1 month
 Ophthalmology - 15 days
 Neuro Surgery - 15 days
 ENT - 15 days
 Orthopedic - 15 days
 Plastic Surgery - 15 days
 Casualty - 15 days
 Anesthesia (ICU) - 15 days
 Radiology (CT, MRI, USG) - 15 days

II Year

- Minor oral surgery and higher surgical training
- Submission of library assignment
- Oncologyposting – 1 month

III Year

- Maxillofacial surgery
- Submission of dissertation to the university, six months before the final examination.

It is desirable to enter general surgical skills and operative procedures that are observed, assisted or performed in the log book in the format as given below:-

Sl.No	Procedure	Category	Number
1.	Injection I.M. and I.V.	PI	50, 20
2.	Minor suturing and removal of sutures	PI	N, A
3.	Incision & drainage of an abscess	PI	10
4.	Surgical extraction	PI	15
5.	Impacted teeth	PI, A	30, 20
6.	Pre prosthetic surgery - Corrective procedures ridge extension ridge reconstruction	PI A A	10 3 3
7.	OAF closure	PI, A	3, 2
8.	Cyst enucleation	PI, A	5, 5
9.	Mandibular fractures	PI, A	10, 10
10.	Peri-apical surgery	PI, A	5
11.	Infection management	PI, A	3, 3
12.	Biopsy procedures	PI, A	10, 3
13.	Removal of salivary calculi	A	3
14.	Benign tumors	PI, A	3, 3
15.	mid face fractures	PI, A	3, 5
16.	Implants	PI, A	5,5
17.	Tracheotomy	A	2
18.	Skin grafts	PI, A	2, 2
19.	Orthognathic surgery	A, O	3, 5
20.	Harvesting bone & cartilage grafts Iliac crest Rib Calvarial Fibula	A,O A,O A,O A,O	3,5 3,3 2,2 2,2
21.	T.M. Joint surgery	A	3
22.	Jaw resections	A, O	3, 5
23.	Onco surgery	A,O	3,3
24.	Micro vascular anastomosis	A, O	2, 2
25.	Cleft lip & palate	A, O	3, 5
26.	Distraction osteogenesis	A, O	2, 3

27.	Rhinoplasty	A, O	2,3
28.	Access osteotomies and base of skull surgeries	A, O	1, 3
29.	Emergency Management for OMFS Patients in Casualty / Accident & Emergency	PI, O	5. 5

PI:- Performed Independently

A:- Assisted

O:- Observed

Paper wise distribution of syllabus:

MDS PART- I :

Paper I : Applied Basic Sciences

MDS PART-II:

Paper– I:Minor Oral Surgery and Maxillofacial Trauma

Minor Oral Surgery:

- Principles of Surgery:** Developing A Surgical Diagnosis, Basic Necessities For Surgery, Aseptic Technique, Incisions, Flap Design Tissue Handling, Haemostasis, Dead Space Management, Decontamination And Debridement, Suturing, Oedema Control, Patient General Health And Nutrition.
- Medical Emergencies:** Prevention and management of altered consciousness (syncope, orthostatic hypotension, seizures, diabetes mellitus, adrenal insufficiency), hypersensitivity reactions, chest discomfort, and respiratory difficulty.
- Examination and Diagnosis:** Clinical history, physical and radiographic, clinical and laboratory diagnosis, oral manifestations of systemic diseases, implications of systemic diseases in surgical patients.
- Haemorrhage and Shock:** Applied physiology, clinical abnormalities of coagulation, extra vascular hemorrhage, and hemorrhagic lesions, management of secondary hemorrhage, shock.
- Exodontia:** Principles of extraction, indications and contraindications, types of extraction, complications and their management, principles of elevators and elevators used in oral surgery.
- Impaction:** Surgical anatomy, classification, indications and contraindications, diagnosis, procedures, complications and their management.
- Surgical aids to eruption of teeth:** Surgical exposure of unerupted teeth, surgical repositioning of partially erupted teeth.
- Transplantation of teeth**
- Surgical Endodontics:** Indications and contraindications, diagnosis, procedures of periradicular surgery
- Preprosthetic Surgery:** Requirements, types (alveoloplasty, tuberosity reduction, mylohyoid ridge reduction, genial reduction, removal of exostosis, vestibuloplasty)
- Procedures to Improve Alveolar Soft Tissues:** Hypermobile tissues- operative / sclerosing method, epulis fissuratum, frenectomy and frenotomy
- Infections of Head and Neck:** Odontogenic and non Odontogenic infections, factors affecting spread of infection, diagnosis and differential diagnosis, management of facial space infections, Ludwig angina, cavernous sinus thrombosis.
- Chronic infections of the jaws:** Osteomyelitis (types, etiology, pathogenesis, management)

osteoradionecrosis

- Maxillary Sinus:** Maxillary sinusitis – types, pathology, treatment, closure of Oro – antral fistula, Caldwell- luc operation
- Cysts of the Orofacial Region:** Classification, diagnosis, management of OKC, dentigerous, radicular, non Odontogenic, ranula

Neurological disorders of the Maxillofacial Region: Diagnosis and management of trigeminal neuralgia, MPDS, bell's palsy, Frey's syndrome, nerve injuries.

Implantology: Definition, classification, indications and contraindications, advantages and disadvantages, surgical procedure.

Anesthesia

Local Anesthesia: Classification of local anesthetic drugs, mode of action, indications and contra indications, advantages and disadvantages, techniques, complications and their management.

General Anesthesia: Classification, stages of GA, mechanism of action, indications, and contra indications, advantages and disadvantages, post anesthetic complications and emergencies, anesthetic for dental procedures in children, pre medication, conscious sedation, legal aspects for GA

Maxillofacial Trauma:

Surgical Anatomy of Head and Neck.

Etiology of Injury.

Basic Principles of Treatment

Primary Care: resuscitation, establishment of airway, management of hemorrhage, management of head injuries and admission to hospital.

Diagnosis: clinical, radiological

Soft Tissue Injury of Face and Scalp: classification and management of soft tissue wounds, injuries to structure requiring special treatment.

Dento Alveolar Fractures: examination and diagnosis, classification, treatment, prevention.

Mandibular Fractures: classification, examination and diagnosis, general principles of treatment, complications and their management

Fracture of Zygomatic Complex: classification, examination and diagnosis, general principles of treatment, complications and their management.

Orbital Fractures: blow out fractures

Nasal Fractures

Fractures of Middle Third of the Facial Skeleton: emergency care, fracture of maxilla, and treatment of le fort I, II, III, fractures of Nasoorbito ethmoidal region.

Ophthalmic Injuries: minor injuries, non-perforating injuries, perforating injuries, retro bulbar hemorrhage, and traumatic optic neuropathy.

Traumatic Injuries To Frontal Sinus: diagnosis, classification, treatment

- Maxillofacial Injuries in Geriatric and Pediatric Patients.
- Gun Shot Wounds and War Injuries
- Osseointegration in Maxillofacial Reconstruction
- Metabolic Response to Trauma: neuro endocrine responses, inflammatory mediators, clinical implications
- Healing of Traumatic Injuries: soft tissues, bone, cartilage, response of peripheral nerve to injury
- Nutritional consideration following Trauma.
- Tracheostomy: indications and contraindications, procedure, complications and their management.

Paper – II :Maxillofacial Surgery

a) Salivary gland

- Sialography
- Salivary fistula and management
- Diseases of salivary gland – developmental disturbances, cysts, inflammation and sialolithiasis
- Mucocele and Ranula
- Tumors of salivary gland and their management
- Staging of salivary gland tumors
- Parotidectomy

b) Temporomandibular Joint

- Etiology, history signs, symptoms, examination and diagnosis of temporomandibular joint disorders
- Ankylosis and management of the same with different treatment modalities
- MPDS and management
- Condylectomy – different procedures
- Various approaches to TMJ
- Recurrent dislocations – Etiology and Management

c) Oncology

- Biopsy
- Management of pre-malignant tumors of head and neck region
- Benign and Malignant tumors of Head and Neck region
- Staging of oral cancer and tumor markers
- Management of oral cancer
- Radical Neck dissection
- Modes of spread of tumors
- Diagnosis and management of tumors of nasal, paranasal, neck, tongue, cheek, maxilla and mandible
- Radiation therapy in maxillofacial regions
- Lateral neck swellings

d) Orthognathic surgery

- Diagnosis and treatment planning
- Cephalometric analysis
- Model surgery
- Maxillary and mandibular repositioning procedures
- Segmental osteotomies
- Management of apertognathia
- Genioplasty
- Distraction osteogenesis

e) Cysts and tumors of oro facial region

- Odontogenic and non-Odontogenic tumors and their management
- Giant Cell lesions of jawbone
- Fibro osseous lesions of jawbone
- Cysts of jaw

f) Laser surgery

- The application of laser technology in surgical treatment of lesions

g) Cryosurgery

- Principles, applications of cryosurgery in surgical management

h) Cleft lip and palate surgery

- Detailed knowledge of the development of the face, head and neck
- Diagnosis and treatment planning
- Current concepts in the management of cleft lip and palate deformity
- Knowledge of Naso endoscopy and other diagnostic techniques in the evaluation of speech and hearing
- Concept of multidisciplinary team management

i) Aesthetic facial surgery

- Detailed knowledge of the structures of the face and neck including skin and underlying soft tissue
- Diagnosis and treatment planning of deformities and conditions affecting facial skin
- Underlying facial muscles, bone, Eyelids, external ear
- Surgical management of post acne scarring, facelift, blepharoplasty, otoplasty, facial bone recontouring, etc

j) Craniofacial surgery

- Basic knowledge of developmental anomalies of the face, head and neck
- Basic concepts in the diagnosis and planning of various head and neck anomalies including facial clefts, craniosynostosis, syndromes, etc.
- Current concept in the management of Craniofacial anomalies

Paper – III : Essays (descriptive and analyzing type questions)

2.7 Total number of hours

As per the instruction given by the DCI.

2.8 Branches if any with definition

Oral and Maxillofacial Surgery

2.9 Teaching learning methods

Method of Training

The training of a postgraduate student shall be full time with graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, case demonstrations, clinics, journal review meetings, and clinical meetings. Every candidate shall be required to participate in the teaching and training programme of undergraduate students and interns. Training should include involvement in laboratory and experimental work, and research studies. Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with

other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

Based on the above guidelines for a structured training programme for postgraduate courses, the basic tenets of a successful postgraduate teaching programme, are detailed under the following heads.

- **Formal Lectures** by the faculty on varied subjects including general areas and systems. Both senior and junior faculty can do this. However, the number of these classes should be maintained at low levels to encourage self-learning.
- **Symposia / Seminars** form an integral part of PG learning. A monthly symposium will generate approximate 30-35 symposia / course. These symposia can include department faculty and HODs as chairpersons and maximum involvement of both students and faculty should be ensured.
- **Clinical Discussions** form the core of PG training and can be assigned to various clinical units on rotating basis. However other faculty could also actively participate in the discussion. The discussions must be 3-4/week. One suggestion is to score the performance of the candidate by a small panel of faculty and convey the scores to the candidate / PG at the end of the session.
- **Journal Club /Clinical Club** should be conducted at least once in a week in each postgraduate department. Journal clubs not only imparts new information but also trains the candidate to objectively assess and criticize various articles which come out and should be useful in ensuring evidence based dentistry.
- **Guest Lectures** can be integrated into the PG program at least once in a month. Even the retired faculty can be invited for delivering the lectures and will ensure imparting of greater wisdom to the candidates.
- **Orientation Classes** for newcomers should also be incorporated. These classes can even be assigned to junior faculty/senior PGs.

Clinical posting. Each PG student should work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by a specialist.

- **Clinico Pathological Conferences** should be held once a year involving the faculties of Oral Medicine and Radiology, Oral Pathology and concerned clinical department. The student should be encouraged to present the clinical details, radiological and histo- pathological interpretations and participation in the discussions.

- **Rotation postings in other departments** should be worked out by each department in order to bring in more integration between the speciality and allied fields.

- **Periodical Quiz** can be both informative and entertaining and should be

encouraged and planned.

- **Computer Training and Internet Applications** are now becoming a must for both faculty and students. These areas should be strengthened as a next step. There can be a sort of internet information club in the departments.
- **Conferences/CDEs** – All postgraduate students should be encouraged to attend conferences and CDEs. They should also be asked to present papers wherever appropriate and should be rewarded by assigning scores for them.
- **Publication of scientific papers** – It is desirable and advisable to have at least two publications in the State/National/International indexed dental journals.
- **Involvement in Teaching Activity** – PG students can be assigned the job of teaching the undergraduate students and these will definitely improve the teaching skills in the postgraduate students.

Examinations

Evaluation is a continuous process, which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned MDS programme. Evaluation is achieved by two processes

- 1) Formative or internal assessment
- 2) Summative or university examinations.

Formative evaluation is done through a series of tests and examinations conducted periodically by the institution. Summative evaluation is done by the university through examination conducted at the end of the specified course.

A candidate registered for MDS course must clear the final examination within six years of the date of admission. The examinations should be so organized that this shall be used as the mechanism to confirm that the candidate has acquired appropriate knowledge, skill and competence at the end of the training that he/she can act as a specialist and/or a medical teacher as per expectation. University examination will be held regularly by KUHS in April-May/October-November every year.

A candidate who wishes to study for MDS in a second specialty should have to take the full course of 3 years in that specialty and appear for examinations.

2.10 Content of each subject in each year

Present in clause 2.6

2.11 No: of hours per subject

Present in clause 2.6

2.12 Practical training

Present in clause 2.6

2.13 Records

Present in clause 221

2.14 Dissertation: As per Dissertation Regulations of KUHS

Every candidate pursuing MDS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation. The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

Every candidate shall submit to the University in the prescribed format a synopsis containing particulars of proposed dissertation work after obtaining ethical clearance from the Institutional Ethical Committee **within six months from the date of commencement of the course or before the dates notified by the University**. The synopsis shall be sent only through the Principal of the institution. Such synopsis will be reviewed and the dissertation topic will be registered by the university. No change in the dissertation topic or guide/co-guide shall be made without prior approval of the University. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects. The dissertation should be written under the following headings:

- i. Introduction
- ii. Aims and Objectives of the study
- iii. Review of Literature
- iv. Methodology
- v. Results
- vi. Discussion
- vii. Conclusion
- viii. Summary
- ix. References
- x. Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires, and other annexures. It should be neatly typed (font size 13-Times New Roman or font size 13-Cambria) in 1.5 line spacing on one side of the paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. (Refer KUHS website). The guide, co-guide if any, Head of the Department and the Head of the Institution shall certify the dissertation.

For uniformity, it was suggested that the colour of the hard bind of the dissertation for all branches of MDS course in the purview of KUHS shall be dark brown with letters of gold colour. The title, author, and year of study should also be imprinted or embossed on the spine of the book. **Three hard copies and one properly labeled soft copy in a CD (refer KUHS website) of the dissertation thus prepared shall be submitted to KUHS on the 29th month of commencement of the course / 31st Oct. of the 3rd academic year, whichever falls first.**

Dissertation should preferably be sent to a minimum of three reviewers / examiners / assessors, of which two shall be from outside the state and one from the affiliated colleges of KUHS. Consent for acceptance for evaluation of

dissertation should be obtained from the reviewer/examiner/assessor before the dissertation are despatched. Proforma for evaluation of dissertation should be sent along

with the copies of the dissertation to the reviewers appointed by the university. The proforma should contain all the assessment criteria with the clause – **Accepted/Accepted with modifications/Rejected** and reasons for rejection by the examiner. This proforma should be sent back to the University within two weeks / within the date specified after receipt of dissertation. The dissertation may be declared accepted if more than 50% of the reviewers (2 in the case of 3 reviewers) have accepted it. If modifications are to be made as specified, 3 hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted within 30 days to the University which may be sent back to the same examiner/s by the University for Acceptance after a fee has been levied from the candidate. If the dissertation has been rejected by more than 50% of the reviewers (2 in the case of 3 reviewers), the dissertation may be reviewed by an Expert Reviewing Committee comprising of not less than two subject experts, Dean (Research) of KUHS and Guide of the candidate provided the Guide requests for a review, after a fee has been levied from the candidate. If rejected by the Reviewing Committee, the candidate should take up a new topic and undergo all the procedures of submitting the synopsis, fees, IEC clearance, etc as prescribed by the University. The candidate who takes up the new topic can appear only for the subsequent examination.

Approval of dissertation work is an essential precondition for a candidate to appear in the MDS Part II University examination. Hall tickets for the Part II university examination should be issued to the candidate only if the dissertation has been accepted. A candidate whose dissertation has been accepted by the examiners and approved by the University, but who is declared to have failed at the final examination will be permitted to reappear at the subsequent MDS examination without having to prepare a dissertation.

Guide – The academic qualification and teaching experience required for recognition by the University as a guide for dissertation work is as laid down by the Dental Council of India / KUHS.

Co-guide – A co-guide may be included provided the work requires substantial contribution from the same department or a sister department or from another institution recognized for teaching/training by KUHS/DCI. The co-guide should fulfill the academic qualification and teaching experience required for recognition by the University as a co-guide for dissertation work.

Change of Guide – In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

2.15 Speciality training if any

Present in clause 2.6

2.16 Project work to be done if any

Present in clause 2.6

2.17 Any other requirements [CME, Paper Publishing etc.]

Present in clause 2.6

2.18 Prescribed/recommended textbooks for each subject.

APPLIED BASIC SCIENCES

SUBJECT	NAME OF AUTHOR	NAME OF BOOK
Anatomy	BD Chaurasia	BD Chaurasia's Human Anatomy
	William, Peter L	Grays Anatomy
Oral Anatomy	Ash, Major M	Wheeler's Dental Anatomy, Physiology and Occlusion
	Sicher, Harry, Du Brull , Llyod	Oral Anatomy
Oral Histology	Bhaskar B.N. Ed	Orban's Oral Histology and Embryology Avery, James K
	Avery, James K	Essentials of Oral Histology and Embryology
Embryology	Sadler	Langman's Medical Embryology
	Inderbeer Singh	Human Embryology
Physiology	Guyton Arthur and John L Hall	Text Book of Medical Physiology
	Ganong, William F	Review of Medical Physiology
Pharmacology	KD Tripathi	Essentials of Medical Pharmacology
	Hardman, Joel G	Goodman and Gilman's pharmacological basis of Therapeutics
Nutrition	Nizel	Nutrition in Preventive Dentistry: Science and Practice
General Pathology	Cotran, Ramzi S and Others	Robbins Pathologic Basis of Disease
	Harsh Mohan	Textbook of Pathology
Oral Pathology	Shaffer, William and Others	Textbook of Oral Pathology
	Neville, Brad W and Others	Oral and Maxillofacial Pathology
Microbiology	Ananthanarayan and Panicker	Textbook of Microbiology
	Lakshman S	Essential Microbiology for Dentistry
Biostatistics	Dr. Symalan	Statistics in Medicine
	Soben Peter	Essentials of Preventive and Community Dentistry
	Sunder Rao and Richard J.	Introduction to Biostatistics and Research Methods

Oral and Maxillofacial Surgery

- Maxillofacial injuries L- Rowe & Williams
- Oral & Maxillofacial Trauma Raymond J Fonseca
- Surgery of the Mouth & Jaws JR. Moore
- Oral & Maxillofacial Surgery Vol I & II Daniel M. Laskin

- Oral & Maxillofacial infections Richard G. Topazion
- Dentofacial Deformities (Vol, II & III) Bruce N., Epker, L C. Fish
- Text book of Oral & Maxillofacial Surgery Neelima A. Malik
- Oral & Maxillofacial Surgery Raymond J Fonseca
- Oral Cancers McGregor
- Local Anesthesia Malamed
- Medical Emergencies Malamed
- Plastic Surgery Joseph J. McCarthy
- Surgical Orthodontics Hell, Profitt, Moore
- TMJ Disorders David A. Keith
- A Practical Guide to Hospital Dentistry George Varghese
- A Practical Guide to the Management of Impacted Teeth George Varghese
- Peterson's Principles of Oral & Maxillofacial Surgery Vol I & II Edited by G.E. Ghali
- Oral and Maxillofacial Surgery Vol I and II Peter Ward Booth
- Craniofacial Distraction Osteogenesis Samchukov
- Approaches to the Facial Skeleton Edward Ellis
- Oral Cancer Jatin Shah
- Medical Problems in Dentistry Scully and Cowson
- Anaesthesia R.D. Miller
- Wylie and Churchill Davidson's A Practice of Anaesthesia Healy, Knight, Lina
- Pain Bonca
- Local flaps in Facial Reconstruction Shah L. Baker
- Plastic Surgery (8vol) Joseph McCarthy
- ENT (7vol) Scott and Brown
- Surgical Correction of Facial Deformities Varghese Mani
- Head and Neck Surgery Stell and Maran
- Salivary Gland Disorders Carlson and Ord
- Contemporary Implant Dentistry Carl E. Misch
- Oral and Maxillofacial Surgery Secrets Abubaker
- Sedation- A Guide to Patient management Malamed
- Infection Control & Management of Hazardous Material Miller & C Palnik
- Clinical Review of Oral & Maxillofacial Surgery Bagheni
- Principles of Dental Suturing: A Complete Guide to Surgical Closure - Silverstein
- Craniomaxillofacial Reconstruction & Corrective Bone Surgery- Greenberg and Prin
- Bell's Orofacial Pain Oksan, Bell
- Osseointegration in Dentistry: An Overview Worthington, Lang
- Surgical Correction of Dentofacial Deformities- New Concepts William Bell
- Grab and Smith's Plastic Surgery William C. Grab
- Endoscopic Facial Plastic Surgery Gregory S. Keller
- Facial Paralysis: Rehabilitation

2.19 Reference books

As suggested by HOD

2.20 Journals

1 Journal of Oral & Maxillofacial Surgery

- 2 Journal of Craniofacial Surgery
- 3 British Journal of Oral & Maxillofacial Surgery
- 4 American Journal of Oral & Maxillofacial Surgery
- 5 Journal of Dental Research
- 6 Journal of American Dental Association.
- 7 Journal of Indian Dental Association.8 Journal foams
- 9 Oral and Maxillofacial Surgery Clinics of North America
- 10 Journal of Dentistry
- 11 International DentalJournal
- 12 Dental Clinics of NorthAmerica
- 13 Triple 'O' (Jr. of Oral Path., Oral medicine , Oral Surgery and Endodontics)
- 14 Quintessence International.

2.21 Logbooks

Work Diary/ Log Book

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/operations observed/assisted/performed by him/her during the training

period right from the point of entry and its authenticity shall be assessed weekly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, procedures and tests performed, seminars, journal club and other presentations.

Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. A work diary containing all the various treatment done by the candidate in the course of the study should also be maintained. The work diary shall be scrutinized and certified by both the guide/co guide and Head of the Department and presented in the University practical/clinical examination

3. EXAMINATIONS

3.1 Eligibility to appear for exams

Every candidate to become eligible to appear for the **MDS examination** shall fulfill the following requirements.

MDS Part I Examination

Attendance

Every candidate shall have fulfilled the attendance prescribed by the University(80%) during first academic year of the Postgraduate course.

Library Dissertation

Submission of library dissertation as per the regulations of KUHS is mandatory for a candidate to appear for the university examination.

MDS Part II (Final) Examination

Attendance

Every candidate shall have fulfilled the attendance prescribed by the University during **each academic year** of the Postgraduate course. A candidate becomes eligible for writing the University examination only after the completion of 36 months from the date of commencement of the course. The candidate should have completed the training period before the commencement of examination.

Dissertation

Approval of the dissertation is mandatory requirement for the candidate to appear for the Part II university examinations.

Pass in MDS Part I Examination

Every candidate shall have to pass the Part I examination to become eligible to appear for the Part II examination. The candidates shall have to pass the **Part-I** examination at least six months prior to the final (Part-II) examination.

Progress and Conduct

Every candidate shall have participated in seminars, journal review meetings, symposia, conferences, case presentations, clinics and didactic lectures during each year as designed by the concerned department.

Work Diary and Logbook

Every candidate shall maintain a work diary and logbook for recording his/her participation in the training programmes conducted by the department. The work diary and logbook shall be verified and certified by the Head of the department.

The certification of satisfactory progress by the Head of the Department and Head of the Institution shall be based on the checklist given in 5.1 to 5.8.

• Students should note that in case they do not complete the exercises and work allotted to them within the period prescribed, their course requirements will be considered unfulfilled.

• Clinical Records, Work Diaries and Logbooks should be maintained regularly and approved by the guide, duly certified by the Head of the Department.

3.2 Schedule of Regular/Supplementary exams

The MDS Part I examination shall be held at the end of the first academic year and the MDS Part II examination shall be held at the end of the third academic year. The university shall conduct two examinations in a year at an interval of four to six months between two examinations. **Not more than two examinations shall be conducted in an academic year.**

3.3 Scheme of examination showing maximum marks and minimum marks

The MDS examination shall consist of theory, practical / clinical examination and Viva-voce and Pedagogy

(i) **Theory:** There shall be two theory examinations for the MDS course,

Part I Examination – at the end of the first academic year

Part II Examination –at the end of the third academic year

Part-I Examination: Shall consist of one theory paper

There shall be a theory examination in the Basic Sciences of three hours duration at the end of the first academic year of the course. The question papers shall be set and evaluated by the faculty of the concerned speciality. The candidates shall have to secure a minimum of 50%marks in the Basic Sciences paper and shall have to pass the Part-I examination at least six months prior to the Part-II examination.

Part-II Examination: Shall consist of

(i) Theory - three papers, namely:–Paper I, Paper II & Paper III,each of three hours duration.

(ii) Practical and Clinical Examination;

(iii)Viva-voce and Pedagogy.

A candidate who wishes to study in a second speciality, shall have to undergo the full course of three years duration in that specialty.

Theory : (Total 400 Marks)

(1) Part I University Examination (100 Marks):-

There shall be 10 questions of 10 marks each (Total of 100 Marks)

(2) Part II (3 papers, each of 100 Marks):-

(i) Paper-I: 2 long essay questions of 25 marks each and 5 short essays of 10 marks each. (Total of 100 Marks)

(ii)Paper-II: 2 long essay questions of 25 marks each and 5 short essays of 10 marks each. (Total of 100 Marks)

(iii) Paper III: 2 out of 3 essay questions (2 x 50 = 100 Marks)

Practical and Clinical Examination: 200 Marks

Viva-voce and Pedagogy : 100 Marks

Written Examination (Theory) : 400 Marks

There shall be two theory examinations for the MDS course

Part-I: Basic Sciences Paper - **100 Marks**

The Part I examination consists of one theory paper in Basic Sciences, of three hours duration and shall be conducted at the end of the first academic year of the MDS course.

Part II (Final) examination:**300 Marks**

The Part II theory examination shall be conducted at the end of Third year of MDS course and consist of three papers, each of three hours duration. Each paper shall carry 100 marks. The type of questions in the first two papers will be two long essay questions carrying 25 marks each and five short essay questions each carrying ten marks. There will be no options in the questions in the first 2 papers. Third paper will be an essay question paper with three essay questions carrying 50 marks each and the candidate is to answer any two of the

essays. Questions on recent advances may be asked in any or all the papers. The syllabus for the theory papers of the concerned specialty should cover the entire field of the subject. Though the topics assigned to the different papers are generally evaluated under designated papers; a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics. The theory examinations shall be held sufficiently earlier than the practical/clinical examinations so that the answer books can be assessed and evaluated before the start of the practical/clinical examination. The total marks for the Part II theory examination shall be 300.

Practical Examination: 200 Marks

In case of practical examination, it should aim at assessing competence and skills of techniques and procedures. It should also aim at testing student's ability to make relevant and valid observations, interpretation and inference of laboratory or experimental or clinical work relating to his/her subject for undertaking independent work as a specialist. The total mark for practical/clinical examinations shall be 200.

Viva voce : 100 Marks

Viva voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The candidate may be given a topic for the pedagogy in the beginning of the clinical examination and asked to make a presentation on the topic for 8-10 minutes. The total marks shall be 100 of which 80 would be for the viva voce (20 marks/examiner) and 20 marks for the pedagogy.

3.4 Papers in each year

MDS Part I : Conducted at the end of the first academic year

Paper I : Applied Basic Sciences : Applied Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.

MDS Part II: Conducted at the end of the third academic year

Paper I : Minor Oral Surgery and Trauma

Paper II : Maxillo-facial Surgery

Paper III : Essay - Descriptive and analysing type question

3.5 Details of Theory Examination

The MDS course shall have **two theory examinations**,

(i) **Part I Examinaton**— consisting of one paper on Basic Sciences, of three hours duration, conducted at the end of the first academic year

Paper I : Applied Basic Sciences : Applied Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.

(ii) **Part II Examination** —consisting of three papers, Paper I, Paper II, Paper III, each of three hours duration, conducted at the end of the third academic year.

Paper I : Minor Oral Surgery and Trauma

Paper II : Maxillo-facial Surgery

Paper III : Essay - Descriptive and analysing type question

3.6 Model Question Papers

MDS Part I Examination

MDS Oral and Maxillofacial Surgery

Paper I : Applied Basic Sciences : Applied Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.

Time 3 Hours

Max. Marks 100

- Note: 1) Your answer should be specific to the questions
2) Draw neat labelled diagrams whenever necessary
3) Answer all questions

Essays

[10X10 = 100MARKS]

1. Discuss the lymphatic drainage of head and neck and its role in the spread of oral malignancies.
2. Discuss fluid and electrolyte balance in major maxillofacial surgeries
3. Healing of Fracture and factors controlling healing
4. Discuss the factors regulating blood pressure. Add a note on the physiologic responses to moderate hemorrhage
5. Keratocystic Odontogenic Tumor
6. Chemical mediators of inflammation
7. Saliva as a diagnostic aid
8. Principles of antibiotic therapy
9. Malpractice and negligence
10. Hepatitis B and its prophylaxis

MDS Part II Examination

MDS Oral and Maxillofacial Surgery

Paper- I – Minor Oral Surgery and Trauma

Time:3 Hours

Max. Marks :100

- Note:1)Your answer should be specific to the questions
2) Draw neat labeled diagrams wherever necessary
3) Answer all questions

Long essays

[2X25 = 50marks]

1. Classify odontogenic tumors. Discuss the options for the surgical management of ameloblastoma of maxilla.
 2. Classify condylar fractures of mandible. Discuss the management of displaced condylar fractures.
- Short essays** [5X10= 50marks]
3. Caldwell - Luc operation
 4. Retrobulbar hemorrhage
 5. Oroantral fistula
 6. Diplopia
 7. Frey's syndrome

MDS Part II Examination

MDS Oral and Maxillofacial Surgery

Paper- II - MAXILLOFACIAL SURGERY

Time 3 Hours

Max. Marks:100

- Note: 1) Your answer should be specific to the questions
2) Draw neat labeled diagrams wherever necessary
3) Answer all questions

Long essays

[2X 25 = 50marks]

1. How will you manage a case of bilateral TMJ ankylosis in an 8 year old boy? Discuss in detail the associated complications.
2. Discuss the pre-surgical evaluation and management of mandibular prognathism

Short essays

[5x 10=50marks]

3. Alveolar bone grafting
4. Cryosurgery
5. Arteriovenous malformation
6. Hemifacial macrosomia
7. Maxillectomy

MDS Part II Examination

MDS Oral and Maxillofacial Surgery

Paper- III – Essay-Recent advances in Maxillofacial Surgery

Time 3 Hours

Max. Marks : 100

- Note: 1) Your answer should be specific to the questions
2) Draw neat labeled diagrams wherever necessary
3) Answer any TWO questions

1. Craniofacial anomalies (50 marks)
2. Distraction osteogenesis (50 marks)
3. Preprosthetic surgeries (50 marks)

3.7 Internal assessment component

Not applicable.

3.8 Details of practical exams

Practical / Clinical Examination - 200 Marks

1. Minor Oral Surgery - 100 Marks

Each candidate is required to perform the minor oral surgical procedures under local anaesthesia. The minor surgical cases may include removal of impacted lower third molar, cyst enucleation, any similar procedure where students can exhibit their professional skills in raising the flap, removing the bone and suturing the wound.

2. Case presentation and discussion: 100 Marks

- (a) One long case - 60 Marks
- (b) Two short cases - 40 Marks (20 marks each)

C. Viva Voce - 100 Marks

i. Viva-Voce examination: 80 Marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It

includes presentation and discussion on dissertation also.

ii. Pedagogy: 20 Marks

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

Practical / Clinical examination (Total - 200marks)

i. Duration –Two days

ii. Time –9 am to 4 pm

Day I –

1. Minor Oral Surgery – impacted mandibular 3rd molar removal or any other surgical procedure under LA. - 100marks
2. Two Short cases discussion (2 x20marks) - 40marks
3. One long Case discussion - 60 marks

Day II-

1. Pedagogy presentation and discussion - 20 marks
2. **Viva-Voce examination:** 80 Marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills.

It includes all components of course contents. (20 x 4 =80 marks)

3.9 Number of examiners needed (Internal & External) and their qualifications

Part I Examination:

The University shall appoint one internal and one external examiner of the same specialty for evaluating the Part I answer scripts. The Part I answer papers shall be evaluated by external and internal examiners of the same speciality appointed by the University adhering to the evaluators guidelines of KUHS

Part II Examination

There shall be at least four examiners in each branch of study. Out of four, two (50%) should be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the DCI. The external examiners shall ordinarily be invited from another recognized University from outside the state. An external examiner may ordinarily be appointed for the same institute for not more than two years consecutively. Thereafter he may be reappointed after an interval of one year. The same set of examiners shall ordinarily be responsible for the practical and oral part of the examination.

The Head of the Department shall ordinarily be one of the examiners and the chairperson of the Board of Examinations; second internal examiner shall rotate after every two consecutive examinations if there are more than two postgraduate teachers in the department other than the Head of the department. No person who is not an active Postgraduate teacher in that subject can be appointed as Examiner. However in case of retired personnel, a teacher who satisfies the above conditions could be appointed as examiner up to one year after retirement.

For the MDS examination, if there are no two qualified internal examiners in an institute

the second internal examiner can be from a neighbouring DCI and KUHS approved / recognized Dental College having PG course in the specific speciality. This examiner should be an active PG teacher in the same speciality with the qualifications and experience recommended for a teacher for postgraduate degree programme. The examination can also be conducted by one qualified internal examiner and three qualified external examiners if there is no qualified second internal examiner. Reciprocal arrangement of Examiners should be discouraged, in that, the internal examiner in a subject should not accept external examinership of a college from which the external examiner is appointed in his subject in the same academic year.

3.10 Details of Viva Voce Total marks : 100

i.Viva-Voce examination :80 marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy = 20marks

4.INTERNSHIP

Not applicable for PG Courses

5.ANNEXURES

5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc.

Checklist 1

Model Checklist for Evaluation of Preclinical Exercises

Name of Student:

Date:

Name of the Faculty:

Name of Exercise:

Sl. No:	Items for observation during evaluation	Score
1	Quality of Exercise	
2	Ability to answer questions	
3	Punctuality in submission of exercise	
4	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty

5.2 :Checklist 2

Model Checklist for Evaluation of Journal Review / Seminar Presentation

Name of Student:

Date:

Name of the Faculty:

Name of Journal / Seminar:

Sl. No:	Items for observation during evaluation	Score
1	Relevance of Topic	
2	Appropriate Cross references	
3	Completeness of Preparation	
4	Ability to respond to questions	
5	Effectiveness of Audio-visual aids used	
6	Time Scheduling	
7	Clarity of Presentation	
8	Overall performance	
	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty

5.3 :Checklist 3

Model Checklist for Evaluation of Clinical Case and Clinical Work

Name of Student:

Date:

Name of the Faculty:

Sl. No:	Items for observation during evaluation	Score
1	History	
	Elicitation	
	Completeness	
2	Examination	
	General Examination	
	Extraoral examination	
	Intraoral examination	
3	Provisional Diagnosis	
4	Investigation	
	Complete and Relevant	
	Interpretation	
5	Diagnosis	
	Ability to defend diagnosis	
6	Differential Diagnosis	
	Ability to justify differential diagnosis	
7	Treatment Plan	
	Accuracy	
	Priority order	
8	Management	
9	Overall Observation	
	Chair side manners	
	Rapport with patient	
	Maintenance of Case Record	
	Quality of Clinical Work	
	Presentation of Completed Case	
10	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty

5.4 :Checklist 4

Model Checklist for Evaluation of Library Dissertation Work

Name of Student:

Date:

Name of the Faculty/Guide:

Sl. No:	Items for observation during evaluation	Score
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide	
7	Completeness of Preparation	
8	Ability to respond to questions	
9	Quality of final output	
	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty

5.5 :Checklist 5

Model Checklist for Evaluation of Dissertation Work

Name of Student:

Date:

Name of the Faculty/Guide/Co-guide:

Sl. No:	Items for observation during evaluation	Score
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide/co-guide	
7	Depth of analysis/Discuss	
8	Ability to respond to questions	
9	Department Presentation of findings	
10	Quality of final output	
	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty

5.6 : CHECKLIST- 6

CONTINUOUSEVALUATION OF DISSERTATION WORK BY GUIDE/CO-GUIDE

Name of the Trainee:

Date

Name of the Faculty

Sl.No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1	Periodic consultation with guide / co- guide					
2	Regular collection of case material					
3	Depth of Analysis / Discussion					
4	Department presentation of findings					
5	Quality of final output					
6	Others					
	TOTAL SCORE					

Signature of the guide / co-guide

5.7 : CHECKLIST - 7

OVERALL ASSESSMENT SHEET

Name of the College:

Date:

Name of Department:

Check List No	PARTICULARS	Name of trainee		
		First Year	Second Year	Third Year
1	Preclinical Exercises			
2	Journal Review Presentation			
3	Seminars			
4	Library dissertation			
5	Clinical work			
6	Clinical presentation			
7	Teaching skill practice			
8	Dissertation			
	TOTAL			

Signature of HOD

Signature of Principal

The above overall assessment sheet used along with the logbook should form the basis for certifying satisfactory completion of course of study, in addition to the attendance requirement.

Key:

Mean score: Is the sum of all the scores of checklists 1 to 6

5.8 : LOG BOOK

DEPARTMENT OF

MDS Programme

LOG BOOK OF

NAME.....

BIODATA OF THE CANDIDATE

EXPERIENCE BEFORE JOINING P.G. COURSE

DETAILS OF POSTING :

- FIRST YEAR
- SECOND YEAR
- THIRD YEAR

DETAILS OF LEAVE AVAILED

PRECLINICAL EXERCISES

LIBRARY DISSERTATION

RESEARCH WORK

PARTICIPATION IN CONFERENCES – CDE PROGRAMMES

DETAILS OF PARTICIPATION IN ACADEMIC PROGRAMME

SEMINARS /SYMPOSIA PRESENTED

JOURNAL CLUBS

TEACHING ASSIGNMENTS – UNDERGRADUATES / PARAMEDICAL.

SPECIAL DUTIES (IF ANY)

INTERNAL ASSESSMENT

Signature of the guide / co-guide

5.8.3 :LOG BOOK - 3

DIAGNOSTIC AND OPERATIVE PROCEDURES PERFORMED

Name

Admission Year:

College:

Date	Name	OP No.	Procedure	Category O, A, PA, PI

Key:

O- WASHED UP AND OBSERVED - INITIAL 6 MONTHS OF ADMISSION

A - ASSISTED A MORE SENIOR SURGEON -1 YEAR MDS

PA - PERFORMED PROCEDURE UNDER THE DIRECT SUPERVISION OF A SENIOR SURGEON - II YEAR MDS

PI - PERFORMED INDEPENDENTLY - III YEAR MDS

Signature of the guide / co-guide

Annexure : 5.9

Faculty

a. In each department there should be a minimum required full time faculty members belonging to the disciplines concerned with requisite postgraduate qualification and experience for being a PG teacher as prescribed by the DCI. The requirements of the faculty should follow the norms framed by the DCI.

b. To strengthen and maintain the standards of postgraduate training, DCI and KUHS recommends the following minimum faculty requirements (Table 1) for starting and continuation of postgraduate training programmes. Any increase of admissions will also be based on the same pattern.

Table 1: Minimum Faculty Requirements

Unit 1

1. Minimum faculty requirement of 1st Unit in an undergraduate institute having basic infrastructure of 50 admissions

Department / Speciality	Professor (HOD)	Readers/ Associate Professors	Lecturers/Assistant Professor
Prosthodontics and Crown & Bridge	1	3	4
Conservative Dentistry and Endodontics	1	3	4
Periodontology	1	2	2
Orthodontics & Dentofacial Orthopedics	1	2	2
Oral & Maxillofacial Surgery	1	2	2
Oral & Maxillofacial Pathology and Oral Microbiology	1	2	2
Oral Medicine & Radiology	1	2	2
Pediatric Dentistry	1	2	2
Public Health Dentistry	1	2	2

2. Minimum faculty requirement of 1st Unit in an undergraduate institute having basic infrastructure of 100 admissions

Department / Speciality	Professor (HOD)	Readers/ Associate Professors	Lecturers/Assistant Professor
Prosthodontics and Crown &	1	3	6

Bridge			
Conservative Dentistry and Endodontics	1	3	6
Periodontology	1	3	3
Orthodontics & Dentofacial Orthopedics	1	2	3
Oral & Maxillofacial Surgery	1	3	3
Oral & Maxillofacial Pathology and Oral Microbiology	1	2	3
Oral Medicine & Radiology	1	2	3
Pediatric Dentistry	1	2	3
Public Health Dentistry	1	2	3

3. Unit 2 :-

Each department shall have the following additional teaching faculty, over and above the requirement of Unit 1.

Professor	1
Reader /Associate Professor	1
Lecturer / Assistant Professor	2

- In addition to the faculty staff mentioned above there should be adequate strength of Senior Lecturers/ Lecturers available in the department. The department should also have adequate number of technical and other paramedical staff as prescribed by the Dental Council of India.
- A department which does not have a Professor and an Assistant Professor with requisite qualifications and experience as laid down by the DCI, shall not start a postgraduate course in that specialty.
- Faculty who is accepted as Postgraduate teacher in a dental institute starting MDS course will not be accepted for the next one year in any other dental institute.

Clinical / Laboratory Facilities and Equipments

There should be adequate clinical material, space and sufficient number of dental chairs and units, adequate laboratory facilities and should regularly be updated keeping in view the advancement of knowledge and technology and research requirements. The department should have the minimum number of all equipments including the latest ones necessary for the training and as recommended by the DCI/KUHS for each specialty from time to time.