

BACHELOR OF DENTAL SURGERY (B.D.S.)

DEGREE COURSE REGULATIONS

2nd Edition

Revised scheme

2016



JAGADGURU SRI SHIVARATHREESHWARA UNIVERSITY

JSS MEDICAL INSTITUTIONS CAMPUS, SHIVARATHREESHWARA NAGAR
MYSORE - 570 015, KARNATAKA

Phone : 0821- 2548393 & 2548400 Registrar : 2548392 Fax: 0821-2548394
e-mail : jssuni @jssonline.org, Web: <http://www.jssuni.edu.in>

INDEX

Sl. No.	Contents	Page Nos.
1	Section - I: Aims and objectives of BDS Course	
2	Section - II: Rules and Regulations	
3	Section III: Syllabus of study for BDS Courses I BDS: i) General Human Anatomy, Including Embryology, Osteology, Histology & Medical Genetics ii) General Human Physiology iii) Biochemistry iv) Dental Anatomy, Embryology and Oral Histology II BDS: v) General Pathology vi) Microbiology vii) General and Dental Pharmacology and Therapeutics viii) Dental Materials ix) Preclinical Conservative Dentistry x) Pre-Clinical Prosthodontics III BDS: xi) General Medicine xii) General Surgery xiii) Oral Pathology & Microbiology IV BDS: xiv) Oral Medicine and Radiology xv) Paedodontics and Preventive Dentistry xvi) Orthodontics & Dentofacial Orthopedics xvii) Periodontology xviii) Oral & Maxillofacial Surgery xix) Conservative Dentistry and Endodontics xx) Prosthodontics and Crown & Bridge xxi) Public Health Dentistry	
4	5 th year BDS – Internship	

SECTION – I: AIMS AND OBJECTIVES OF B.D.S. COURSE**AIMS**

The dental students 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 prevention, diagnosis and treatment of anomalies and diseases of the teeth, mouth, jaws and associated tissues. The students 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 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, principles of biological functions; ability 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 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 affects dentistry.

(B) SKILLS:

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

1. 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 treatment available wherever possible.
2. Prevent and manage complications if encountered while carrying out various surgical and other procedures.
3. Carry out certain investigative procedures and ability to interpret laboratory findings.
4. Promote oral health and help prevent oral diseases where possible.
5. Control pain and anxiety among the patients during dental treatment.

(C) ATTITUDES:

A graduate should develop during the training period the following attitudes

1. Willingness to apply the current knowledge of dentistry in the best interest of the patient and 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 CDE programmes to update knowledge and professional skill from time to time
5. Help and participate in the implementation of the national oral health policy.

SECTION II : RULES AND REGULATIONS

I. Admission to the Dental Course – Eligibility Criteria:

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

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

02. 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.

II. Selection of Students: The selection of students to dental college shall be based solely on merit of the candidate.

Procedure for selection to BDS course shall be as follows:-

- i. In case of admission on the basis of qualifying examination based on merit, candidate for admission to BDS course 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. 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 passing marks in English.
- ii. In case of admission on the basis of competitive entrance examination of this regulation, a candidate must have passed in 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 that 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 eligibility criteria as per above regulations.

III. Duration of the Course:

The undergraduate dental training programme leading to BDS degree shall be of 4 (Four) 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 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.

IV. Migration

A. Migration / Transfer of a student

- (1) Migration from one dental college to another 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 grounds, provided the 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 recognized 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 2nd 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 Institutions.
- (ii) All applications for migration shall be referred to Dental Council of India by the college authorities and migration will not be permitted without the prior approval of the council.

Note 2 :

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

B. Re- admission of candidates who discontinued the course:

A candidate who discontinues the course is eligible for re-admission subject to the following conditions.

1. Provision for re-admission is only once during the entire course.
2. He/She should seek readmission within three years from the date of discontinuation of the course.
3. He/She should pay the prescribed fees for the year for which he/she seeks admission and cannot claim readmission on the strength of fees paid earlier.
4. If the candidate discontinues after University Examination he/she should reappear for the subjects in which he/she failed before seeking admission to the next higher class by paying examination fee etc.

5. He/She should put in two terms of attendance in the class for which he/she seeks readmission before appearing for the University Examination.

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.
- (iii) The failed candidates shall put up a minimum of 75% attendance in failed subjects.

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 and 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.

EXAMINATIONS

I. PREAMBLE

A. 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 examinations 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 the respective subject and the average marks of these examinations should be considered. Ten percent of the total marks in each subject separately for theory and practical/clinical examination separately should be set aside for the internal assessment examinations.

SCHEME OF EXAMINATION:

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 and Final B.D.S. examination at the end of fourth year and 240 days minimum teaching in each academic year is mandatory.

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

Any candidate who fails in one subject in an Examination is permitted to go to the next higher class and appear for the said failed subject and completes it successfully before he/she is permitted to appear for the next higher examination.

I B.D.S. Examination:

- 1 General Human Anatomy including Embryology, Osteology, Histology and Medical Genetics
- 2 General Human Physiology and Biochemistry
- 3 Dental Anatomy, Embryology and Oral Histology

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.

III B.D.S. Examination:

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

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

IV B.D.S. Examination:

- 1 Oral Medicine and radiology
- 2 Paediatric & Preventive Dentistry
- 3 Orthodontics & dentofacial orthopaedics
- 4 Periodontology
- 5 Prosthodontics and Crown and Bridge
- 6 Conservative Dentistry and Endodontics
- 7 Oral Maxillofacial surgery
- 8 Public Health Dentistry

WRITTEN EXAMINATION:

- 1 The written examination in each subject shall consist of one paper of three hours duration and shall have maximum of 70 marks.
- 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 question such as essays, short essays, short answer / objective type or M.C.Q.'s.
- 4 The nature of question set will be aimed to evaluate students of different standards, ranging from average to excellent.
- 5 The questions will cover as broad an area of the content of the course. The essay questions will be properly structured and the marks specifically allotted.
- 6 The University may set up a question bank and paper setters shall be from the panel of External examiners. (Distribution of marks for paper setters in individual subjects as per table-IV, University Paper column)

PRACTICAL AND CLINICAL EXAMINATION:

1. **Objective Structured Clinical Evaluation:** 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 should be provided. This can include clinical procedures, laboratory experiments, spotters etc. Evaluation must be made objective and structured. The examiner bias because both the examiner and the examinee are given specific instructions on what is to be observed at each station.
2. **Scheme of clinical and practical examinations:** The specific scheme of clinical and practical examinations, the type of clinical procedure/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 on 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.
3. **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**Practicals / Clinical – 100**

University written exam	70	University Exam	90
Viva Voce	20	Internal assessment (Including marks for records)	10
Internal assessment (written)	10		
Total	100	Total	100

Practical and Viva Voce only in University Examinations

Pre-clinical Prosthodontics

Pre-clinical Conservative Dentistry

Internal Assessment

- 20 (Including 10 marks for records)

Practical

- 60

Viva Voce

- 20

100

Type of questions and distribution of marks

Each question paper shall be of 3 hours duration, carrying maximum marks of 70. There shall be four types of questions with distribution of marks as follows:

TABLE – I

Type of Questions	No.of Questions	Marks per question	Total marks
MCQ's	10	1	10
Long Essay type	2	10	20
Short Essay Type	4	5	20
Short Answer Type	10	2	20
		Grand Total	70

Note:

1. In the subject of General Human Physiology and Biochemistry, Section 'A' (Gen. Physiology) shall contain one Long essay type question carrying 10 marks and second question containing three short Essay type questions carrying five marks each, third question containing five short answer questions carrying two marks each. Section 'B' (Biochemistry) shall contain one Long essay type question of 10 marks and second question containing three short essay type question of five marks each, third question containing five short answer type questions carrying two marks each. As shown in table-II.

2. In the subject of Gen. Pathology, Section 'A' (Gen. Pathology) shall contain one long essay type question carrying 10 marks and second question shall contain three short essay type question carrying five marks each, third question containing five short answer questions of two marks each. Section 'B' (Microbiology) shall contain one long essay type question carrying 10 marks and second question shall contain three short essay type questions carrying five marks each, third question containing five short answer questions of two marks each. As shown in table-III

Note: In case of Physiology, Biochemistry, Pathology and Microbiology the distribution of marks and types of questions will be as follows:

TABLE-II

	Type of Questions	No.of question	Marks per question	Total Marks
PHYSIOLOGY	MCQ's	05	01	05
	Long Essay Type	01	10	10
	Short Essay Type	02	05	10
	Short Answer Type	05	02	10
			Gross Total	35
BIOCHEMISTRY	MCQ's	05	01	05
	Long Essay Type	01	10	10
	Short Essay Type	02	05	10
	Short Answer Type	05	02	10
			Gross Total	35

TABLE-III

	Type of Questions	No.of question	Marks per question	Total Marks
PATHOLOGY	MCQ's	05	01	05
	Long Essay Type	01	10	10
	Short Essay Type	02	05	10
	Short Answer Type	05	02	10
			Gross Total	35
MICROBIOLOGY	MCQ's	05	01	05
	Long Essay Type	01	10	10
	Short Essay Type	02	05	10
	Short Answer Type	05	02	10
			Gross Total	35

Distribution of marks in University examination and internal assessment for various subjects from first year to fifth year is shown in table IV.

TABLE-IV

Subjects	Theory				Practicals / Clinicals			Grand Total
	Internal Assessment	University Paper	Viva Voce	Total	Internal Assessment	Uni. Practical Exam.	Total	
I BDS 1. General Human Anatomy Including Embryology, Osteology, Histology and Medical Genetics	10	70	20	100	10	90	100	200
2. Section - A General Human Physiology	05	35	10	50	05	45	50	200
Section - B Biochemistry	05	35	10	50	05	45	50	
3. Dental Anatomy Embryology, and Oral Histology	10	70	20	100	10	90	100	200
II BDS 1. Section – A General Pathology	05	35	10	50	05	45	50	200
Section – B Microbiology	05	35	10	50	05	45	50	
2. Dental Pharmacology & Therapeutics	10	70	20	100	10	90	100	200
3. Dental Materials	10	70	20	100	10	90	100	200
4. Preclinical Conservative Dentistry	-	-	20	20	20	60	80	100
5. Preclinical prosthodontics	-	-	20	20	20	60	80	100
III BDS 1. General Medicine	10	70	20	100	10	90	100	200
2. General Surgery	10	70	20	100	10	90	100	200
3. Oral pathology & Microbiology	10	70	20	100	10	90	100	200
IV BDS 1. Oral Medicine & Radiology	10	70	20	100	10	90	100	200

2.Paediatric & Preventive Dentistry	10	70	20	100	10	90	100	200
3.Orthodontics & dental orthopaedics	10	70	20	100	10	90	100	200
4.Periodontology	10	70	20	100	10	90	100	200

Evaluation System:

i) Theory Exam: Theory papers shall be subjected for double evaluation one by the internal and the other by the external examiners, separately, Average of the two shall be considered as the total marks scored.

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 practical 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 examination, Viva Voce including internal assessment (*Theory*) combined together.
- In the University Practical/clinical examination, a candidate shall secure 50% of marks in Practical and Internal Assessment (*Practical*) 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.
- 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 rules.

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

Improvement of class: A maximum of 0.5% of total marks may be awarded as grace marks to a student to improve his/her class, even if he is a beneficiary under grace rule in a subject.

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 scripts 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. When double evaluation provision exists, this provision of re-evaluation will not be applicable.

Qualification and experience for eligibility for examinership in BDS examination

1. M.D.S. Degree from a recognized Institution.
2. Four 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/recognized by the Dental Council of India for B.D.S.
4. Reader or above in medical subjects involved in teaching dental institution.

Note:

1. In case of Public Health Dentistry one examiner from Public Health Dentistry and the second from Periodontics is permissible.
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.

Fifty percent of Examiners appointed shall be external from Dental Institutions approved/recognized by the Dental Council of India for B.D.S. Course, from another University, preferably 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 WORKING HOURS FOR EACH SUBJECT OF STUDY
(B.D.S. COURSE)
TABLE – IV**

Subjects	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General Human Anatomy Including Embryology, Osteology, Histology and Medical Genetics	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		90	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	460	805
Public Health Dentistry	60		200	260
Total	1590	1540	2160	3625

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

MINIMUM WORKING HOURS FOR EACH SUBJECT OF STUDY

(B.D.S. COURSE) I B.D.S. TABLE – V

Subjects	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General Human Anatomy Including Embryology, Osteology, Histology and Medical Genetics	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. TABLE – VI

Subjects	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General & Dental Pharmacology and therapeutics	70	20		90
General Pathology	55	55		110
Microbiology	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.
TABLE - VII**

Subjects	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General Medicine	60		90	150
General Surgery	60		90	150
Oral pathology & Oral Microbiology	120	80		200
Oral Medicine & Radiology	20		70	90
Paediatric & 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 & Crown & Bridge	30		70	100
Total	410		750	1160

**IV B.D.S.
TABLE - VIII**

Subjects	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
Prosthodontics & Crown & Bridge	80		300	380
Oral Medicine & Radiology	45		100	145
Periodontology	50		100	150
Public Health Dentistry	60		200	260
Conservative Dentistry & Endodontics	80		300	380
Oral & Maxillofacial Surgery	50		200	250
Orthodontics & Dentofacial orthopaedics	30		100	130
Paediatric & Preventive Dentistry	45		100	145
Total	280		1400	1840

Note:

- ❖ Behavioural Sciences Classes shall commence in 1st Year.
- ❖ Forensic odontology shall be covered in the department of Oral pathology and Oral Medicine during 3rd Year.
- ❖ Aesthetic Dentistry shall be covered in the Departments of Conservative Dentistry and Prosthodontics during 4th Year.
- ❖ Oral Implantology shall be covered in the Department of Maxillofacial Surgery, Prosthodontics & Crown & Bridge and Periodontology during 4th year
- ❖ Ethics and dental jurisprudence shall be covered in Public Health Dentistry in 4th year.

SECTION III : SYLLABUS OF STUDY FOR BDS COURSES**I B.D.S.****GENERAL HUMAN ANATOMY, INCLUDING EMBRYOLOGY, OSTEOLOGY, 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 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:

- 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.

C) COURSE CONTENT IN DETAIL**I. Theory : Minimum Teaching Hours: 100 Hrs.**

I. INTRODUCTION TO : <ul style="list-style-type: none"> • Anatomical terms • Skin, superficial fascia & deep fascia • Cardiovascular system, portal system collateral circulation and arteries • Lymphatic system, regional lymph nodes • Osteology - Including ossification & growth of bones • Myology – Including types of muscle tissue & innervations • Syndesmology – Including classification of Joints • Nervous system 	10 Hrs.
II. HEAD & NECK: <ul style="list-style-type: none"> • Scalp, face & temple, lacrimal apparatus • Neck - Deep fascia of neck, posterior triangle, suboccipital triangle, 	30 Hrs.

<p>anterior triangle, anterior median region of the neck, deep structures in the neck</p> <ul style="list-style-type: none"> • Cranial cavity - Meninges, parts of brain, ventricles of brain, dural venous sinuses, cranial nerves attached to the brain, pituitary gland • Cranial nerves - III, IV, V, VI, VII, IX, XII in detail • Orbital cavity – Muscles of the eye ball, supports of the eye ball, nerves and vessels in the orbit • Parotid gland • Temporo mandibular joint, muscles of mastication, infratemporal fossa, pterygo - palatine fossa • Submandibular region • Walls of the nasal cavity, paranasal air sinuses • Palate • Oral cavity, Tongue • Pharynx (palatine tonsil and the auditory tube) • Larynx • Vessels of head & neck -Carotid, subclavian arteries, Internal jugular vein • Cervical part of trachea and oesophagus 	
<p>III. OSTEOLOGY:</p> <ul style="list-style-type: none"> • Foetal skull • Adult skull • Individual bones of the skull • Hyoid bone and cervical vertebrae 	15 Hrs.
<p>III. THORAX : Demonstration on a dissected specimen of</p> <ul style="list-style-type: none"> • Thoracic wall • Heart chambers • Coronary arteries • Pericardium • Lungs – surfaces ; pleural cavity • Diaphragm 	02 Hrs.
<p>IV. ABDOMEN : Demonstration on a dissected specimen of</p> <ul style="list-style-type: none"> • Peritoneal cavity • Organs in the abdominal & pelvic cavity 	02 Hrs.

<p>V. CLINICAL PROCEDURES:</p> <p>a) Intramuscular injections: Demonstration on a dissected specimen and on a living person of the following sites of injection</p> <ul style="list-style-type: none"> • Deltoid muscle and its relation to the axillary nerve and radial nerve • Gluteal region and the relation of the sciatic nerve • Vastus lateralis muscle <p>b) Intravenous injections & venesection: Demonstration of veins in the dissected specimen and on a living person</p> <ul style="list-style-type: none"> • Median cubital vein • Cephalic vein • Basilic vein • Long saphenous vein <p>c) Arterial pulsations: Demonstration of arteries on a dissected specimen and feeling of pulsation of the following arteries on a living person</p> <ul style="list-style-type: none"> • Carotid • Axillary • Brachial • Radial • Ulnar • Femoral • Popliteal • Dorsalispedis <p>d) Lumbar puncture: Demonstration on a dissected specimen of the spinal cord, cauda equina & epidural space and the inter vertebral space between L4 & L5</p>	01 Hr.
<p>VI. NEURO ANATOMY :</p> <ul style="list-style-type: none"> • Detailed description of cranial nerves – V, VII, IX, X (in the region of head and neck) XI, XII including their nuclei of origin, intra and extra cranial courses • Cervical spinal nerves and cervical plexus. Autonomic nervous system of head and neck 	12 Hrs.

<p>VII. EMBRYOLOGY</p> <ul style="list-style-type: none"> • 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 	12 Hrs.
<p>VIII. HISTOLOGY :</p> <ul style="list-style-type: none"> • 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 	14 Hrs.
<p>IX. MEDICAL GENETICS</p> <ul style="list-style-type: none"> • Mitosis • Meiosis • Chromosomes • Gene structure • Mendelism • Modes of inheritance 	02 Hrs.

II. Practicals: 175 hours (2hours / practical)**a. Dissection Topics:**

1. Scalp
2. Face including deeper dissection
3. Posterior triangle of neck.
4. Anterior triangles of neck –
 - a. median region
 - b. digastric
 - c. Carotid triangles.
5. Deep dissection of neck –
 - a. Thyroid gland
 - b. Great vessels of neck.
6. Parotid region
7. Infra temporal fossa –
 - a. Muscles of mastication
 - b. Mandibular nerve and its branches
 - c. Maxillary artery
 - d. Temporo mandibular joint
8. Sub mandibular region – gland, hyoglossus and its relations
9. Mouth, palate and pharynx.
10. Nasal cavity and paranasal air sinuses
11. Tongue
12. Larynx

b. Surface Anatomy : (to be included in practicals only)

- Superior sagittal sinus
- Middle meningeal artery
- Pterion
- Facial artery
- Parotid gland and duct
- Facial nerve on face
- Common carotid arteries
- External carotid arteries
- Internal carotid arteries
- Palatine tonsil
- Vocal cards
- Thyroid gland
- Spinal accessory nerve

c. Radiological Anatomy :

AP & Lateral views of head and neck. Interpretation of normal radiological anatomy.

d. Histology Slides:

1. Epithelium – simple squamous (mesentry)
2. Epithelium – simple Cuboidal (thyroid)
3. Epithelium – simple Columnar (Gallblader)
4. Epithelium – simple Ciliated columnar
5. Epithelium – simple Pseudo – stratified ciliated columnar (Trachea)
6. Epithelium – simple Compound stratified squamous Keratinised (skin)
7. Epithelium – simple Compound stratified squamous non-Keratinised (oesophagus)
8. Compound – transitional (urinary bladder)
9. Areolar tissue.
10. Collagen fibres.
11. Elastic fibres.
12. Cartilage – hyaline
 - Elastic
 - White fibro
13. Bone – T.S.
 - L.S.
14. Muscle –Skeletal (LS/TS)
 - cardiac
 - smooth
15. Blood vessels – large sized artery
 - Medium sized artery
 - large vein
 - Medium vein
16. Peripheral nerve and ganglia
17. Serous salivary gland.
18. Mucous Salivary Gland.
19. Mixed Salivary Gland
20. Lymph node.
21. Palatine tonsil.
22. Thymus
23. Spleen
24. Skin – hairy
25. Skin – non hairy
26. Lip
27. Tooth
28. Tongue
29. Trachea
30. Oesophagus
31. Lung
32. Thyroid & parathyroid
33. Pituitary
34. Suprarenal gland
35. Pancreas

D) Scheme of Examination : General Human Anatomy, Including Embryology And Histology

1. Internal Assessment – i) Theory : 10 Marks
 ii) Practical : 10 Marks
 2. Theory : 70 Marks

Distribution of Topics and Type of Questions :

Contents	Type of Questions and Marks	Marks
Gross anatomy Applied anatomy General anatomy Osteology Embryology Histology	MCQ's 2 X 1 mark 1 X 1 mark 1 X 1 mark 2 X 1 mark 2 X 1 mark 2 X 1 mark	10
Gross Anatomy of Head and Neck – Scalp, Face, Triangles of Neck, Dural folds and Venous sinuses, contents of the Orbit excluding Eyeball, Parotid Gland, Infratemporal fossa, Temporomandibular joint, Submandibular region, Thyroid gland, Pharynx, Tongue, Nasal Cavity and Paranasal air sinuses, Cranial nerves – V, VII, IX and XII Development of Branchial apparatus, Face, Systemic Embryology and Systemic Histology	Long Essays 2 x 10 marks	20
Gross Anatomy of Head and Neck – Scalp, Face, Cervical fascia, Midline structures of the neck, Vertebral joints of neck, Contents of the Orbit excluding Eyeball, Vessels of Head and Neck, Infratemporal fossa, Mouth, Palate, Pharynx, Nasal cavity, Cervical part of Trachea and Oesophagus, Lymphatic drainage of Head and Neck.	Short Essays 4 x 5 marks	20
Cranial nerves – V, VII, IX , XI and XII and Cervical Plexus General and Systemic embryology and Histology, Osteology of Head and Neck	Short Essays 10 x 2 marks	20
	Total	70

3. Viva Voce : 20 Marks

- a. Osteology of Head and Neck 05 marks
 b. Soft part from Head and Neck 05 marks
 c. Embryology Models 05 marks
 d. Radiological Anatomy 05 marks

4. Practicals : 90 Marks**a. Gross Anatomy**

- | | |
|---|-------------------|
| a. Spotters carrying 2 marks each | 2 x 15 = 30 marks |
| b. Discussion on ONE given dissected specimen | 10 x 1 = 10 marks |
| c. Surface Anatomy | 10 x 1 = 10 marks |

b. Histology

- | | |
|---|-------------------|
| a. Identification of 10 slides of 02 mark each | 2 x 10 = 20 marks |
| b. Discussion on TWO given slides
(One General and one systemic) | 10 x 2 = 20 marks |

E) RECOMMENDED BOOKS: (Later Edition as and when Published)

1. Romanes(G.J.). Cunningham Manual of Practical Anatomy : Head & Neck & Brain, 15th Edition
2. McMinn. RJ Last's Anatomy, 11th Edition
3. A.K. Dutta. Essentials of Human Anatomy, 4th Edition
4. Sadler. Langman's Medical Embryology, 10th Edition
5. Inderbir singh. Text Book of Human Histology, 5th Edition
6. John V. Basmajian. Grant's Method of Anatomy, 11th Edition

REFERENCE BOOKS: (Later Edition as and when Published)

7. Snell (Richard s). Clinical Anatomy for Medical Students, 8th Edition.
8. Wheater, Burkitt & Daniels. Functional Histology, 5th Edition.
9. James E Anderson. Grant's Atlas of Anatomy, 12th Edition
10. William Drake. Gray's Anatomy, 39th Edition
11. Emery. Medical Genetics, 13th Edition
12. Inderbir singh. Human Embryology, 8th Edition
13. G.A.G. Decker. Lee. Mc Gregor's Synopsis of Surgical Anatomy, 12th Edition

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

a) KNOWLEDGE & UNDERSTANDING

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 Coordinated 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.

C) COURSE CONTENT IN DETAIL**I. Theory : Minimum Teaching Hours: 120 Hrs.**

<p>I. GENERAL PHYSIOLOGY</p> <ul style="list-style-type: none"> • Introduction to Physiology • Cell- Morphology - Functions of organelles: mitochondria, ribosome, Lysosomes: nucleus • Cell membrane & Transport across cell membrane • Body fluid compartments • Membrane potentials • Homeostasis – Basic concepts , Feedback mechanisms 	04 Hrs.
<p>II. BLOOD:</p> <ul style="list-style-type: none"> • Composition & functions of blood. Blood volume: Normal values, variations. Specific gravity, Packed cell volume, factors affecting & methods of determination. Plasma proteins - Types, concentration, functions & variations. • Erythrocytes Morphology, functions & variations. Erythropoiesis & factors affecting erythropoiesis. ESR- Determination, factors affecting, variations & significance. Hemoglobin - Normal concentration, Types method of determination, variation in concentration & functions. Blood Indices - MCV, MCH, MCHC - definition, normal values, variation. Anemia - Definition, classification, life span of RBC's destruction of RBC's , formation & fate of bile pigment s, Jaundice - types. • Leucocytes Classification, leucopoiesis, 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. • Tissue fluids & lymph 	15 Hrs.

Formation of tissue fluid, composition, circulation & functions of lymph. Edema - causes. Functions of tissue macrophage system.	
<p>III. MUSCLE AND NERVE</p> <ul style="list-style-type: none"> • Nerve Neurons - Morphology, classification, Nerve fibers classification, resting membrane potential, action potential, properties, conduction of impulses in myelinated & nonmyelinated fibers. Degeneration & Regeneration. • Neuromuscular transmission • Muscle Structure of skeletal muscle, EC Coupling, Molecular mechanism of muscle contraction, Types & Properties of skeletal muscle. • Structure and properties of cardiac muscle and smooth muscle. 	08 Hrs.
<p>IV. DIGESTIVE SYSTEM :</p> <ul style="list-style-type: none"> • Introduction to digestive system General structure of G.I. tract, Innervations. • 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& gallbladder Structure, composition of bile, functions of bile, regulation of secretion – Gall bladder: structure, functions. • Intestines Composition, functions & regulation of secretion of succus entericus, Absorptive Functions. Large intestine • Motor functions of GIT Mastication, deglutition, gastric filling & emptying, movements of small and large intestine, defecation. 	10 Hrs.
V. RENAL SYSTEM	08 Hrs.

<ul style="list-style-type: none"> • Structure & functions of urinary tract Functional unit of kidney & functions of different parts, Juxtaglomerular 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 & innervations of Urinary bladder, mechanism of micturition & abnormalities. 	
<p>VI. RESPIRATORY SYSTEM</p> <ul style="list-style-type: none"> • Physiological anatomy of respiratory passage & lungs. Physiology of Respiration : External & internal respiration • Mechanics of breathing Muscles of respiration, Mechanism of inflation & deflation of lungs. Intra pleural & intra pulmonary pressures & their changes during the phases of respiration, 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& transport 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. 	12 Hrs.

<p>VII. CARDIO VASCULAR SYSTEM</p> <ul style="list-style-type: none"> • Physiological anatomy and innervations 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. • Shock Types , physiological basis of signs & symptoms 	15 Hrs.
<p>VIII. ENDOCRINOLOGY</p> <ul style="list-style-type: none"> • General endocrinology Enumeration of endocrine glands & hormones – General functions of endocrine system, chemistry, mechanism of secretion, transport, metabolism, regulation of secretion of hormones. • Anterior pituitary Hormones & 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. 	14 Hrs.

<ul style="list-style-type: none"> • Adrenal cortex & Medulla Synthesis, secretion, action, metabolism, regulation of secretion of hormones & disorders. • Endocrine pancreas Hormones, actions, functions, regulation of secretion. Regulation of blood glucose level, diabetes mellitus. • Parathyroid Hormones, actions of hormones, regulation of secretion. Hypo & hyper parathyroid conditions, tetany-signs. Calcitonin – source, actions. Regulation of blood calcium level – Calcitriol. • Local hormones 	
<p>IX. REPRODUCTION</p> <ul style="list-style-type: none"> • Sex Determination & differentiation • Male reproductive system Physiological anatomy of male sex organs, spermatogenesis, Testosterone: Actions & regulation & semen. • Female reproductive system Menstrual cycle, functions of ovary, actions of estrogen & 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 and reflex. • Family Planning Methods: In the males: Coitus interruptus, condoms, vasectomy. In females: Rhythm method, Intra uterine Contraceptive Devise (IUCD), oral contraceptives, tubectomy. 	06 Hrs.
<p>X. CENTRAL NERVOUS SYSTEM</p> <ul style="list-style-type: none"> • Organisation of central nervous system, Synapse Types, events & properties • Sensory receptors Definition, classification, properties • Sensations Pathways for fine touch, pressure, proprioception, crude touch, thermal and pain sensations, Physiology of pain, referred pain, Trigeminal neuralgia • Motor system Neuronal organization at spinal cord level Reflex action : Definition, reflex arc, 	16 Hrs.

<p>classification, general properties</p> <ul style="list-style-type: none"> • Pyramidal tracts Origin, course, termination and functions. Signs of upper & lower motor neuron lesions. • Functions of cerebellum, Basal ganglia, thalamus, hypothalamus and cerebral cortex • Autonomic nervous system Organization & functions • CSF Formation , circulation, composition and functions of CSF 	
XI. BODY TEMPERATURE & FUNCTIONS OF SKIN	02 Hrs.
<p>XII .SPECIAL SENSES</p> <ul style="list-style-type: none"> • Vision Physiological anatomy of eye ball, functions of iris, aqueous humor, Lens, rods & cones. Accommodation to near vision. Refractive errors: Myopia, hypermetropia, presbyopia & astigmatism. Visual acuity, pupillary reflexes. Visual pathways, colour vision • Hearing Anatomic consideration, functions of outer, middle & inner ear, cochlea, organ of corti, mechanism of hearing. Auditory pathways, deafness - types & tests • Gustation Taste buds, primary taste sensation, pathway for taste sensation • Olfaction Receptors, olfactory pathways. 	10 Hrs.

II. Practicals: 60 Hrs. (2 hours / practical)

The following list of practical is minimum and essential. All the 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.

a. PROCEDURES

1. Study of Microscope & its uses.
2. Collection of blood
3. Enumeration of Red Blood Cells
4. Enumeration of White Blood Cells
5. Differential leukocyte counts
6. Determination of Hemoglobin and calculation of blood indices
7. Determination of blood group
8. Determination of bleeding time and clotting time
9. Examination of pulse
10. Recording of blood pressure.

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

D) SCHEME OF EXAMINATION

- | | | |
|------------------------------------|---|----------|
| 1. Internal Assessment – i) Theory | : | 05 Marks |
| ii) Practical | : | 05 Marks |
| 2. Theory | : | 35 Marks |

Distribution of Topics and Type of Questions:

Contents	Type of Questions and Marks	Marks
Nerve muscle physiology Special Senses	MCQ's 5 x 1 Mark	05
Long Essay Questions compulsorily from Blood Digestive system Cardio Vascular System Respiratory System Endocrinology Reproductive system	Long Essay 01 x 10 marks	10
All topics except topics of long essay	Short Essays 3 x 5 marks	15
All topics except topics of long essay	Short Answers 5 x 2 marks	10
	Total	35

3. Viva Voce	:	10 Marks
4. Practicals	:	45 Marks
A. Major Experiments (Any one)	:	30 Marks
a. R.B.C. Count		
b. W.B.C. Count		
c. Differential Count		
d. Blood Pressure Recording		
B. Minor Experiments (Any one)	:	15 Marks
a. Determination of Blood Groups		
b. Determination of Bleeding and Clotting time		
c. Hemoglobin Estimation		
d. Calculation of absolute Hematological Indices – MCV, MCH, MCHC & CI		

E) RECOMMENDED BOOKS: (Later Edition as and when Published) (Not in Preferential order)

- i) Vander. Human physiology: The mechanism of body function, 10th Edition 2001
- ii) A.K. Jain. Human Physiology for BDS students, 5th Edition 2014
- iii) Yogesh Tripathi . Concise Textbook of Physiology for dental students, 2nd edition 2011
- iv) Choudhari. Concise Medical Physiology, 6th Edition 2008
- v) G K Pal, Text book of Physiology for Dental students, 2nd edition 2016

REFERENCE BOOKS: (Later Edition as and when Published)

- i) Guyton. Text book of Physiology, 13th Edition 2016
- ii) Ganong. Review of Medical Physiology, 25th Edition 2015
- iii) Berne & Levy. Physiology, 6th Edition 2011
- iv) Best & Taylor's Physiological basis of Medical Practice, 13th Edition 2011

PRACTICAL BOOKS:

- i) A.K. Jain. Manual of Practical Physiology for BDS, 3rd Edition 2013
- ii) Ghai. A text book of practical physiology, 8th Edition 2013
- iii) Michael Swash. Hutchison's Clinical Methods, 23rd Edition 2013

BIOCHEMISTRY

A) 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 antivitamins, 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 cretinine 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 prolylhydroxylase. 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.

B) COURSE CONTENT IN DETAIL

I. Theory : Minimum Teaching Hours: 70 Hrs.

<p>I. CHEMISTRY OF BIOORGANIC MOLECULES</p> <ul style="list-style-type: none"> • Chemistry of Carbohydrates Definition, biological importance and classification. Monosaccharides - Isomerism, anomerism. Sugar derivatives, Disaccharides. Polysaccharides. Structures of starch glycogen and glycosoaminoglycans. • Chemistry of Proteins Biological importance. Aminoacids: Classification. Introduction to peptides. Proteins : Simple and conjugated; globular and fibrous. Charge properties. Buffer action Introduction to protein conformation . Denaturation. • Chemistry of Lipids Definition, biological importance and classification. Fats and fatty acids. Introduction to compound lipids. Hydrophobic and hydrophilic groups. Cholesterol. Bile salts. Micelle. Bimolecular leaflet, Lipoproteins – formation, function and turnover. • Chemistry of Nucleic acids Building units Nucleotides. Outline structure of DNA and RNA. High energy compounds: ATP , Phosphorylamidines, Thiolesters, Enol phosphates. 	16 Hrs.
<p>II. MACRONUTRIENTS AND DIGESTION</p> <ul style="list-style-type: none"> • 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 	03 Hrs.

<p>Enzymatic hydrolysis of dietary carbohydrates.</p> <ul style="list-style-type: none"> • Mechanism of uptake of monosaccharides. Digestion and absorption of triacylglycerols. Enzymatic hydrolysis of dietary proteins and uptake of amino acids. 	
<p>III. MICRONUTRIENTS</p> <ul style="list-style-type: none"> • 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. 	<p>07 Hrs.</p> <p>04 Hrs.</p>
<p>IV. ENERGY METABOLISM & ITS SPECIAL ASPECTS</p> <ul style="list-style-type: none"> • Metabolism of carbohydrates <ul style="list-style-type: none"> • Enzymatic hydrolysis of dietary carbohydrate • Mechanism of uptake of monosaccharides • Glycolysis, pyruvate oxidation, glycogenesis, glycogenolysis, gluconeogenesis, TCA cycle • Lactate metabolism, uronic acid pathway, importance of pentose phosphate pathway • Glycogen storage disorders, glucose-6-phosphate dehydrogenase deficiency, lysosomal storage disorders • Regulation of blood glucose • Diabetes mellitus & related disorders • Evaluation of glycaemic status • Metabolism of Proteins <ul style="list-style-type: none"> • Enzymatic hydrolysis of dietary proteins & uptake of amino acids, protein utilization for energy, ammonia metabolism, Urea formation, transmethylation, phosphocreatine formation • Amines, introduction to other amino acids including one carbon transfer • Inborn errors of amino acid metabolism (1 or 2 examples with biochemical basis) • Energy Metabolism & Special aspects: 	<p>18 Hrs.</p>

<ul style="list-style-type: none"> • Metabolism of Lipids - Fatty acids and synthesis (Lipogenesis), Lipolysis (β oxidation of fatty acids), Ketone body formation & utilization. • ETC & oxidative Phosphorylation 	
<p>V Detoxification – Typical reactions, examples of toxic compounds and Oxygen Toxicity</p>	
<p>VI. METABOLISM OF NUCLEIC ACIDS AND BIOCHEMICAL GENETICS</p> <ul style="list-style-type: none"> • 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. 	<p>06 Hrs.</p>
<p>VII. ENZYME AND METABOLIC REGULATION</p> <ul style="list-style-type: none"> • 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 and repression, Isoenzymes, Serum enzymes in diagnosis. • Overview of hormones Introduction to second messengers, cyclic AMP, calcium ion, inositol triphosphate. Mechanism of action of steroid hormones, epinephrine, glucagons and insulin in brief. Acid base regulation. Electrolyte balance. 	<p>04 Hrs.</p>
<p>VIII. STRUCTURAL COMPONENTS AND BLOOD PROTEINS</p> <ul style="list-style-type: none"> • 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 	<p>07 Hrs.</p>

<ul style="list-style-type: none"> • Functions of albumin • A brief account of immunoglobulins • Plasma lipoproteins: Formation, function and turnover 	
<p>IX. MEDICAL BIOCHEMISTRY</p> <ul style="list-style-type: none"> • Regulation of blood glucose • Diabetes mellitus and related disorders • Evaluation of glycemc 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 	05 Hrs.

II. Practicals: 60 hours (2 hours / practical)

a. Qualitative analysis

1. Qualitative analysis of carbohydrates
2. Color reactions of proteins and amino acids
3. Identification of nonprotein nitrogen substance*
4. Normal constituents of urine
5. Abnormal constituents of urine
6. Analysis of saliva including amylase *
7. Analysis of milk *

b. Quantitative estimations

8. Titrable acidity and ammonia in urine *
9. Free and total acidity in gastric juice *
10. Blood glucose estimation
11. Serum total protein estimation

12. Urine creatinine estimation

* Preferable to know under demonstration.

c. Demonstration

13. Electrophoresis charts/clinical data evaluation

14. Glucose tolerance test profiles

15. Serum lipid profiles

16. Profiles of hypothyroidism and hyperthyroidism

17. Profiles of hyper and hyperparathyroidism

18. Profiles of liver function

19. Urea, uric acid creatinine profile in kidney disorders

20. Blood gas profile in acidosis/ alkalosis

C) SCHEME OF EXAMINATION

1. Internal Assessment – i) Theory : 05 Marks

ii) Practical : 05 Marks

2.Theory : 35 Marks

Distribution of Topics and Type of Questions

Contents	Type of Questions and Marks	Marks
Transport across cell membrane Chemistry of Carbohydrates, proteins, lipids and nucleic acids	MCQ's 5 x 1 marks	05
Fat soluble and water soluble vitamins. Enzymes. Acid base balance and its disorders Metabolism of carbohydrates, proteins, lipids	Long Essays 1 x 10 marks	10
Chemistry and metabolism of : Carbohydrates, lipids, proteins, nucleic acids, Minerals, Enzymes Fat soluble and water soluble vitamins, Nutrition and dietetics, Detoxification Liver function tests, pH and its biological importance, Renal function tests, Blood constituents, Biological oxidation. Heme metabolism	Short Essays 2 x 5 marks	10
Chemistry and metabolism of: Carbohydrates, lipids, proteins, nucleic acids, Minerals, Enzymes Fat soluble and water soluble vitamins, Nutrition and	Short Answers 5 x 2 marks	10

dietetics, Detoxification, Liver function tests, pH and its biological importance, Renal function tests, Blood constituents Biological oxidation. Heme metabolism		
	Total	35

3. Viva Voce : **10 Marks**

4. Practicals : **45 Marks**

- a. One procedure for quantitative estimation : 20 marks
 b. One procedure for qualitative analysis : 15 marks
 c. Interpretation of Laboratory results in a given chart: 10 marks

The following are suggested:

a. Quantitative Estimation (Any ONE estimation to be done)

1. Estimation of Blood Glucose – using Folin –wu method, using deproteinized blood.
2. Determination of Creatinine in Urine – using Jaffe’s method
3. Estimation of serum total protein

b. Qualitative Analysis (Any ONE analysis to be done)

1. Identification of Carbohydrates – glucose, fructose, sucrose, lactose, maltose, starch.
2. Colour Reactions – albumin
3. Precipitation Reactions – albumin
4. Identification of Proteins – albumin, gelatin, casein, peptone
5. Urine Analysis – normal constituents
6. Urine Analysis – pathological constituents

c. Chart Interpretation (Interpretation of ONE Clinical chart)

1. Glucose Tolerance Test.
2. Values of Blood Constituents and their clinical variation : urea, cholesterol, calcium, phosphorus, bilirubin.

D) RECOMMENDED BOOKS: (Later Edition as and when Published)

1. Vasudevan. Text Book of Biochemistry for Dental Students,
2. T.N. Pattabiraman. Concise text book of Biochemistry, 3rd Edition.
3. S. Ramakrishnan and S.V. Rao. Nutritional Biochemistry,

REFERENCE BOOKS: (Later Edition as and when Published)

4. T.N. Devlin. Text book of Biochemistry with clinical correlations, 6th Edition.
5. R.K. Murray etal. Harper’s Biochemistry, 27th Edition.
6. R.A.D.Williams & J.C.Elliot. Basic and applied Dental Biochemistry, 2nd Edition.

DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY

A) GOAL

Dental anatomy, embryology and oral histology course includes instructions in the subject of Dental Morphology, Oral Embryology, Oral Histology and Oral Physiology. Introduction - Oral Biology - a composite of basic Dental Sciences & their clinical applications.

B) OBJECTIVES

After a course on Oral Biology,

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.

a. 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.

C) COURSE CONTENT IN DETAIL

I. Theory : Minimum Teaching Hours: 105 hrs.

<p>I. TOOTH MORPHOLOGY</p> <p>1. Introduction to tooth morphology:</p> <ul style="list-style-type: none"> • 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 	<p>40 Hrs.</p>
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<p>2. Morphology of permanent teeth : - 20 hrs.</p> <ul style="list-style-type: none"> • 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 	
<p>3. Morphology of Deciduous teeth : - 09 hrs.</p> <ul style="list-style-type: none"> • 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 	
<p>4. Occlusion: - 05 hrs.</p> <ul style="list-style-type: none"> • Definition • Factors influencing occlusion • Basal bone • Arches • 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 	
<p>II. ORAL EMBRYOLOGY</p> <p>1. Brief review of development of face, jaws, lip, palate & tongue, with applied aspects. - 02 hrs.</p> <p>2. Development of teeth : - 08 hrs.</p> <ul style="list-style-type: none"> • 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 <p>3. Eruption of deciduous & Permanent teeth :</p> <ul style="list-style-type: none"> • Mechanisms in tooth eruption • Different theories & histology of eruption 	10 Hrs.

<ul style="list-style-type: none"> • Formation of dentogingival junction • Role of gubernacular cord in eruption of permanent teeth • Clinical or Applied aspects of disorders of eruption <p>4. Shedding of teeth</p> <ul style="list-style-type: none"> • Factors & mechanisms of shedding of deciduous teeth • Complications of shedding 	
<p>III. ORAL HISTOLOGY</p> <ul style="list-style-type: none"> • Detailed microscopic study of <ul style="list-style-type: none"> • Enamel - 08 hrs. • Dentine - 06 hrs. • Cementum - 03 hrs. • Pulp tissue - 05 hrs. • 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 • Detailed microscopic study of <ul style="list-style-type: none"> • Periodontal ligament - 03 hrs. • Alveolar bone - 03 hrs. • Age changes, histological changes in periodontal ligament & bone in normal & orthodontic tooth movement, applied aspects of alveolar bone resorption • Detailed microscopic study of <ul style="list-style-type: none"> • 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 - 08 hrs. • Salivary Glands : Detailed microscopic study of acini & ductal system. Age changes & clinical considerations - 04 hrs. • TM Joint : Review of basic anatomical aspects & microscopic study & clinical considerations - 02 hrs. • Maxillary Sinus : Microscopic study, anatomical variations, functions & clinical relevance of maxillary sinus in dental practice - 03 hrs. • Processing of Hard & soft tissues for microscopic study : Ground sections, decalcified sections & routine staining procedures • Basic histochemical staining patterns of oral tissues 	<p>45 Hrs.</p>

IV. ORAL PHYSIOLOGY	10 Hrs.
<ul style="list-style-type: none"> • Saliva - 02 hrs. <ul style="list-style-type: none"> • 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 	
<ul style="list-style-type: none"> • Mastication - 01 hr. <ul style="list-style-type: none"> • Masticatory force & its measurement • Need for mastication • Peculiarities of masticatory muscles • Masticatory cycle • Masticatory reflexes • Neural control of mastication 	
<ul style="list-style-type: none"> • Deglutition - 01 hr. <ul style="list-style-type: none"> • Review of the steps in deglutition • Swallowing in infants • Neural control of deglutition • Dysphagia 	
<ul style="list-style-type: none"> • Calcium, Phosphorous & fluoride metabolism - 01 hr. <ul style="list-style-type: none"> • Source, requirements, absorption, distribution, functions & excretion, clinical considerations, hypo & hypercalcemia & hyper & hypo phosphatemia & fluorosis 	
<ul style="list-style-type: none"> • Theories of Mineralization - 02 hrs. <ul style="list-style-type: none"> • Definition, mechanisms, theories & their drawbacks • Applied aspects of physiology of mineralization, pathological considerations – calculus formation 	
<ul style="list-style-type: none"> • Physiology of Taste - 01 hr. <ul style="list-style-type: none"> • Innervation of taste buds & taste pathway • Physiologic basis of taste sensation • Age changes & applied aspects • Taste disorders 	

<ul style="list-style-type: none"> • Physiology of Speech - 02 hrs. <ul style="list-style-type: none"> • 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 	
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II. Practicals: Total : 250 Hrs.

<p>DENTAL ANATOMY</p> <p>Carving on wax blocks:- Cube, rectangle, cone and cylinder - 10 hrs</p> <p>Individual tooth – Only permanent teeth of both arches.</p> <p>Central & Lateral Incisors, Canines, Premolars and 1st molar - 100 hrs.</p> <p>Identification of individual teeth from extracted teeth specimen - 20 hrs.</p> <p>Identification of dentition using study models - 20 hrs.</p>	150 Hrs.
<p>HISTOLOGY</p> <p>Processing of hard and soft tissues for microscopic study - 06 hrs.</p> <p>Ground sections, decalcified sections and routine staining procedures</p> <p>Basic histochemical staining patterns of oral tissues.</p> <p>General histology of cells and tissues - 06 hrs.</p> <p>Special stained sections - 06 hrs.</p> <p>List of Histology slides:</p> <p>DEVELOPMENT OF TOOTH: - 10 hrs.</p> <ol style="list-style-type: none"> 1. Bud stage of tooth development. 2. Cap stage of tooth development 3. Early bell stage of tooth development. 4. Late Bell stage of tooth development. 5. Root formation. 	100 Hrs.

<p>ENAMEL :</p> <ol style="list-style-type: none"> 1. Enamel rod. 2. Hunter-Schreger Bands. 3. Tufts, Lamellae, Spindles. 4. Incremental lines of Retzius. 5. Neonatal line. 6. Gnarled Enamel. 	- 10 hrs.	
<p>DENTIN :</p> <ol style="list-style-type: none"> 1. Dentino – Enamel junction 2. Dentinal Tubules. 3. Incremental lines of Von Ebner 4. Contour lines of Owen. 5. Neonatal line. 6. Tomes granular layer. 7. Interglobular Dentin. 8. Secondary Dentin. 9. Intratubular Dentin 10. Intertubular Dentin. 	- 10 hrs.	
<p>CEMENTUM:</p> <ol style="list-style-type: none"> 1. Cellular cementum 2. Acellular cementum 3. Cemento enamel junction <ul style="list-style-type: none"> - Type 1 – 60% type – Overlapping - Type 2 – 30% type – Butt - Type 3 – 10% type – Cementum & Enamel do not meet. 4. Sharpey's fibers. 5. Hypercementosis. 	- 06 hrs.	
<p>PULP:</p> <ol style="list-style-type: none"> 1. Zones of Pulp 2. Pulp stones. 	- 06 hrs.	
<p>PERIODONTAL LIGAMENT:</p> <ol style="list-style-type: none"> 1. Principal fibers of Periodontal ligament <ul style="list-style-type: none"> - Apical, Horizontal, Oblique, Alveolar crest, Interradicular, Transeptal 	- 08 hrs.	
<p>ALVEOLAR BONE:</p> <ol style="list-style-type: none"> 1. Haversian system 2. Trabeculated bone. 3. Mature and immature bone. 	- 05 hrs.	

Dental Anatomy Oral Histology	Long Essays 1 X 10 marks 1 X 10 marks	20
Oral Histology Dental Anatomy Oral Physiology	Short Essays 2 X 5 marks 1 X 5 marks 1 X 5 marks	20
Oral Histology Dental Anatomy Oral Physiology Oral Embryology	Short Answers 3 X 2 marks 3 X 2 marks 3 X 2 marks 1 X 2 marks	20
	Total	70

3. Viva Voce : 20 Marks

4. Practicals : 90 Marks

1. Carving 30 marks 1 hour 15 min
2. Spotters 60 marks (20 spotter x 3 marks) 1 hour 15 min

- 10 histology and ground section slides
- 5 tooth identification
- 5 casts for identifications of teeth, numbering system and age assessment

E) RECOMMENDED TEXT BOOKS: (Later Edition as and when Published)

1. S.N.Bhaskar. Orban's Oral Histology & Embryology, 12TH Edition.
2. James & Avery. Oral Development & Histology, 31st Edition.
3. Major.M.Ash. Wheeler's Dental Anatomy, Physiology & Occlusion, 8th Edition.

REFERENCE BOOKS: (Later Edition as and when Published)

4. Woelfel & Scheid. Dental Anatomy - its relevance to dentistry, 7TH Edition.
5. Lavelle. Applied Physiology of the mouth, 2nd Edition.
6. Jenkins. Physiology & Biochemistry of the mouth

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

a) KNOWLEDGE & UNDERSTANDING

Enabling the student

1. To demonstrate and analyze pathological changes at macroscopic and microscopic levels and explain their observations in terms of disease processes.
2. To integrate knowledge from the basic sciences, clinical medicine and dentistry in the study of Pathology.

b) SKILLS

1. To demonstrate understanding of the capabilities and limitations of morphological Pathology in its contribution to medicine, dentistry and biological research.
2. To demonstrate ability to consult resource materials outside lectures, laboratory and tutorial classes.

C) COURSE CONTENT IN DETAIL – II BDS

1. Theory: Minimum Teaching Hours: 55 HOURS

A. General Pathology

1	INTRODUCTION TO PATHOLOGY <ul style="list-style-type: none"> • Terminologies • The cell in health • The normal cell structure • The cellular functions 	1 Hr
2	ETIOLOGY AND PATHOGENESIS OF DISEASE <ul style="list-style-type: none"> • Cell Injury • Types – Congenital - Acquired • Mainly Acquired causes of disease (Hypoxic injury, chemical injury, physical injury, immunological injury) 	2 Hrs.

<p>3 DEGENERATIONS</p> <ul style="list-style-type: none"> • Amyloidosis • Fatty change • Cloudy swelling • Hyaline change, mucoid degeneration 	2 Hrs.
<p>4 CELL DEATH & NECROSIS</p> <ul style="list-style-type: none"> • Apoptosis • Definition, causes, features and types of necrosis • Gangrene - Dry, wet, gas • Pathological Calcifications (Dystrophic and metastatic) 	2 Hrs.
<p>5 INFLAMMATION</p> <ul style="list-style-type: none"> • Definition, causes types, and features • Acute inflammation <ul style="list-style-type: none"> a. The vascular response b. The cellular response c. Chemical mediators d. The inflammatory cells e. Fate • Chronic inflammation • Granulomatous inflammation 	4 Hrs.
<p>6 HEALING</p> <ul style="list-style-type: none"> • Regeneration • Repair <ul style="list-style-type: none"> a. Mechanisms b. Healing by primary intention c. Healing by secondary intention d. Fracture healing e. Factors influencing healing process f. Complications 	2 Hrs.
<p>7 TUBERCULOSIS</p> <ul style="list-style-type: none"> • Epidemiology • Pathogenesis (Formation of tubercle) • Pathological features of Primary and secondary TB 	1 Hr

	<ul style="list-style-type: none"> • Complications and Fate 	
8	SYPHILIS <ul style="list-style-type: none"> • Epidemiology • Types and stages of syphilis • Pathological features • Diagnostic criteria • Oral lesions 	1 Hr
9	TYPHOID <ul style="list-style-type: none"> • Epidemiology • Pathogenesis • Pathological features • Diagnostic criteria 	1 Hr
10	THROMBOSIS <ul style="list-style-type: none"> • Definition, Pathophysiology • Formation, complications & Fate of a thrombus 	1 Hr
11	EMBOLISM <ul style="list-style-type: none"> • Definition • Types • Effects 	1 Hr
12	ISCHAEMIA AND INFARCTION <ul style="list-style-type: none"> • Definition, etiology, types • Infarction of various organs 	1 Hr
13	DERANGEMENTS OF BODY FLUIDS <ul style="list-style-type: none"> • Oedema – <ul style="list-style-type: none"> a) Pathogenesis b) Different types 	1 Hr
14	DISORDERS OF CIRCULATION	1 Hr

	<ul style="list-style-type: none"> • Hyperaemia • Shock 	
15	NUTRITIONAL DISORDERS <ul style="list-style-type: none"> • Common Vitamin Deficiencies 	3 Hrs.
16	IMMUNOLOGICAL MECHANISMS IN DISEASE <ul style="list-style-type: none"> • Humoral & cellular immunity • Hypersensitivity & autoimmunity 	1 Hr
17	AIDS AND HEPATITIS	2 Hrs.
18	HYPERTENSION <ul style="list-style-type: none"> • Definition, classification • Pathophysiology • Effects in various organs 	2 Hrs.
19	DIABETES MELLITUS <ul style="list-style-type: none"> • Definition, Classification, Pathogenesis, Pathology in different organs 	2 Hrs.
20	ADAPTIVE DISORDERS OF GROWTH <ul style="list-style-type: none"> • Atrophy & Hypertrophy, Hyperplasia, Metaplasia and Dysplasia 	3 Hrs.
21	GENERAL ASPECTS OF NEOPLASIA <ol style="list-style-type: none"> 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, Squamous papilloma & Carcinoma, Basal cell Carcinoma, Adenoma & Adenocarcinoma, Fibroma & Fibrosarcoma, Lipoma and liposarcoma 	4 Hrs.

B. Systemic Pathology

22	ANAEMIAS • Iron Deficiency anaemia, Megaloblastic anaemia	4 Hrs.
23	LEUKAEMIAS • Acute and chronic leukaemias, Diagnosis and clinical features	3 Hrs.
24	DISEASES OF LYMPH NODES • Hodgkin's disease, Non Hodgkins lymphoma, Metastatic carcinoma	
25	DISEASES OF ORAL CAVITY • Lichen planus, Stomatitis, Leukoplakia, Squamous cell carcinoma , Dental caries, Dentigerous cyst, Ameloblastoma	1 Hr
26	DISEASES OF SALIVARY GLANDS • Normal structure, Sialadenitis, Tumours	1 Hr
27	COMMON DISEASES OF BONES • Osteomyelitis, Metabolic bone diseases, Bone Tumours, Osteosarcoma, Osteoclastoma, Giant cell Tumour, Ewing's sarcoma, Fibrous dysplasia, Aneurysmal bone cyst	3 Hrs.
28	DISEASES OF CARDIOVASCULAR SYSTEM • Cardiac failure • Congenital heart disease – ASD, VSD,PDA • Fallot's Tetralogy • Infective Endocarditis • Atherosclerosis • Ischaemic heart Disease	3 Hrs.
29	HAEMORRHAGIC DISORDERS	2 Hrs.

<ul style="list-style-type: none"> • Coagulation cascade • Coagulation disorders <ul style="list-style-type: none"> - Platelet function - Platelet disorders 	
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II. Practical: 55 Hrs

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

D) SCHEME OF EXAMINATION**1. Internal Assessment : i) Theory : 05 Marks****ii) Practical : 05 Marks****2. Theory : 35 Marks****Distribution of Topics and Type of Questions**

Contents	Type of Questions and Marks	Marks
All topics MCQs	MCQ's 5X1 marks	5
Question from General Pathology Inflammation, Healing and Repair, Tuberculosis, Leprosy, Syphilis, Thrombosis, Diabetes Mellitus, Neoplasia.	Long Essay 1 x 10 marks	10
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. Haematology Clinical Pathology	Short Essays 2 x 5 marks	10
Two questions from Haematology Two questions from Clinical Pathology One from General Pathology	Short Answers 5 x 2 marks	10
	Total	35

3. Viva Voce : 10 Marks**4. Practicals : 45 Marks**

1. Spotters

Haematology slide	-	1 Mark
Histopathology slides	-	4 Marks
Specimens	-	3 Marks
Instruments	-	2 Marks

10 Marks

2. To examine given sample of urine for abnormal constituents - 10 Marks
3. To do differential count on the given peripheral blood smear - 10 Marks
4. To estimate haemoglobin percentage in the given sample of blood - 15 Marks

Or

To determine blood groups (ABO and Rh) in the given sample of blood

E) RECOMMENDED BOOKS

1. Cotran, Kumar, Robbins, – Pathologic Basis of Disease – 7th edition
2. Ivan Damjanov & James Linder, Anderson's Pathology Vol 1 & 2 – 10th edition
3. Mc Kanzee – Text Book of Haematology – 2nd edition
4. Lee, Bithell, Foerster, Athens Lukens. Wintrob's clinical Hematology 11th edition

MICROBIOLOGY

A) 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 feedback from the students.

B) OBJECTIVES

a) KNOWLEDGE & 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.

b) 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 IN DETAIL – II BDS**1. Theory: Minimum Teaching Hours: 65 Hours**

<p>1 GENERAL MICROBIOLOGY</p> <ul style="list-style-type: none"> • History, Introduction, Scope, Aims and Objectives. • Morphology and Physiology of bacteria. • Detail account of Sterilisation and Disinfection. • Brief account of Culture media and Culture techniques. • Basic knowledge of selection, collection, transport, processing of clinical Specimens and identification of bacteria. • Bacterial Genetics and Drug Resistance in bacteria. 	8 Hrs.
<p>2 IMMUNOLOGY</p> <ul style="list-style-type: none"> • Infection - Definition, Classification, Source, Mode of transmission and types of Infectious disease. • Immunity • Structure and functions of Immune system • The Complement System • Antigen • Immunoglobulins - Antibodies - General structure and the role played in defense mechanism of the body. • Immune response • Antigen - Antibody reactions - with reference to clinical utility. • Immunodeficiency disorders - a brief knowledge of various types of immuno deficiency disorders - A sound knowledge of immuno deficiency disorders relevant to dentistry. • Hypersensitivity reactions • Autoimmune disorders - Basic knowledge of various types - sound knowledge of autoimmune disorders of oral cavity and related structures. • Immunology of Transplantation 	14 Hrs.
<p>3 SYSTEMATIC BACTERIOLOGY</p> <ul style="list-style-type: none"> • 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. • Corynebacterium diphtheriae - mode of spread, important clinical feature, Laboratory diagnosis, Chemotherapy and Active immunisation. • Mycobacteria - Tuberculosis and Leprosy 	21 Hrs.

<ul style="list-style-type: none"> • Clostridium - Gas gangrene, food poisoning and tetanus. • Enterobacteriaceae • Vibrio cholerae • Pseudomonas • Haemophilus influenzae • Bordetella • Bacillus anthracis • Non-sporing Anaerobes - in brief about classification and morphology, in detail about dental pathogens - mechanism of disease production and prevention. • Spirochaetes - Treponema pallidum - detailed account of Oral Lesions of syphilis, Borrelia vincentii. • Actinomycetes. 	
<p>4 VIROLOGY</p> <ul style="list-style-type: none"> • Introduction • General properties, cultivation, host - virus interaction with special reference to Interferon. • Brief account of Laboratory diagnosis, Chemotherapy and immuno prophylaxis in general. • A few viruses of relevance to dentistry. <ul style="list-style-type: none"> - Herpes Virus - Hepatitis B Virus - brief about other types - Human Immunodeficiency Virus (HIV) - Mumps Virus - Polio virus - Rabies virus - Brief - Measles and Rubella Virus • Bacteriophage - structure and Significance 	12 Hrs.
<p>5 MYCOLOGY</p> <ul style="list-style-type: none"> • Brief Introduction • Candidiasis • Mycetoma • Zygomycosis 	4 Hrs.
<p>6 PARASITOLOGY</p> <ul style="list-style-type: none"> • Brief introduction - protozoans and helminths • Brief knowledge about the mode of transmission and prevention of Malaria, Amoebiasis, Giardiasis, Round worm infection, Hookworm infection, Pin worm infection, Filariasis. 	4 Hrs.

II. Practicals: 30 Hours

PRACTICAL DEMONSTRATIONS

1. Sterilisation and disinfection in detail
2. Culture media
3. Cultural methods and Anaerobic methods
4. Identification of bacteria & demonstration
5. Microscopy

PRACTICALS

6. Simple stain and hanging drop
(Not for exams)
7. Gram's stain
8. ZiehlNeilsen's stain

Sterilization – definition, classification, methods, physical, filtration, radiation, chemicals – used in dental practice, hospital practice.

Culture media – Classification, uses.

Culture methods – Inoculation methods, antibiotic sensitivity, Anaerobic culture techniques.

Microscopy – maintenance, uses, different parts, different types.

LIST OF PRACTICAL MATERIALS

SLIDES FOR DEMONSTRATION:

1. Staphylococcus
2. Streptococcus
3. Gonococcus
4. Pneumococcus
5. M. tuberculosis
6. M .leprae
7. Anthrax
8. Cl. tetani
9. Spirochaetes
10. Gram Negative Bacilli
11. Candida
12. Actinomyces

SLIDES FOR PRACTICAL EXERCISES:

- Grams stain - Gram positive cocci
- Gram negative bacilli
- Gram positive cocci & Gram negative bacilli

Ziehl-Neilsen's stain – Sputum positive for AFB

MEDIA FOR DEMONSTRATION:

UNINOCULATED MEDIA:

1. Nutrient agar plate
2. Blood agar plate
3. Chocolate agar plate
4. Mac Conkey agar plate
5. Glucose citrate broth (Blood culture bottle)
6. Lowenstein Johnson's Media slope
7. Loefflers serum slope
8. Sabourauds slope
9. Milk agar plate
10. Robert cooked meat broth

INOCULATED MEDIA:

1. Nutrient agar with staphylococci
2. Blood agar with Alpha Haemolytic Streptococci
3. Blood Agar with Beta Haemolytic Streptococci
4. Potassium Tealurite with growth of *C.diphtheriae*
5. Milk agar with staphylococci
6. Antibiotics sensitivity plate

INSTRUMENTS

1. VDRL slide
2. Tuberculin syringe
3. Sterile swab
4. Seitz filter
5. Macintosh filds jar

6. Widal rack with tubes
7. Microtitre plate
8. Disposable syringe
9. Surgical gloves

D) SCHEME OF EXAMINATION

1. Internal Assessment : i) Theory : 05 Marks

ii) Practical : 05 Marks

2. Theory : 35 Marks

Distribution of Topics and Type of Questions

Contents	Type of Questions and Marks	Marks
All Topics	MCQ's 5 x 1 mark	05
One Long Essay question from Systematic Bacteriology	Long Essay 1 x 10 marks	10
Questions from General microbiology Immunology Mycology Parasitology / Oral Microbiology Systematic Bacteriology	Short Essays 2 x 5 marks	10
One question from General bacteriology One question from Immunology One question from Systematic Bacteriology Two questions from Virology	Short Answers 5 x 2 marks	10
	Total	35

3. Viva Voce : 10 Marks

4. Practicals : 45 Marks

1. Spotters

5 Slides – 10 Marks

Media – 03 Marks

Instrument – 02 Marks

15 Marks:

2. Gram's Stain 15 Marks
3. Ziehl – Neelsen' 15 Marks

E) RECOMMENDED BOOKS

1. R.Ananthanarayan&C.K.JayaramPaniker, Text book of Microbiology – 7th edition
2. David Greenwood etal., Medical Microbiology –17th edition

REFERENCE BOOKS

3. Prescott, etal. - Microbiology – 7th edition
4. Bernard D. Davis ,etal. – Microbiology – 4th edition
5. Barbara J Howard, etal. - Clinical & Pathogenic Microbiology – 2nd edition
6. MoselioSchaechter, etal. - Mechanisms of Microbial diseases – 4th edition
7. Tizard - Immunology an Introduction – 8th edition
8. Evan Roitt, etal – Immunology – 10th edition

GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICS

A) AIM

The broad goal of teaching undergraduate students in pharmacology is to inculcate rational and scientific basis of therapeutics keeping in view of the dental curriculum and profession.

B) OBJECTIVES

a) KNOWLEDGE & UNDERSTANDING

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

Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs in general and in dentistry in particular.

1. List the indications, contraindications; interactions, and adverse reactions of commonly used drugs with reason.
2. Tailor the use of appropriate drugs in disease with consideration to its cost efficacy safety for individual and mass therapy needs.
3. Indicate special care in prescribing common and essential drugs in special medical situations such as pregnancy, lactation, old age, renal, hepatic damage and immune compromised patients.
4. Integrate the rational drug therapy in clinical pharmacology.
5. Indicate the principles underlying the concepts of "Essential drugs"

b) SKILLS

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

1. Prescribe drugs for common dental and medical ailments
2. 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.

c) INTEGRATION

Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical departments.

C) COURSE CONTENT IN DETAIL – II BDS**I. Theory : Minimum Teaching Hours: 70 Hours****A. 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.	10 Hrs.
2	CNS drugs; General anaesthetics, hypnotics, analgesics psychotropic drugs, anti — epileptics, muscle relaxants, local anaesthetics, Implications of these drugs in clinical dentistry.	12 Hrs.
3	Autonomic drugs; sympathomimetics, antiadrenergic drugs parasympathomimetics and parasympatholytics, Implications of Autonomic drugs in clinical dentistry	11 Hrs.
4	Cardiovascular drugs: Cardiac stimulants ,antihypertensive drugs vasopressor agents, treatment of shock, Antianginal agents and diuretics, Implications of these drugs in clinical dentistry	5 Hrs.
5	Autocoids: Histamine, antihistamines, prostaglandins, leukotrienes and bronchodilators, Implications of Autocoids in clinical dentistry.	3 Hrs.
6	Drugs acting on blood : coagulants and anticoagulants, hematinics, Implications of these drugs in clinical dentistry.	5 Hrs.
7	G I T Drugs: Purgatives anti diarrhoeal antacids anti emetics Implications of these drugs in clinical dentistry.	3 Hrs.
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.	5 Hrs.
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 Chemotherapy in clinical dentistry.	14 Hrs.

10	Vitamins : Water soluble vitamins, Vit. D, Vit.K. and Vit. E. Implications of Vitamins in clinical dentistry.	1 Hr
11	Pharmacotherapy of emergencies in dental office and emergency drugs tray Implications of Pharmacotherapy in clinical dentistry.	1 Hr
12	Chealating agents — BAL, EDTA and desferrioxamine.	1 Hr

B. Dental Pharmacology

1	Antiseptic & astringents, obtundents, mummifying agents, bleaching agents, styptics, disclosing agents, dentifrices, mouth washes, caries and fluorides.	4 Hrs
2	Pharmacotherapy of common oral conditions in dentistry. practical and Demonstrations: To familiarise the student with the methodology: prescription writing and dispensing. Rationale of drug combinations of marketed drugs.	

II. Practicals : 20 Hrs.

1. Introduction – equipments used in dispensing pharmacy, prescription – parts and model prescription.
2. Demonstration of common dosage forms used in clinical practice.
3. Mixtures – one example (Expectorant/Salicylate) of simple and diffusible (Bismuth Kaolin/chalk) mixtures.
4. Emulsion – Types and example (Liniment turpentine/Shark liver oil) of emulsion.
5. Powders – tooth powder
6. Mandl's paint/Gum paint percentage dilution – concept and calculations with suitable examples.
7. Mouth washes – Alkaline, antiseptic, astringent
8. Tooth pastes
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, pseudomembranous colitis, diabetes mellitus, diabetic coma

osteoarthritis, anaphylaxis, status asthmaticus, Status epilepticus, iron deficiency & pernicious anemia.

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 tooth ache, post operative pain, post extraction pain with swelling, oral candidiasis, scurvy etc.

D) SCHEME OF EXAMINATION

1. Internal Assessment : i) Theory : 10 Marks
ii) Practical : 10 Marks

2. Theory : 70 Marks

Distribution of Topics and Type of Questions:

Contents	Type of Questions and Marks	Marks
Pharmacology for dental students All topics	MCQ's 10x1 mark	10
One long essay from dental pharmacology One long essay from: Pharmacokinetics Pharmacodynamics Antibiotics NSAIDS Local anesthetics Anti coagulants Beta blockers Glucocorticoids Calcium channel blockers ACE Inhibitors Opioid analgesics Sympathomimetics Anti-Cholinergics Cardiac Glycosides	Long Essays 2 x 10 marks	20
To classify the drug and write its mechanism of action or adverse effect or clinical use or specific antidote indicated in its poisoning, if any	Short Essays 4 x 5 marks	20
To classify the drug and write its mechanism of action or adverse effect or clinical use or specific antidote indicated in its poisoning, if any	Short Answers 10 x 2 marks	20
	Total	70

3. Viva Voce : 20 Marks

4. Practicals : 90 Marks

1. Pharmacy Preparations
(one medical plus one dental preparation) = 20marks

2. Prescription writing
(one medical plus one dental prescription) 2 Nos. (10+10 marks) = 20 Marks

3. Spotters 10 Nos. x 2 Marks = 20 Marks

4. Dosage formulation: =10 marks

5. Fixed Dose Combination(FDCs) =10 marks

6. Drug stations: =10 marks

Total:90 marks

E) RECOMMENDED BOOKS

1. Satoskar R.S. & Bhandarkar S.D., Pharmacology and Pharmacotherapeutics part 1 & part 2 – 20th edition
2. Bertram G Katzung, Basic and Clinical Pharmacology – 10th edition
3. Lauerence DR. Clinical Pharmacology - 7th edition
4. Tripathi K.D, Essentials of Medical Pharmacology - 6th edition
5. Bertram .G.Katzung ,Basic and clinical Pharmacology 11th edition McGraw Hill
6. Tripathi Essentials of Pharmacology for Dentistry, 2nd edition Jaypee brothers
7. Rang and Dale's Pharmacology 6th edition
8. Padmaja Udaykumar , Pharmacology for dental and allied health sciences, 3rd edition ,Jaypee brothers.

DENTAL MATERIALS

A) GOAL:

Aim of the course is to present basic chemical, physical and biological properties of Dental materials as they are related to its manipulation to give a sound educational background so that the practice of 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.

B) OBJECTIVES:

a. KNOWLEDGE AND UNDERSTANDING:

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

1. To explain purpose of course in dental materials to personnel concerned with the profession of 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-coordinating factors into the desired earnest. Laying down standards or specifications of various materials to guide to manufacturers as well as to help professionals.
2. Search for newer and better materials which may answer our requirements with greater satisfaction. To understand and evaluate the claims made by manufacturers of dental materials.

b. NEED 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 possess 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 acceptable.

c. SCOPE

The dental materials are employed in mechanical procedures including restorative dentistry such as Prosthodontics, Endodontics, Periodontics, Orthodontics and Restorative materials & implant dentistry. 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 and alkalinity of fluids show pH varies from 4 to 8.5. The load on 1sq. 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.

C) COURSE CONTENT IN DETAIL

I. Theory : Total 90 hrs.

I BDS : 30 hrs.

II BDS : 60 hrs.

<p>1. STRUCTURE OF MATTER AND PRINCIPLES OF ADHESION</p> <ul style="list-style-type: none"> • 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 	<p>03 Hrs.</p>
<p>2. IMPORTANT PHYSICAL PROPERTIES APPLICABLE TO DENTAL MATERIALS</p> <ul style="list-style-type: none"> • 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 • Colour, three dimensional colour - hue, values, chroma, Munsell system, metamerism, fluorescence, physical properties of tooth, stress during mastication • Thermal conductivity & coefficient of thermal expansion are physical properties based on laws of thermodynamics. Stress, strain, proportional limit, elastic limit 	<p>06 Hrs.</p>

<ul style="list-style-type: none"> • 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 	
<p>3. BIOLOGICAL CONSIDERATIONS IN USE OF DENTAL MATERIALS</p> <ul style="list-style-type: none"> • 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. Example: contact with soft tissues, affecting vitality of pulp, used for root canal fillings, affecting hard tissues of teeth, laboratory materials that could accidentally be inhaled or ingested during handling • Hazards associated with materials: pH affecting pulp, polymers causing chemical irritation, mercury toxicity, etc. Micro leakage, Thermal changes, Galvanism, toxic effect of materials. Biological evaluation for systemic toxicity, skin irritation, mutagenicity and carcinogenicity • Disinfection of dental materials for infection control 	04 Hrs.
<p>4. GYPSUM & GYPSUM PRODUCTS</p> <ul style="list-style-type: none"> • Gypsum - its origin, chemical formula, Products manufactured from gypsum. Dental plaster, Dental stone, Die stone, high strength, high expansion stone • ADA classification of gypsum products 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, 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 	06 Hrs.

<p>5. IMPRESSION MATERIALS USED IN DENTISTRY</p> <ul style="list-style-type: none"> • Purpose of making Impression, Ideal properties required and application of material, Classification as per ADA specification, general & individual Impression material, 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 silicone, Addition silicone, polyether, Visible light cure polyurethane 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 	05 Hrs.
<p>6. SYNTHETIC RESINS USED IN DENTISTRY.</p> <ul style="list-style-type: none"> • Classification of resins, Historical background and development of material 	01 Hrs.
<p>7. ACRYLIC RESINS</p> <ul style="list-style-type: none"> • Mode of polymerisation: Heat activated, Chemically activated, Light activated, Mode of supply, application, composition, polymerisation reaction of each • Denture base materials and their classification and requirement • Dental resins - requirements of dental resins, applications, polymerisation, polymerisation mechanism stages in addition polymerisation Technical considerations: Methods of manipulation for each type of resin. Physical properties of denture base resin • Inhibition of polymerisation, co-polymerisation, molecular weight, crosslinking, plasticisers, Physical properties of polymers, polymer structures types of resins, Flasking techniques • Miscellaneous resins & techniques: Repair resins, Relining and rebasing. Short term and long-term soft-liners, temporary crown and bridge resins, Resin impression trays, 	05 Hrs.

Tray materials, Resin teeth, materials in maxillofacial prosthesis, Denture cleansers, Infection control in detail, Biological properties and allergic reactions	
<p>8 RESTORATIVE RESINS</p> <ul style="list-style-type: none"> • Historical background. Classification of Composites: Composition, properties of Unfilled & filled. • Polymerisation mechanisms: Polymerisation shrinkage, Chemical, Light, Dual cure: conversion • Bonding: Need for bonding, Mode of bonding, Bond strength, Acid -etch technique, Enamel & Dentin bonding • Manipulation: Chemical, light, dual cure ;Direct bonding, Sandwich technique indications & procedure • Finishing and polishing of composite restorations, Repair of composites • Resins for restoring eroded teeth, Pit and fissure sealing, Resin inlay system - Indirect & direct, Core build up, Orthodontic applications 	06 Hrs.
<p>9 DENTAL CEMENTS</p> <ul style="list-style-type: none"> • Definitions & Ideal requirements and classification of cements • Silicate and zinc poly-carboxylate cement* • Glass ionomer cement* • GIC Modifications and recent advances* • GIC- Properties, manipulation and protection of cement* • Zinc oxide eugenol, modified zinc oxide eugenol cement* • Zinc phosphate, zinc silico-phosphate* • Calcium hydroxide and Guttapercha* • Cavity liners, varnishes and cement bases * <p>*Application, 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.</p>	10 Hrs.
<p>10 DENTAL AMALGAM</p> <ul style="list-style-type: none"> • History: Definition of dental amalgam, composition, manufacturing, classification, application • Amalgamation: setting reaction & resulting structure, properties, Microleakage, dimensional stability, strength, creep, clinical performance • Manipulation: Selection of alloy, mode of supply, proportioning, trituration, condensation, carving & finishing • Dimensional changes, Marginal deterioration., Repair, toxicity, hygiene, recent advances & mercury free amalgam 	05 Hrs
<p>11 DIRECT FILLING GOLD</p> <ul style="list-style-type: none"> • Classification. Manufacture, mode of supply, properties, mode of adhesion. • Manipulation, Removal of surface impurities and condensation of direct filling gold. Finishing procedures 	02 Hrs.

<p>12 DENTAL WAXES</p> <ul style="list-style-type: none"> • Introduction importance. Source & chemical nature. Classification, Properties: melting range, thermal expansion, flow & residual stresses, ductility & residue. • Inlay wax: Mode of supply: Classification & composition, Ideal requirements: Properties: Flow, thermal properties Wax distortion, causes. Manipulation: Instruments & equipment required, • Casting, Base plate, Processing, Boxing, Utility, Sticky, Impression, corrective impressions, Bite registration waxes 	03 Hrs.
<p>13 DIES</p> <ul style="list-style-type: none"> • Ideal requisites, classification Types - Gypsum products, electroforming, epoxy resin, Amalgam. • Die making, Die spacer and die lubricants. • 	02 Hrs.
<p>14 METAL AND ALLOYS</p> <ul style="list-style-type: none"> • Structure & behavior, Solidification, mechanism of crystallization - amorphous & crystalline • Solid solutions, Physical properties, Metallography Solid state reaction, binary systems - Peritectic, eutectic alloys. • Dental casting alloys: Historical background, Classification, High noble, Noble & predominantly base metal. Alloys for crown & bridge and removable partial denture. • Heat treatment: Softening & hardening heat treatment. Recycling of metals. • Cobalt chromium alloys, composition, allocation, properties, uses • Nickel-alloys, inclusive of metal ceramic alloys composition, allocation, properties, uses • Noble casting alloys composition, allocation, properties, uses 	07 Hrs.
<p>15 DENTAL CASTING INVESTMENTS</p> <ul style="list-style-type: none"> • Definition, requirements, classification, Gypsum bonded, Phosphate bonded, Silica bonded. Mode of Supply: Composition, application, setting mechanism, setting time and factors controlling it. • Expansions: Setting, Hygroscopic & thermal expansion: factors affecting. • Casting shrinkage and compensation of casting shrinkage. • Casting procedure - wax pattern, spruing, investing, wax burnout, and heating the invested ring, casting • Casting machines, source of heat for melting the alloy and techniques of casting. Retrieving, finishing and polishing • Defects in casting. Handling hazards & precautions for base metal alloys 	06 Hrs.
<p>16 TARNISH AND CORROSION</p> <ul style="list-style-type: none"> • Definition, types, causes of corrosion, protection against corrosion, corrosion of dental restorations, clinical significance of galvanic current 	01 Hr.

<p>17 SOLDERING, BRAZING AND WELDING</p> <ul style="list-style-type: none"> • Definition, indications, ideal requirements, types of solders, fusion temperature, application. Mode of supply, Composition, selection, properties. Tarnish & corrosion resistance, microstructure of soldered joint. • Fluxes & Anti fluxes: Function, types, commonly used fluxes & their selection. Free hand soldering and investment, steps and procedure • Welding: Definition, application, requirements, procedure, weld decay – causes and how to avoid it. Laser welding 	03 Hrs.
<p>18 WROUGHT BASE METAL ALLOYS</p> <ul style="list-style-type: none"> • Introduction • Stainless steels: Description, type, composition & properties. Sensitization & stabilization, strength, tensile, yield strength, KHN. Braided & twisted wires - their need • Titanium alloys, application, composition, properties, welding, corrosion resistance 	03 Hrs.
<p>19 DENTAL CERAMICS</p> <ul style="list-style-type: none"> • Historical background & general applications • Dental ceramics: Definition, classification, application, mode of supply, manufacturing procedure, strengthening. • Properties of fused ceramic: Strength, factors affecting, modulus of elasticity, surface hardness, wear resistance, thermal properties, specific gravity, chemical stability, esthetic properties, biocompatibility, technical considerations • Metal Ceramic Bond - Nature of bond, electrodeposition, foil copings, bonded platinum foil, swaged gold alloy foil • 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 	06 Hrs.
<p>20 DENTAL IMPLANTS</p> <ul style="list-style-type: none"> • Evolution of dental implants, classification. • Types materials and application 	02 Hrs.
<p>21 ABRASION & POLISHING AGENTS</p> <ul style="list-style-type: none"> • Definition, Need .Diamond, Emery, aluminum oxides, garnet, pumice, Kieselgurh, tripoli, sand, rouge, tin oxide, chalk, chromic oxide, carbides, zirconium silicate, Zinc oxide Finishing, polishing & cleaning. • Abrasive action: characteristics, rate, size, pressure & speed. Grading Binder, Technical consideration, Electrolytic polishing. 	02 Hrs.
<p>22 MECHANICS OF CUTTING</p> <ul style="list-style-type: none"> • Burs and points. 	01 Hr.
<p>23. Disposal of prosthodontics waste, Sterilisation and disinfection protocol</p>	01 Hr

II. Practicals : 240 Hrs. (I BDS- 40 Hrs. II BDS – 200 Hrs.)

Manipulation of relevant Dental Materials.

D) SCHEME OF EXAMINATION

1. Internal Assessment : i) Theory : 10 Marks

ii) Practical : 10 Marks

2. Theory : 70 Marks

Distribution of Topics and Type of Questions

Contents	Type of Questions and Marks	Marks
Materials used in Conservative Dentistry Materials used in Prosthodontics	MCQ's 5X1 mark 5X1 mark	10
Conservative Dentistry Prosthodontics	Long Essays 1 X 10 marks 1 X 10 marks	20
Conservative Dentistry, Prosthodontics and Orthodontia	Short Essays 4 X 5 marks	20
Conservative Dentistry and Prosthodontics	Short Answers 10 X 2 marks	20
	Total	70

3. Viva Voce : 20 Marks

4. Practicals : 90 Marks

1. Spotters - 30 Nos. x 1 mark = 30 marks

2. Exercise 1 - = 35 marks

Any one exercise of the following:

- Manipulation of impression compound
- Manipulation of alginate impression material
- Manipulation of Zinc Oxide Eugenol impression paste
- Manipulation of Rubber Base impression material and preparation of Stone cast.
- Mixing of heat cure acrylic resin and recording of time taken for all stages.

3. Exercise No.2 = 25 marks

Manipulation of any one of the following Dental Cements.

- a. ZOE (Luting and filling consistency)
- b. Zinc Phosphate cement (Luting and Base consistency)
- c. Silicate cement (filling consistency)
- d. Glasslonomer cement type I/II (Luting/filling consistency)
- e. Polycarboxylatecement (Luting consistency).

(Cements which are mixed for filling consistency should be filled in the cavity prepared in the extracted natural tooth / typhodont.)

- f. Trituration of silver amalgam and condensation into the cavity prepared in extracted natural tooth/typhodont.

E) RECOMMENDED BOOKS:

1. Kenneth J. Anusavice .Phillips Science of Dental Materials , 12th edition
2. Robert G.Craig - Restorative Dental Material, 11th Edition
3. V.ShamaBhat& B.T. Nandeesh - Science of Dental materials clinical applications, 1st edition
4. Criag,Powers, Wataha - Dental Materials-Properties and Manipulation, 10th edition

REFERENCE BOOKS:

5. E.C. Combe. Notes on Dental Materials, 6th edition
6. O' Brien, W.J. Dental materials – Properties and their selection, 3rd edition
7. McCabe. Applied dental materials — 9th edition

PRECLINICAL CONSERVATIVE DENTISTRY

A) AIMS

Pre-clinical exposure is aimed to provide training to develop skills in the treatment procedures to be adopted in a clinical situation. The skill development is practiced on simulator conditions using Phantom Head Jaws and Typhodont teeth. Cavity preparation, cuspal restoration, root canal procedure, restorations of various types are mastered for application in the clinical practice.

B) OBJECTIVES

a) KNOWLEDGE & UNDERSTANDING

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 materials 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.

b) SKILLS : Psychomotor

1. To use medium and high speed hand pieces to carry out restorative work.
2. Possess the skills to use and familiarise endodontic instruments and materials needed for carrying out simple endodontic treatment.
3. To achieve the skills to translate patients esthetic needs along with function.

C) COURSE CONTENT IN DETAIL – II BDS

I. Theory: Minimum Teaching Hours: 25 hours

1	<ul style="list-style-type: none"> • Introduction • Nomenclature • Hand cutting instruments • Rotary cutting instruments • Principles of cavity preparation • Class I cavity preparation – for silver amalgam • Class II cavity preparation- for silver amalgam • Silver amalgam-Technical considerations • Matrices, wedges, and separators • Liners, intermediary bases and bases 	13 Hrs.
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2	<p>TOOTH COLOURED RESTORATIONS</p> <ul style="list-style-type: none"> • Silicates • Unfilled resins • Composite resin – Cavity preparation III, IV, V • Glass Ionomers • Porcelain 	5 Hrs.
3	<ul style="list-style-type: none"> • Temporary restorations • Features of a Gold inlay cavity • Steps in fabricating a gold inlay 	4 Hrs.
4	<ul style="list-style-type: none"> • Anatomy of pulp cavity • Vital pulp therapy • Introduction to root canal treatment 	3 Hrs.

II. Practicals: 200 Hours

1. Identification and study of handcutting instruments, chisel, gingival margin trimmers, excavators and hatchet.
2. Identification and use of rotary cutting instruments in contra angle hand pieces [MICROMOTOR], burs and Abrasive points.
3. Preparation of class-I and extended class-I; Class-II MO/DO and MOD's; Class-III and Class-V amounting to 10 exercises in plaster models.
4. Management of deep carious lesions – Caries excavation, Pulp capping and Temporary restoration. Ten exercises on mounted extracted teeth.
5. Exercises on Typhodont teeth in phantom head which includes cavity preparation, pulp protection, Matrix application and wedge placement followed by amalgam restoration.

Class I	5
Class I with extension	2
Class II	10
Class II MOD	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 and composite resin restoration on extracted tooth.
8. Finishing and polishing of composite restorations.
9. Identification and manipulation of cavity varnish, bases like Zinc Phosphate, Poly carboxylate, Glass-Ionomer and Zinc Oxide - Eugenol cements.
10. Identification and manipulation of various matrices, tooth separators and restorative materials like composites and modified glass Ionomer cements.

11. Cast Restoration

1. Preparation of Class-II inlay cavity

2. Fabrication of wax pattern
3. Spruing and investment of wax pattern
4. Heat treatment and casting
5. Finishing and cementing of class-II inlay on extracted tooth.

12. Endodontics

1. Identification of basic endodontic instruments
2. Coronal access cavity preparation on extracted. maxillary central incisors
3. Determination of working length.
4. Biomechanical preparation of root canal space of central incisor
5. Obturation of root canal spaces. Absence of coronal access cavity.
6. Closure of access cavity

D) SCHEME OF EXAMINATION

1. **Internal Assessment :** **20 Marks**
2. **University Examination: Practical :** **60 Marks**

Exercise No.1: 10 marks

Spotters: 2 minutes each: 10 Nos x 1 mark

Spotters

- a. Hand Instruments used to prepare cavity and restoration
- b. Identification of Rotary Cutting Instruments, Matrices, Separators, Pulp Protecting Agents, Restorative Materials.

Practical Exercise No.2 : 50 marks

Preparation of class II Conventional cavity for silver amalgam in Maxillary or Mandibular 1st or 2nd Molar tooth (Typhodont/ Natural Tooth)

Cavity preparation	45 minutes	: 25 marks
Lining and matrix	15 minutes	; 10 marks
Filling and carving	30 minutes	: 15 marks

3. **Viva Voce :** **20 Marks**

E) RECOMMENDED BOOKS

1. Sturdevant – The art and Science of Operative Dentistry – 5th edition
2. Charbeneau – Principles & Practice of Operative Dentistry – 3rd edition
3. Grossman - Endodontic Practice – 11th edition

PRE-CLINICAL PROSTHODONTICS

A) AIMS

1. The goal of pre-clinical Prosthodontics program is to provide basic and advanced education for an improved understanding of prosthetic rehabilitation and restoration of tooth structures.
2. To increase cognitive skills in management of geriatric and general patients.
3. To transform the nature of dental education in ways that will dramatically improve the way we serve our students, our patient and the surrounding community.

Students will be familiarized with the scientific background for Prosthodontics, including contributions from the published prosthodontic literature.

B) OBJECTIVES

a) KNOWLEDGE & UNDERSTANDING

The student should have a deep knowledge and understanding of the normal functioning of the masticatory system and the dental occlusion, and of dysfunctions of the system relevant to adult restorative dentistry in general and Prosthodontics in particular.

Students will be trained, guided and supervised to perform the design to the highest level of competency, the full range of laboratory and part of clinical procedures, which are considered essential to establish a practice in Prosthodontics.

The program devotes a considerable portion of time to advanced basic science courses specially organized to serve as a prerequisite to the thorough understanding of the clinical problem in prosthetic rehabilitation in the clinical area.

b) SKILLS

1. The curriculum has been designed to enable the student to attain skills representative of a clinician proficient in the theoretical and practical aspects of the clinical Prosthodontics. The current program is designed to provide knowledge and skills, pertaining to the restoration and maintenance of oral function, comfort, appearance and health of the patient by the restoration of natural teeth and or replacement of missing teeth and craniofacial tissue with artificial substitutes to a standard of performance established for the practice of Prosthodontics.

C) CONTENT OF THE COURSE – I & II BDS**I. Theory: Minimum Teaching Hours: 25 Hours****A. Complete Dentures**

1	APPLIED ANATOMY AND PHYSIOLOGY	02 Hrs
	<ul style="list-style-type: none"> • Introduction • Biomechanics of the edentulous state. • Residual ridge resorption. 	
2	COMMUNICATING WITH THE PATIENT	01 Hr
	<ul style="list-style-type: none"> • Understanding the patients. Mental attitude. • Instructing the patient. 	
3	DIAGNOSIS AND TREATMENT PLANNING FOR PATIENTS	02Hr
	<ul style="list-style-type: none"> • With some teeth remaining. • With no teeth remaining. <ul style="list-style-type: none"> a) Systemic status. b) Local factor. c) The geriatric patient. d) Diagnostic procedures. 	
4	ARTICULATORS – DISCUSSION	03 Hr
5	IMPROVING THE PATIENT'S DENTURE FOUNDATION AND RIDGE RELATION - AN OVERVIEW	
	<ul style="list-style-type: none"> • Pre-operative examination. • Initial hard tissue & soft tissue procedure. • Secondary hard & soft tissue procedure. • Implant procedure. • Congenital deformities. • Postoperative procedure. 	03 Hr
6	PRINCIPLES OF RETENTION, SUPPORT AND STABILITY	02 Hr
7	IMPRESSIONS – DETAIL	03 Hr
	<ul style="list-style-type: none"> • Muscles of facial expression. 	

	<ul style="list-style-type: none"> • Biologic considerations for maxillary and mandibular impression including anatomical landmarks and their interpretation. • Impression objectives. • Impression materials. • Impression techniques. • Maxillary and mandibular impression procedures. <ul style="list-style-type: none"> ○ Preliminary impressions. ○ Final impressions. • Laboratory procedures involved with impression making (Beading & Boxing, and cast preparation). 	
8	RECORD BASES AND OCCLUSION RIMS- IN DETAIL	02 Hrs
	<ul style="list-style-type: none"> • Materials & techniques. • Useful guidelines and ideal parameters. • Recording and transferring bases and occlusal rims. 	
9	BIOLOGICAL CONSIDERATION IN JAW RELATION & JAW MOVEMENTS CRANIOMANDIBULAR RELATIONS	
	<ul style="list-style-type: none"> • Mandibular movements. • Maxillo -mandibular relation including vertical and horizontal jaw relations. • Concept of occlusion- discuss in brief. 	02 Hrs
10	RELATING THE PATIENT TO THE ARTICULATOR	01 Hr
	<ul style="list-style-type: none"> • Face bow types & uses– discuss in brief. • Face bow transfer procedure - discuss in brief. 	
11	RECORDING MAXILLO MANDIBULAR RELATION	03 Hr
	<ul style="list-style-type: none"> • Vertical relations. • Centric relation records. • Eccentric relation records. • Lateral relation records. 	
12	TOOTH SELECTION AND ARRANGEMENT	02 Hr
	<ul style="list-style-type: none"> • Anterior teeth. • Posterior teeth. • Esthetic and functional harmony. 	

13	RELATING INCLINATION OF TEETH TO CONCEPT OF OCCLUSION- IN BRIEF
	<ul style="list-style-type: none"> • Neurocentric concept. • Balanced occlusion concept : 01 Hr
14	TRIAL DENTURES01 Hr
15	LABORATORY PROCEDURES 02 Hrs
	<ul style="list-style-type: none"> • 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.
16	DENTURE INSERTION 01 Hr
	<ul style="list-style-type: none"> • Insertion procedures. • Clinical errors. • Correcting occlusal disharmony. • Selective grinding procedures.
17	TREATING PROBLEMS WITH ASSOCIATED DENTURE USE – DISCUSS IN BRIEF (TABULATION/FLOWCHART FORM) 01 Hr
18	TREATING ABUSED TISSUES - DISCUSS IN BRIEF 01Hr
19	RELINING AND REBASING OF DENTURES- DISCUSS IN BRIEF01 Hr
20	IMMEDIATE COMPLETE DENTURES CONSTRUCTION PROCEDURE- DISCUSS IN BRIEF 01 Hr
21	THE SINGLE COMPLETE DENTURE- DISCUSS IN BRIEF01Hr

22	OVERDENTURES DENTURE- DISCUSS IN BRIEF01 Hr
23	DENTAL IMPLANTS IN COMPLETE DENTURE - DISCUSS IN BRIEF01 Hr

- N O T E

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

B. Removable Partial Dentures

1	Introduction01 Hr	
	<ul style="list-style-type: none"> • Terminologies and scope 	
2	Transitional acrylic removable dentures	01 Hr
3	Mouth preparation	01 Hr
4	Clasps	02 Hr

II. Practical: 300 Hours (I BDS -100 Hrs. II BDS- 200 Hrs)

1. Marking of anatomical land marks on a primary cast
2. Making of edentulous impressions using impression compound on a model
3. Making of primary casts
4. Beading and Boxing
5. Preparation of special trays
6. Preparation of temporary and permanent denture bases
7. Preparation of occlusion rims
8. Orientation of occlusion rims on articulator
9. Arrangement of teeth

10. Processing of complete dentures
11. Repair of fractured denture
12. Remount of processed denture for occlusal correction
13. RPD – Classification and designing

D) SCHEME OF EXAMINATION

- 1. Internal Assessment: 20 marks**
- 2. University Examination: 60 marks**

Arrangement of teeth in class I relation, waxing, carving, polishing

- 3. Viva Voce: 20 marks**

E) RECOMMENDED BOOKS

1. Sheldon Winkler - Essentials of complete denture prosthodontics – 3rd edition
2. Hickey J.C., Zarb G.A., Bolender C.L. - Boucher's "Prosthodontic treatment for edentulous patients" – 13th edition

REFERENCE BOOKS

3. Charles M. Heartwell Jr. and Arthur O. Rahn. - Syllabus of Complete denture - 5th edition
4. Alan B Carr, GlenPMcGivney, DavidTBrown. McCracken's Removable partial prosthodontics - 13th edition
5. Mc. Gregor, Fenn, HR.B, Liddelw, K.P., Clinical dental prosthetics - 3rd edition
6. Ernest L. Miller and Joseph E. Grasso. - Removable partial prosthodontics – 2nd edition

GENERAL MEDICINE

A) GOAL

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

1. Special precautions/ contraindication of anesthesia 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.

B) OBJECTIVES

a) KNOWLEDGE & UNDERSTANDING

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 should be able to evaluate and analyse scientifically various established facts and data.
2. 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.

b) SKILLS

1. Able to diagnose and manage various common medical 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 skill to prevent and manage complications if encountered while carrying out various dental surgical and other procedures.

C) COURSE CONTENT IN DETAIL**I. Theory : Minimum Teaching Hours: 60 Hrs.**

1. Aims of medicine <ul style="list-style-type: none"> • Definitions of signs, symptoms, diagnosis, differential diagnosis, treatment & prognosis. 	02 Hrs.
2. Infections <ul style="list-style-type: none"> • Enteric Fever • AIDS • Herpes simplex • herpes zoster • Syphilis • Diphtheria • Infectious mononucleosis • Mumps, measles, rubella • Malaria • Tetanus 	06 Hrs.
3. Gastro Intestinal Tract <ul style="list-style-type: none"> • Stomatitis • Gingival hyperplasia • Dysphagia • Acidity, peptic ulcer • Jaundice • Acute and chronic hepatitis • Cirrhosis of liver • Ascitis • Diarrohea • Dysentery • Amoebiasis • Malabsorption • Oral manifestations of systemic diseases 	07 Hrs.
4. Cardio Vascular System <ul style="list-style-type: none"> • Acute rheumatic fever • Rheumatic valvular heart disease • Hypertension • Ischemic heart disease • Infective endocarditis • Common arrhythmias 	08 Hrs.

<ul style="list-style-type: none"> • Congenital heart disease • Congestive cardiac failure 	
5. Respiratory System <ul style="list-style-type: none"> • Pneumonia • COPD • Pulmonary TB • Bronchial asthma • Lung Abscess • Pleural effusion • Pneumothorax • Bronchiectasis • Lung cancers 	07 Hrs.
6. Hematology <ul style="list-style-type: none"> • Anemias • Bleeding & clotting disorders • Leukemias • Lymphomas • Agranulocytosis • Splenomegaly • Oral manifestations of hematologic disorders • Generalized Lymphadenopathy 	08 Hrs.
7. Renal System <ul style="list-style-type: none"> • Acute nephritis • Nephrotic syndrome • Renal failure 	03 Hrs.
8. Nutrition <ul style="list-style-type: none"> • Avitaminosis • Balanced diet • PEM • Obesity 	04 Hrs.
9. Central Nervous System <ul style="list-style-type: none"> • Facial palsy • Facial pain including trigeminal neuralgia • Epilepsy 	03 Hrs.

<ul style="list-style-type: none"> • Headache including migraine <ul style="list-style-type: none"> ○ Meningitis ○ Examination of comatose patient ○ Examination of cranial nerves. 	
<p>10. Endocrines</p> <ul style="list-style-type: none"> • Diabetes Mellitus • Acromegaly • Hypothyroidism • Thyrotoxicosis • Calcium metabolism and parathyroids. • Addison’s disease • Cushing’s syndrome 	07 Hrs.
<p>11. Critical care</p> <ul style="list-style-type: none"> • Syncope • Cardiac arrest • CPR • Shock • Ac LVF • ARDS • Anaphylactic shock 	05 Hrs.

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.

D) SCHEME OF EXAMINATION

1. Internal Assessment - i) Theory : 10 marks
 ii) Practical : 10 marks

2. Theory : 70 Marks

Distribution of Topics and Type of Questions:

Contents	Type of Questions And Marks	Marks
All the topics	MCQ’s 10 x 1 mark	10

Infections Gastro Intestinal Tract Cardio Vascular System Respiratory System Hematology Renal System Nutrition Central Nervous System Endocrines	Long Essays 2 x 10 marks	20
Aims of medicine Infections Gastro Intestinal Tract Cardio Vascular System Respiratory System Hematology Renal System Nutrition Central Nervous System Endocrines Critical care	Short Essays 4 x 5 marks	20
Aims of medicine Infections Gastro Intestinal Tract Cardio Vascular System Respiratory System Hematology Renal System Nutrition Central Nervous System Endocrines Critical care	Short Answers 10 x 2 marks	20
Total		70

3. Viva Voce : 20 Marks

4. Clinicals : 90 Marks

- i. Case History : 20 marks
- ii. Clinical Examination: 40 marks
- iii. Investigation : 10 marks
- iv. Diagnosis & D.D. : 10 marks
- v. Management : 10 marks

E) RECOMMENDED BOOKS

1. Davidson Text book of Medicine-19th edition
2. Hutchinson clinical methods-21st edition
3. API Text book of Medicine-7th edition
4. Medicine for dental students-Alagappan

GENERAL SURGERY

A) GOAL

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.

B) OBJECTIVES

a) KNOWLEDGE & UNDERSTANDING

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 should be able to evaluate and analyse scientifically various established facts and data.
2. 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 General Surgery.

b) SKILLS

1. Able to diagnose and manage various common surgical 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 skill to prevent and manage complications if encountered while carrying out various dental surgical and other procedures.

C) COURSE CONTENT IN DETAIL

I. Theory : **Minimum Teaching Hours:** 60 Hrs.

<p>1. HISTORY OF SURGERY:</p> <p>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</p>	<p>02 Hrs</p>
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specialties in the practice of modern surgery.	
<p>2. GENERAL PRINCIPLES OF SURGERY:</p> <p>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.</p>	03 Hrs.
<p>3. WOUNDS:</p> <p>Their classification, wound healing, repair, treatment of wounds, medicolegal aspects of accidental wounds and complications of wounds.</p>	03 Hrs.
<p>4. INFLAMMATION:</p> <ul style="list-style-type: none"> • soft and hard tissue inflammation • Causes of inflammation • varieties • treatment and • sequelae. 	02 Hrs.
<p>5. INFECTIONS:</p> <ul style="list-style-type: none"> • Acute and chronic abscess skin infections, • cellulitis, carbuncle, and erysepelas. • Specific infections such as <ul style="list-style-type: none"> • tetanus • Gangrene • syphilis • gonorrhoea • tuberculosis • Actinomycosis • Vincent's angina • cancrum oris • Pyaemia • toxaemia and • septicaemia 	06 Hrs.
<p>6. TRANSMISSABLE VIRAL INFECTIONS:</p> <ul style="list-style-type: none"> • HIV and Hepatitis B with special reference to their prevention and precautions to be taken in treating patients in a carrier state. 	02 Hrs.

<p>7. SHOCK AND HAEMORRHAGE:</p> <ul style="list-style-type: none"> • 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. 	04 Hrs.
<p>8. TUMOURS, ULCERS, CYSTS, SINUS AND FISTULAE:</p> <ul style="list-style-type: none"> • Classification, clinical examination and treatment principles in various types of benign and malignant tumours, ulcers, cysts, sinus and fistulae. 	07 Hrs.
<p>9. DISEASES OF LYMPHATIC SYSTEM:</p> <ul style="list-style-type: none"> • Especially those occurring in head and neck region. • Special emphasis on identifying diseases such as <ul style="list-style-type: none"> • tubercular infection, • lymphomas, • leukaemias, • metastatic lymph node diseases. • Infective and malignant diseases of the oral cavity 	04 Hrs.
<p>10. DISEASES OF THE ORAL CAVITY</p> <ul style="list-style-type: none"> • Oropharynx including salivary glands with special emphasis on preventive aspects of premalignant and malignant diseases of the oral cavity. 	05 Hrs.
<p>11. DISEASES OF LARYNX, NASOPHARYNX:</p> <ul style="list-style-type: none"> • Infections and tumours affecting these sites. • Indications, procedure and complications of tracheostomy. 	02 Hrs.
<p>12. NERVOUS SYSTEM:</p> <ul style="list-style-type: none"> • 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 presentation and treatment. 	02 Hrs.

<p>13. FRACTURES:</p> <ul style="list-style-type: none"> • General principles of fractures, clinical presentation and treatment with additional reference to newer methods of fracture treatment. Special emphasis on fracture healing and rehabilitation. 	04 Hrs.
<p>14. PRINCIPLES OF OPERATIVE SURGERY:</p> <ul style="list-style-type: none"> • 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. 	04 Hrs.
<p>15. ANOMALIES OF DEVELOPMENT OF FACE:</p> <ul style="list-style-type: none"> • Surgical anatomy and development of face. • Cleft lip and cleft palate—principles of management. 	02 Hrs.
<p>16. DISEASES OF THYROID AND PARATHYROID:</p> <ul style="list-style-type: none"> • Surgical anatomy, pathogenesis, clinical features and management of dysfunction of thyroid and parathyroid glands. • Malignant diseases of the thyroid—classification, clinical features and management. 	05 Hrs.
<p>17. SWELLINGS OF THE JAW:</p> <ul style="list-style-type: none"> • Differential diagnosis and management of different types of swellings of the jaw. 	02 Hrs.
<p>18. BIOPSY:</p> <ul style="list-style-type: none"> • 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. 	01 Hr.

II. CLINICALS 90 Hrs.

D) SCHEME OF EXAMINATION

1. Internal Assessment - i) Theory : 10 marks
ii) Practical : 10 marks

2. Theory : 70 Marks

Distribution of Topics and Type of Questions:

Contents	Type of Questions and Marks	Marks
Infections Wounds Transmissible viral infections Anomalies of development of face Diseases of thyroid and parathyroid Swellings of the jaw Biopsy	MCQ's 2 X 1 mark 1 X 1 mark 1 X 1 mark 1 X 1 mark 2 X 1 mark 2 X 1 mark 1 X 1 mark	10 marks
Principles of Surgery, Tissue care, Asepsis and antisepsis, Sterilization, Suture materials, diathermy, Laser. Wounds – Classification, Clinical Assessment, Treatment, Complications, Wound Healing. Acute Infections – Non-specific and Specific Aerobic and Anaerobic abscess, Cellulites, Carbuncle, Erysipelas. Antrax, Gonorrhoea, gas Gangrene. Tetanus. Cancrum Oris, Ludwig's Angina. Bacteraemia, Septicemia, Pyaemia, Toxaemia Hemorrhage – Classification, emergency management, Definitive Treatment, Assessment of Blood Loss. Syncope, Shock, Cardiac Arrest – Causes, clinical Features, Haemodynamic Changes, emergency Care, Monitoring, Definitive Treatment, Septic Shock (warm shock), Anaphylaxis. Gangrene – Gas Gangrene, Dry Gangrene, Moist Gangrene – Causes, Management.	Long Essays 2 x 10 marks	20
Questions may be asked from all the topics	Short Essays 4 x 5 marks	20
Questions may be asked from all the topics	Short Answers 10 x 2 marks	20
Total		70

3. Viva Voce : 20 Marks

4. Clinicals : 90 Marks

Long Case : One which includes

- i. Case History : 10 marks
- ii. Clinical Examination : 30 marks
- iii. Suggested Investigation : 10 marks
- iv. Diagnosis, DD : 20 marks
- v. Management : 05 marks

E) RECOMMENDED BOOKS

1. Baily and Love- Short practice of Surgery-24th edition
2. Hamittion Baily's-Physical Signs
3. Das-Manual of Clinical Surgery

ORAL PATHOLOGY & MICROBIOLOGY

A) AIMS

The student should understand the underlying biological principles governing treatment of oral diseases.

B) OBJECTIVES

a) KNOWLEDGE & UNDERSTANDING

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

1. The different types of pathological processes, which involves 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 principles of certain basic aspects of Forensic Odontology.

b) 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.

C). COURSE CONTENT IN DETAIL – II & III BDS**I. Theory – Minimum Teaching Hours: 145 hrs (II BDS - 25 Hrs. III BDS - 120 Hrs)**

<p>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.</p>	1 Hr.
<p>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. 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.</p>	10 Hrs.
<p>3 Dental Caries: Etiopathogenesis, microbiology, clinical features, diagnosis, histopathology, immunology, prevention of dental caries & its sequelae.</p>	8 Hrs.
<p>4 Pulp & Periapical Pathology & Osteomyelitis. Etiopathogenesis and interrelationship, clinical features, microbiology, histopathology & radiological features (as appropriate) of pulp & periapical lesions and osteomyelitis. Sequelae of periapical abscess - summary of space infections, systemic complications & significance.</p>	8 Hrs.
<p>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.</p>	3 Hrs.
<p>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.</p>	10 Hrs.

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.	6 Hrs.
8	Diseases of TM Joint : . Ankylosis, summary of different types of arthritis & other developmental malformations, traumatic injuries & myofascial pain dysfunction syndrome.	3 Hrs.
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.	8 Hrs.
10	<p>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 :-</p> <p>a) Odontogenic - all lesions. b) Non-odontogenic</p> <p>- 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.</p> <p>c) Salivary Gland - Benign Epithelial neoplasms - Pleomorphic Adenoma, Warthin's tumour, & Oncocytoma. - Malignant Epithelial neoplasms - Adenoid Cystic Carcinoma, Mucoepidermoid Carcinoma, Acinic Cell Carcinoma & Adenocarcinomas.</p> <p>d) Tumours of Disputed Origin - Congenital Epulis & Granular Cell Myoblastoma.</p> <p>e) Metastatic tumours - Tumors metastasizing to & from oral cavity & the routes of metastasis.</p>	39 Hrs.

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 on oral cavity, summary of Physical & Chemical injuries including allergic reactions of the oral cavity. Healing of Oral wounds & complications - Dry socket.	13 Hrs.
12	Non neoplastic Salivary Gland Diseases : Sialolithiasis, Sialosis, Sialadenitis, Xerostomia & Ptyalism.	2 Hrs.
13	Systemic Diseases involving Oral cavity : Brief review & oral manifestations, diagnosis & significance of common Blood, Nutritional, Hormonal & Metabolic diseases of Oral cavity.	8 Hrs.
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.	10 Hrs.
15	Diseases of the Nerves: Facial neuralgias-Trigeminal & Glossopharyngeal. VII nerve paralysis, Causalgia. Psychogenic facial pain & Burning mouth syndrome.	3 Hrs.
16	Pigmentation of Oral & Paraoral region & Discolouration of teeth : causes & clinical manifestations.	2 Hrs.
17	Diseases of Maxillary Sinus : Traumatic injuries to sinus, Sinusitis, Cysts & Tumours involving antrum.	2 Hrs.
18	Biopsy: Types of Biopsy, value of biopsy, cytology, histochemistry & frozen sections in diagnosis of oral diseases.	6 Hrs.
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	3 Hrs.

II. Practicals : 130 Hours (II BDS - 50 Hrs. III BDS - 80 Hrs.)

1. Identification of Hard and Soft Tissue specimens
2. Demonstration of cytosmear and bacteriology smear
3. Identification of Microscopic slides of various Oral Lesions

Histopathologic Slides

1. Pit & Fissure caries
2. Smooth surface caries
3. Dental caries – Liquefaction Foci
4. Pulp Hyperemia
5. Pulp polyp
6. Pulpitis – Pulp Abscess
7. Periapical Granuloma – early cyst formation
8. Primordial Cyst
9. Dentigerous Cyst
10. Radicular Cyst
11. Cholesterol Clefts
12. Cholesterol Crystals
13. Rushton Bodies
14. Calcifying epithelial Odontogenic Cyst
15. Aneurysmal Bone Cyst
16. Mucocele
17. Hyperkeratosis
18. Leukoplakia
19. Candidal Leukoplakia
20. Carcinoma-in-Situ
21. Oral Submucous Fibrosis (H/E)
22. Oral Submucous Fibrosis (VG)
23. Fordyce's Spot
24. White Sponge Nevus
25. Papilloma
26. Fibroma
27. Lipoma
28. Capillary Hemangioma
29. Cavernous Hemangioma
30. Lymphangioma
31. Neurilemmoma
32. Poorly Differentiated Squamous Cell Carcinoma
33. Moderately Differentiated Squamous Cell Carcinoma
34. Well differentiated Squamous Cell Carcinoma
35. Verrucous Carcinoma
36. Malignant Melanoma
37. Osteosarcoma
38. Verruciform Xanthoma
39. Pyogenic Granuloma
40. Congenital Epulis
41. Fibrous Dysplasia

42. Ossifying Fibroma
43. Paget's disease
44. Osteomyelitis (acute)
45. Osteomyelitis (chronic)
46. Cancellous Osteoma
47. Peripheral Giant Cell Granuloma
48. Central Giant Cell Granuloma
49. Ameloblastoma (follicular)
50. Ameloblastoma (Plexiform)
51. Ameloblastoma (Granular Cell Variant)
52. Adenomatoid odontogenic tumour
53. Cementifying Fibroma (immature)
54. Cementoblastoma
55. Ameloblastic Fibroma (H/E)
56. Compound Odontome
57. Pleomorphic Adenoma
58. Pleomorphic Adenoma with Metaplastic areas
59. Warthin's Tumour
60. Mucoepidermoid Carcinoma (high grade)
61. Mucoepidermoid Carcinoma (low grade)
62. Adenoid cystic Carcinoma (PAS)
63. Necrotizing Sialometaplasia
64. Lichen Planus with Civatte Bodies
65. Pemphigus

D) SCHEME OF EXAMINATION

1. Internal Assessment : i) Theory : 10 Marks
ii) Practical : 10 Marks

2. Theory : 70 Marks

Distribution of Topics and Type of Questions:

Contents	Type of Questions and Marks	Marks
Oral Pathology Oral microbiology	MCQ's 8 x 1 mark 2 x 1 mark	10
Oral Pathology	Long Essays 2 x 10 marks	20
Oral Pathology Oral microbiology	Short Essays 3 x 5 marks 1 x 5 marks	20
Oral Pathology Oral microbiology	Short Answers 6 x 2 marks 4 x 2 marks	20
	Total	70

3. Viva Voce : 20 Marks

4. Practicals : 90 Marks

Spotters

1. Specimen: Identification & points in Support 6x5 = 30 marks
2. Slides : Slides, diagrams, Labelling & Salient features, 12 slides 12x5 = 60 marks

E) RECOMMENDED BOOKS

1. Shafer, Hine & Levy - A Text Book of Oral Pathology – 7th edition
2. Regezi & Sciubba - Oral Pathology - Clinical Pathologic correlations – 5th edition
3. Soames & Southam - Oral Pathology – 4th edition
4. Prabhu, Wilson, Johnson & Daftary - Oral Pathology in the Tropics – 1st edition
5. Neville, Damn, Allen, Bonquot – Oral and Maxillo-facial Pathology – 3rd edition

ORAL MEDICINE AND RADIOLOGY

INTRODUCTION

Oral medicine is the specialty concerned with diagnosis and medical management of the oral and the facial region, including orofacial manifestations of systemic diseases. The latter include gastrointestinal, dermatological, rheumatological and haematological diseases, autoimmune and immunodeficiency disorders and the manifestations of neurological or psychiatric disease.

As defined by the American Dental Association, Oral and Maxillofacial Radiology is the specialty of dentistry and discipline of radiology concerned with production and interpretation of images and data produced by all modalities of radiant energy that are used for the diagnosis and management of diseases, disorders and conditions of the oral and maxillofacial region

A) GOAL

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 and other imaging methods in diagnosis.
3. The principles of the clinical and radiographic aspects of Forensic Odontology.

B) OBJECTIVES

a. Knowledge and Understanding:

Oral cavity is the mirror of the human body and this is streamlined to specialists in oral medicine. Oral Medicine is a specialist clinical area of care for treating head and neck medical diseases. In some instances, mouth symptoms and signs reflect problems only in the mouth. However, in some cases mouth symptoms can suggest a connection with disease or problems in other parts of the body and it is the Oral Medicine specialist who can best decide what tests or investigations are needed in these situations.

b. Need for the course

Conditions managed in Oral Medicine are often chronic and may have a significant psychological, as well as physical impact on the patient's quality of life. Some of these

conditions also involve other diseases in the body, and in these cases the oral medicine specialist works as part of a multi-disciplinary patient care team.

c. Scope:

The expansive dental and medical knowledge imparted in the Oral Medicine and Radiology course allows the clinician for comprehensive assessment, diagnosis, and non-surgical management of varied and challenging oral and paraoral oral diseases and is a prerequisite to routine dental practice. Also, opportunities as an educator or a researcher in local, national and international arenas are created for specialists in Oral Medicine and Radiology. The advancements in this field has revolutionized the manner in which oral diagnosis is made and appropriate treatment rendered.

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.

C) COURSE CONTENT IN DETAIL

I. Theory Minimum Teaching Hours: 65 Hrs.

III BDS-20 Hrs. IVBDS-45 Hrs

- 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.

<p>PART-I ORAL MEDICINE AND DIAGNOSTIC AIDS SECTION (A) – DIAGNOSTIC METHODS</p> <ul style="list-style-type: none"> • Definition and importance of Diagnosis and various types of diagnosis • Method of clinical examinations. <ul style="list-style-type: none"> ○ General Physical examination ○ Examination of oro-facial region by inspection, palpation and other means ○ To train the students about the importance, role, uses of saliva and techniques of diagnosis of saliva as part of oral disease ○ Examination of lesions like swellings, ulcers, erosions, sinus, fistula, 	<p>10 Hrs.</p>
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<p>growths, pigmented lesions, white and red patches</p> <ul style="list-style-type: none"> ○ Examination of lymph nodes ○ Forensic examination – Procedures for post-mortem dental examination; maintaining dental records and their use in dental practice and post-mortem, identification; jurisprudence and ethics. <ul style="list-style-type: none"> ● Investigations <ul style="list-style-type: none"> ○ Biopsy and exfoliative cytology ○ Hematological, Microbiological and other tests and investigations necessary for diagnosis and prognosis 	
<p>SECTION (B) – DIAGNOSIS, DIFFERENTIAL DIAGNOSIS</p> <p>While learning the following chapters, emphasis shall be given only on diagnostic aspects including differential diagnosis</p> <ul style="list-style-type: none"> ● Teeth: Developmental abnormalities- causes of destruction of teeth and their sequelae and discoloration of teeth ● Diseases of bone and Osteodystrophies: Developmental disorders: Anomalies, Exostosis and tori, infantile cortical hyperostosis, osteogenesis imperfecta, Marfans syndrome, osteopetrosis. Inflammation – Injury, infection and spread of infection, fascial space infections, osteoradionecrosis. <p>Metabolic disorders – Langerhan’s cell Histiocytosis Endocrine – Acromegaly and hyperparathyroidism [Miscellaneous – Paget’s disease, Mono and polyostotic fibrous dysplasia, Cherubism.</p> <ul style="list-style-type: none"> ● Temporomandibular Joint: Developmental abnormalities of the condyle. Rheumatoid arthritis, Osteoarthritis, Sub-luxation and luxation. ● Common cysts and Tumors: <ul style="list-style-type: none"> ○ CYSTS: Cysts of soft tissue: Mucocele and Ranula Cysts of bone: Odontogenic and nonodontogenic ○ TUMORS: <ul style="list-style-type: none"> Soft Tissue: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> Non Odontogenic : Osteoma, Osteosarcoma, Osteoclastoma, Chondroma, Chandrosarcoma, Central giant cell tumor, and Central haemangioma Odontogenic : Enameloma, Ameloblastoma, Calcifying Epithelial 	<p>15 Hrs.</p>

<p style="text-align: center;">Odontogenic tumor, Adenomatoid Odontogenic tumor, Periapical cemental dysplasia and odontomas</p> <ul style="list-style-type: none"> • Periodontal diseases: Gingival hyperplasia, gingivitis, periodontitis, pyogenic granuloma • Granulomatous diseases: Tuberculosis, Sarcoidosis, Midline lethal granuloma, Crohn’s Disease and Langerhan’s cell Histiocytosis • Miscellaneous Disorders: Burkitt’s lymphoma, Sturge – Weber syndrome, CREST syndrome, Rendu-Osler-Weber syndrome 	
<p>SECTION (C): ORAL MEDICINE AND THERAPEUTICS</p> <p>The following chapters shall be studied in detail including the etiology, pathogenesis, clinical features, investigations, differential diagnosis, management and prevention</p> <ul style="list-style-type: none"> • Infections of oral and paraoral structures: <ul style="list-style-type: none"> ○ 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 • Important common mucosal lesions: <ul style="list-style-type: none"> ○ White lesions: Chemical burns, leukodema, leukoplakia, fordyce’s 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. • Cervico-facial lymphadenopathy • Facial pain: <ul style="list-style-type: none"> ○ 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., ○ Pain arising due to C.N.S. diseases: 	<p>15 Hrs.</p>

<p>(a) Pain due to intracranial and extracranial involvement of cranial nerves. (Multiple sclerosis, cerebrovascular diseases, Trotter's syndrome etc.)</p> <p>(b) Neuralgic pain due to unknown causes: Trigeminal neuralgia, glossopharyngeal neuralgia, sphenopalatine ganglion neuralgia, periodic migrainous neuralgia and atypical facial pain</p> <ul style="list-style-type: none"> ○ Referred pain: Pain arising from distant tissues like heart, spine etc., <ul style="list-style-type: none"> ● Altered sensations: Cacogeusia, halitosis <ul style="list-style-type: none"> ● 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.) <ul style="list-style-type: none"> ● Oral manifestations of: <ul style="list-style-type: none"> ○ Metabolic disorders: <ul style="list-style-type: none"> (a) Porphyria (b) Haemochromatosis (c) Langerhan's cell Histiocytosis ○ Endocrine disorders: <ul style="list-style-type: none"> (a) Pituitary: Gigantism, acromegaly, hypopituitarism (b) Adrenal cortex: Addison's disease (Hypofunction) Cushing's syndrome (Hyperfunction) (c) Parathyroid glands: Hyperparathyroidism. (d) Thyroid gland: (Hypothyroidism) Cretinism, myxedema (e) Pancreas: Diabetes Mellitus ○ Nutritional deficiency: Vitamins: riboflavin, nicotinic acid, folic acid Vitamin B12, Vitamin C (Scurvy) ○ Blood disorders: <ul style="list-style-type: none"> (a) Anaemia Deficiency 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 mononucleosis and leukemias (c) Hemorrhagic disorders: Thrombocytopenia, purpura, hemophilia, Christmas disease and von Willebrand's disease ● Disease of salivary glands: <ul style="list-style-type: none"> ○ Developmental disturbances: Aplasia, atresia and aberration ○ Functional disturbances: Xerostomia, ptyalism ○ Inflammatory conditions: Nonspecific sialadenitis, mumps, sarcoidosis 	
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<ul style="list-style-type: none"> ○ Heerfordt's syndrome (Uveoparotid fever), Necrotizing sialometaplasia ○ Cysts and tumors: Mucocele, ranula, pleomorphic adenoma, mucoepidermoid carcinoma ○ Miscellaneous: Sialolithiasis, Sjogren's syndrome, Mikulicz's disease and sialosis ● Dermatological diseases with oral manifestations: <ul style="list-style-type: none"> ○ Ectodermal dysplasia ○ Hyperkeratosis palmar plantaris with periodontopathy ○ Scleroderma ○ Lichen planus including Grinspan's syndrome ○ Lupus erythematosus ○ Pemphigus ○ Erythema multiforme ○ Psoriasis ● Immunological diseases with oral manifestations <ul style="list-style-type: none"> ○ Leukemia ○ Lymphomas ○ Multiple myeloma ○ AIDS clinical manifestations, opportunistic infections, neoplasms ○ Thrombocytopenia ○ Lupus erythematosus ○ Scleroderma ○ Dermatomyositis ○ Oral Submucous fibrosis ○ Rheumatoid arthritis ○ Recurrent oral ulcerations including Behcet's syndrome and Reiter's syndrome ● Allergy: Local allergic reactions, anaphylaxis, serum sickness (local and systemic allergic manifestations to food ,drugs and chemicals) ● Foci of oral infection and their ill effects on general health Management of dental problems in medically compromised persons: <ul style="list-style-type: none"> (a) Physiological changes: Puberty, pregnancy and menopause (b) The patients suffering with cardiac, respiratory, liver, kidney and bleeding disorders, hypertension, diabetes and AIDS. Post-irradiated patients. ● Precancerous lesions and conditions ● Nerve and muscle diseases: <ul style="list-style-type: none"> ○ Nerves <ul style="list-style-type: none"> (a) Neuropraxia (b) Neurotemesis (c) Neuritis (d) Facial nerve paralysis including Bell's palsy, Heerfordt's syndrome, Melkerson Rosenthal syndrome and Ramsay Hunt syndrome (e) Neuroma (f) Neurofibromatosis (g) Frey 'syndrome ○ Muscles <ul style="list-style-type: none"> (a) Myositis ossificans 	
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<p>(b) Myofascial pain dysfunction syndrome (c) Trismus</p> <ul style="list-style-type: none"> • Forensic odontology: <ul style="list-style-type: none"> ○ Medico legal aspects of orofacial injuries ○ Identification of bite marks ○ Determination of age and sex ○ Identification of cadavers by dental appliances, Restorations and tissue remnants • Therapeutics: General therapeutic measures – drugs commonly used in oral medicine viz., antibiotics, chemotherapeutic agents, anti-inflammatory and analgesic drugs, astringents, mouth washes, styptics, demelucents, local surface anaesthetic, sialogogues, antisialogogues and drugs used in the treatment of malignancy. • Dental management of Medically Compromised Patients 	
<p>PART II BEHAVIORAL SCIENCES & ETHICS</p>	
<p>Part – III ORAL RADIOLOGY</p> <ul style="list-style-type: none"> • Scope of the subject and history of origin • Physics of radiation: <ul style="list-style-type: none"> ○ Nature and types of radiations ○ Source of radiations ○ Production of X- rays ○ Properties of X-rays ○ Compton effect ○ Photoelectric effect ○ Radiation measuring units • Biological effects of radiation • Radiation safety and protection measures • Principles of image production • Radiographic techniques: <ul style="list-style-type: none"> ○ Intra-Oral <ul style="list-style-type: none"> (a) Periapical radiographs (Bisecting and paralleling techniques) (b) Bite wing radiographs (c) Occlusal radiographs ○ Extra-oral <ul style="list-style-type: none"> (a) Lateral projections of skull and jaw bones and paranasal sinuses (b) Cephalograms (c) Orthopantomograph (d) Projections of temporomandibular joint and condyle of mandible (e) Projections for Zygomatic arches ○ Specialized techniques <ul style="list-style-type: none"> (a) Sialography (b) Xeroradiography (c) Tomography (d) Computed Tomography (CT) 	<p>30 Hrs.</p>

<p>(e) Magnetic Resonance Imaging (MRI) (f) Cone Beam Computed Tomography (CBCT) (g) Ultrasonography (USG)</p> <ul style="list-style-type: none"> • Factors in production of good radiographs: <ul style="list-style-type: none"> ○ kVp and mA of X-ray machine ○ Filters ○ Collimators ○ Intensifying screens ○ Grids ○ X-ray films ○ Exposure time ○ Techniques ○ Dark room ○ Developer and fixer solutions ○ Film processing • Radiographic normal anatomical landmarks • Faulty radiographs and artifacts 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 postmortem radiographic methods 	
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II. Practicals / Clinicals: 170 Hrs

1. 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.

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 following is the minimum of prescribed work for recording
 - a) Recording of detailed case histories of interesting cases 10
 - b) Intra-oral radiographs (Periapical, bitewing, occlusal) 25
 - c) Saliva diagnostic check as routine procedure

D) SCHEME OF EXAMINATION**1. Internal Assessment - i) Theory : 10 marks****ii) Practical: 10 marks****2. Theory : 70 Marks****Distribution of Topics and Type of Questions:**

Contents	Type of Questions and Marks	Marks
Oral Medicine Oral Radiology	MCQ's 6 X1 marks 4 x 1 marks	10
Oral Medicine Oral Radiology	Long Essays 1 x 10 marks 1 x 10 marks	20
Oral Medicine Oral Radiology	Short Essays 2 x 5 marks 2 x 5 marks	20
Oral Medicine Oral Radiology	Short Answers 6 x 2 marks 4 x 2 marks	20
Total		70

3. Viva Voce : 20 Marks**4. Clinicals : 90 Marks**

I) Clinicals in Oral Medicine: 60 Marks (recording of Long Case)

- a) Case History : 25 Marks
- b) Diagnosis & Differential Diagnosis : 15 Marks
- c) Investigations : 10 Marks
- d) Management : 10 Marks

II) Clinicals in Radiology: 30 Marks (One Intra-oral Periapical Radiograph)

- a) Technique : 15 Marks
- b) Processing : 05 Marks
- c) Interpretation : 10 Marks

E) RECOMMENDED BOOKS

a) Oral Diagnosis, Oral Medicine & Oral Pathology

1. Greenberg M.S., Glick M, Ship J.A. Burket's Oral Medicine, Diagnosis and Treatment- 9th, 10th, and 11th Edition – J.B. Lippincott Company
2. Burket's Oral Medicine, Diagnosis and Treatment- 12th Edition, Michel Glick.
3. Coleman G.C.– Principles of Oral Diagnosis –1st Edition- Mosby Year Book
4. Harold Jones J and Mason D.K – Oral Manifestations of Systemic Diseases -1st Edition– W.B. Saunders company
5. Mitchell – Oral Diagnosis & Oral Medicine
6. Kerr – Oral Diagnosis
7. Miller – Oral Diagnosis & Treatment
8. Swash.M. Hutchinson 's clinical Methods -21st Edition
9. R.Rajendran and B.Sivapathasundharam. Shafer's Oral Pathology – 6th Edition
10. Sonis.S.T., Fazio.R.C. and Fang.L - Principles and practice of Oral Medicine-2nd Edition
11. Clinical Manual – Das
12. Steven L Bricker, Robert P Langlais, Craig S Miller- Oral Diagnosis, Oral Medicine and Treatment. (Second Edition), Publishers: CBS publishers and Distributors Pvt Ltd. BC Decker Inc, Hamilton London.

b) Oral Radiology

1. White S.C& Pharoah M.J. Oral Radiology : Principles and Interpretation– 6th Edition - Mosby year Book
2. Wuehrmann– Dental Radiology – C.V. Mosby Company
3. Gibilisco J.A. Stafne's Oral Roentgenographic Diagnosis –5th Edition- W.B.Saunders Co.,
4. Eric Whaites, Nicholas Drage; Essentials of Dental Radiography and Radiology, 5th Edition, Publisher- Churchill Livingstone. (Elsevier)

c) Forensic Odontology

1. Derek H.Clark – Practical Forensic Odontology - Butterworth-Heinemann
2. C Michael Bowers, Gary Bell – Manual of Forensic Odontology - Forensic Pr(1995)
3. Text Book of Forensic Odontology-KMK Masthan, 1st Edition, Jaypee Publications
4. Text Book of Forensic Odontology- Nitmal Jain, 1st edition, Jaypee publications
5. Forensic Dentistry- Senn & Stimson- 2nd edition, CRC Press
6. Manual of Forensic Odontology- Senn & Weems, 5th edition, CRC Press

PEDODONTICS & PREVENTIVE DENTISTRY

A) GOAL

The dental graduates during training in Pediatric & Preventive Dentistry should acquire adequate knowledge, necessary skills and such attitudes which are required for carrying out Pedodontic patients involving the prevention, diagnosis and treatment of anomalies and diseases of the teeth, mouth, jaws and associated tissues.

B) OBJECTIVES

The objectives are dealt under three headings namely (a) Knowledge and understanding (b) Skills , (c) Attitudes and (d)Aptitude-Multiple Choice Questions.

a) KNOWLEDGE AND UNDERSTANDING

1. The graduate should acquire adequate knowledge of the scientific foundations on which Pediatric Dentistry is based and good understanding of various relevant scientific methods, principles of biological functions and should be able to evaluate and analyse scientifically various established facts and data.
2. They should also acquire 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 the bearing on physical and social well-being of the patient.

b) SKILLS

1. Able to diagnose and manage various common dental problems in children 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 skill to prevent and manage complications if encountered while carrying out various dental surgical and other procedures.

C) COURSE CONTENT IN DETAIL**I. Theory: Minimum Teaching Hours: 65 Hrs. (III Year – 20 Hrs.; IV Year-45 Hrs.)**

1. INTRODUCTION TO PEDIATRIC & PREVENTIVE DENTISTRY. <ul style="list-style-type: none"> • Definition, Scope, Objectives and Importance. 	01 Hr.
2. GROWTH & DEVELOPMENT: <ul style="list-style-type: none"> • 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. 	02 Hrs.
3. DEVELOPMENT OF OCCLUSION FROM BIRTH THROUGH ADOLESCENCE- <ul style="list-style-type: none"> • Study of variations and abnormalities 	03 Hrs.
4. DENTAL ANATOMY AND HISTOLOGY: <ul style="list-style-type: none"> • 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. 	03 Hrs.
5. DENTAL RADIOLOGY RELATED TO PEDIATRIC & PREVENTIVE DENTISTRY	01 Hr.
6. ORAL SURGICAL PROCEDURES IN CHILDREN. <ul style="list-style-type: none"> • Indications and contraindications of extractions of primary and permanent teeth in children • Knowledge of Local and General Anesthesia • Minor surgical procedures in children 	02 Hrs.
7. DENTAL CARIES: <ul style="list-style-type: none"> • Historical background • Definition, aetiology & pathogenesis • Caries pattern in primary, young permanent and permanent teeth in Children • Rampant caries, early childhood caries and extensive caries: <ul style="list-style-type: none"> ○ Definition, aetiology, Pathogenesis, Clinical features, Complications & Management • Role of diet and nutrition in Dental Caries. 	04 Hrs.

<ul style="list-style-type: none"> • Dietary modifications & Diet counseling. • Caries activity, tests, caries prediction, caries susceptibility & their clinical application 	
<p>8. GINGIVAL & PERIODONTAL DISEASES IN CHILDREN.</p> <ul style="list-style-type: none"> • Normal gingiva & periodontium in children • Definition, aetiology & Pathogenesis • Prevention & Management of gingival & Periodontal diseases 	02 Hrs.
<p>9. CHILD PSYCHOLOGY:</p> <ul style="list-style-type: none"> • 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 	03 Hrs.
<p>10. BEHAVIOUR MANAGEMENT:</p> <ul style="list-style-type: none"> • Definitions. • Types of behaviour encountered in the dental clinic. • Non-pharmacological & pharmacological methods of Behaviour Management 	03 Hrs.
<p>11. PEDIATRIC OPERATIVE DENTISTRY:</p> <ul style="list-style-type: none"> • 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. 	04 Hrs.
<p>12. PEDIATRIC ENDODONTICS</p> <ul style="list-style-type: none"> • Principles & Diagnosis. • Classification of Pulpal Pathology in primary, young permanent & permanent teeth. • Management of Pulpally involved primary, young permanent & permanent teeth. <ul style="list-style-type: none"> ○ Pulp capping – direct & indirect. ○ Pulpotomy ○ Pulpectomy 	04 Hrs.

<ul style="list-style-type: none"> ○ Apexogenesis ○ Apexification ● Obturation Techniques & material used for primary, young permanent & Permanent teeth in children. 	
<p>13. TRAUMATIC INJURIES IN CHILDREN</p> <ul style="list-style-type: none"> ● Classifications & Importance ● Sequelae & reaction of teeth to trauma ● Management of Traumatized teeth 	03 Hrs.
<p>14. PREVENTIVE & INTERCEPTIVE ORTHODONTICS</p> <ul style="list-style-type: none"> ● Definitions ● Problems encountered during primary and mixed dentition phases & their management. ● Serial extractions. ● Space management. 	04 Hrs.
<p>15. ORAL HABITS IN CHILDREN</p> <ul style="list-style-type: none"> ● Definition, Aetiology & Classification. ● Clinical features of digit sucking, tongue thrusting, mouth breathing & various other secondary habits. ● Management of oral habits in children 	03 Hrs.
<p>16. DENTAL CARE OF CHILDREN WITH SPECIAL NEEDS</p> <ul style="list-style-type: none"> ● Definition, Aetiology, Classification, Behavioural and Clinical features & Management of children with <ul style="list-style-type: none"> ○ Physically handicapping conditions ○ Mentally compromising conditions ○ Medically compromising conditions ○ Genetic disorders 	03 Hrs.
<p>17. CONGENITAL ABNORMALITIES IN CHILDREN</p> <ul style="list-style-type: none"> ● Definition, Classification, Clinical features & Management 	02 Hrs.
<p>18. DENTAL EMERGENCIES IN CHILDREN & THEIR MANAGEMENT</p>	02 Hrs.
<p>19. DENTAL MATERIALS USED IN PEDIATRIC DENTISTRY</p>	02 Hrs.

20. PREVENTIVE DENTISTRY <ul style="list-style-type: none"> • Definition. • Principles & Scope. • Types of prevention. • Different preventive measures used in Pediatric Dentistry including pit and fissure sealants and caries vaccine 	03 Hrs.
21. DENTAL HEALTH EDUCATION & SCHOOL DENTAL HEALTH PROGRAMMES	03 Hrs.
22. FLUORIDES <ul style="list-style-type: none"> • Historical background • Systemic & Topical fluorides • Mechanism of action • Toxicity & Management • Defluoridation techniques 	03 Hrs.
23. CASE HISTORY RECORDING <ul style="list-style-type: none"> • Outline of principles of examination, diagnosis & treatment planning 	03 Hrs.
24. SETTING UP OF PEDODONTIC CLINIC	01 Hr.
25. ETHICS	01 Hr.

II. Practicals : 200 Hrs.

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

Education & motivation of the patients using disclosing agents. Educating patients about oral hygiene measures like tooth brushing, flossing etc.

D) SCHEME OF EXAMINATION

1. Internal Assessment – i) Theory : 10 Marks
ii) Practicals : 10 marks

2. Theory : 70 Marks

Distribution of Topics and Type of Questions:

Contents	Type of Questions and Marks	Marks
Pediatric Endodontics Pediatric Traumatology Early childhood caries Space management Others	MCQ's 10X1 marks	10
One Question from the following topics: Behaviour Management Dental caries Pediatric operative dentistry-Restorations of decayed primary, young permanent teeth in children Pediatric endodontic Development of Occlusion from birth through adolescence One Question from the following topics: Traumatic injuries in children. Oral habits in children Dental care of children with special needs Gingival & Periodontal diseases in children. Oral Surgical procedures in children.	Long Essays 2 x 10 marks	20
Introduction to Pediatric and Preventive Dentistry Growth & Development Dental care of children with special needs (Genetic Aspects) Chronology of eruption of teeth Case history recording Setting up of Pedodontic Clinic Dental anatomy and Histology-Management of developmental and acquired disturbances of teeth Dental care of children with special needs –	Short Essays 4 x 5 marks	20

medically compromising conditions Oral Manifestations of systemic diseases Oral Surgical procedures in children Management of pain Dental anatomy and histology-Teething Disorders		
Questions may be asked from all the topics	Short Answers 10 x 2 marks	20
Total		70

3. Viva Voce : 20 Marks

4. Clinical Examination : 90 Marks

Clinical Examination consists of two exercises:

EXERCISE 1 : Marks Allotted : 25
(Common for all students)

- Clinical Examination and recording of Long Case History 10 Marks
- Diagnosis, Treatment planning & Management 15 Marks

EXERCISE 2 : Marks Allotted : 65
(Any one of the following Exercise – by lot)

- 1) Oral Prophylaxis & Fluoride Application
 - Management of Child Marks - 10
 - Oral Prophylaxis Marks - 25
 - Topical Fluoride Application Marks - 25
 - Post Operative Instructions Marks - 05
- 2) Restoration of Tooth
 - Management of Child Marks - 10
 - Cavity Preparation Marks - 25
 - Isolation, Lining, Matrix Band Application Marks - 15
 - Filling, Carving & Finishing Marks - 10
 - Post-operative Instructions Marks - 05
- 3) Extraction of tooth
 - Management of Child Marks - 10
 - Local Anesthesia Marks - 20

– Extraction	Marks - 25
– Prescription	Marks - 05
– Post-operative Instructions	Marks - 05

E) RECOMMENDED BOOKS

1. Pinkham - Pediatric Dentistry (Infancy through Adolescence) – 5th edition
2. Kennedy & Curzon - Kennedy's Pediatric Operative Dentistry – 3rd edition
3. Stephen H. Wei.- Occlusal guidance in Pediatric Dentistry –
4. Stephen H. Wei - Clinical Use of Fluorides –
5. Kaban-Pediatric Oral & Maxillofacial Surgery – 1st edition
6. P. S. What-Pediatric Medical Emergencies –
7. Niki Foruk - Understanding of Dental Caries – 1st edition
8. G. J. Mount - An Atlas of Glass Ionomer cements –
9. Finn-Clinical Pedodontics – 4th edition
10. Braham Morris-Textbook of Pediatric Dentistry – 2nd edition
11. Norman O. Harris - Primary Preventive Dentistry – 3rd edition
12. Kenneth. D-Handbook of Clinical Pedodontics –
13. Forrester-Preventive Dentistry – 2nd edition
14. Garry M. Whitford-The Metabolism and Toxicity of Fluoride –
15. Mc. Donald-Dentistry for the Child and Adolescence – 9th edition
16. Damle S. G- Pediatric Dentistry – 3rd edition
17. Wright - Behaviour Management – 1st editon
18. Mathewson - Pediatric Dentistry – 3rd edition
19. Andreason - Traumatic Injuries – 2nd edition
20. Nakata-Occlusal guidance in Pediatric Dentistry –
21. Tomare - Pediatric Drug Therapy –
22. Profitt - Contemporary Orhtodontics – 4th edition
23. Depaola - Preventive Dentistry –
24. Whitford. G. M - Metabolism & Toxicity of Fluoride –
25. Grossman - Endodontic Practice – 11th edition
26. Munford - Principles of Endodontics – 1st edition
27. Ingle - Endodontics – 5th edition
28. Cohen - Pathways of Pulp – 9th edition
29. Hargreaves - Management of Traumatized anterior Teeth –

ORTHODONTICS & DENTOFACIAL ORTHOPEDICS

A) GOAL

To train a Dental student into a skillful and knowledgeable Dental Surgeon with sound knowledge of Orthodontic Diagnosis and treatment planning.

B) OBJECTIVES

d. Knowledge and Understanding:

To understand etiology, physiology, diagnosis and treatment planning of various common orthodontic problems. Understanding the management of mild to moderate malocclusions.

e. Need of the course and skill enhancement:

To obtain proper theoretical and clinical training, including case history taking performing essential diagnostic procedures their interpretation and finally arriving at a comprehensive treatment plan.

To be competent in fabricating removable appliances for the management of mild to moderate malocclusions.

f. Scope:

Meticulous training and education which will equip the students with knowledge and skill at the completion of the course and further lay strong foundation to proceed towards postgraduate course.

C) COURSE CONTENT IN DETAIL

I. Theory: Minimum Teaching Hours: 50 Hrs. (III BDS- 20 Hrs. ; IV BDS- 30 Hrs)

<p>1. Introduction</p> <ul style="list-style-type: none"> • Definition, Historical Background, Aims and Objectives of Orthodontics and Need For Orthodontic Care. 	<p>01 Hr.</p>

<p>2. Growth And Development: In General</p> <ul style="list-style-type: none"> • Definition • Growth spurts and Differential growth • Factors influencing growth and Development • Methods of measuring growth • Growth theories (Genetic, Sicher's, Scott's, Moss's, Petrovics, Multifactorial) • Genetic and epigenetic factors in growth • Cephalocaudal gradient in growth 	04 Hrs.
<p>3. Morphologic Development Of Craniofacial Structures</p> <ul style="list-style-type: none"> • Methods of bone growth • Prenatal growth of craniofacial structures • Postnatal growth and development of: cranial base, maxilla, mandible, dental • Development of dental Arches and occlusion. 	03 Hrs.
<p>4. Functional Development Of Dental Arches And Occlusion</p> <ul style="list-style-type: none"> • Factors influencing functional development of dental arches and occlusion. • Forces of occlusion • Wolfe's law of transformation of bone • Trajectories of forces 	02 Hrs.
<p>5. Clinical Application Of Growth And Development</p>	01 Hr.
<p>6. Malocclusion - In General</p> <ul style="list-style-type: none"> • Concept of normal occlusion • Definition of malocclusion • Description of different types of dental, skeletal and functional malocclusion. 	02 Hrs.
<p>7. Classification Of Malocclusion</p> <ul style="list-style-type: none"> • Principle, description, advantages and disadvantages of classification of malocclusion by Angle's, Modification of Angle's classification, Simon's, Lischer's and Ackerman and Proffitt's. 	01 Hrs.
<p>8. Normal And Abnormal Function Of Stomatognathic System</p>	02 Hrs.

<p>9. Etiology Of Malocclusion</p> <ul style="list-style-type: none"> • Definition, importance, classification, local and general etiological factors. • Etiology of following different types of malocclusion: <ul style="list-style-type: none"> • Midline diastema • Spacing • Crowding • Cross-Bite: Anterior/Posterior • Class III Malocclusion • Class II Malocclusion • Deep Bite • Open bite 	02 Hr.
<p>10. Diagnosis And Diagnostic Aids</p> <ul style="list-style-type: none"> • Definition, Importance and classification of diagnostic aids • Importance of case history and clinical examination in orthodontics • Study Models: - Model analysis: Pont's, Ashley Howe's, Bolton, Careys arch perimeter analysis, Moyer's Mixed Dentition Analysis • Study models-Importance and uses - Preparation and preservation of study models • Importance of intraoral X-rays in orthodontics • Panoramic radiographs: - Principles, Advantages, disadvantages and uses • Cephalometrics: Its advantages, disadvantages <ol style="list-style-type: none"> 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 • Electromyography and its uses in orthodontics • Wrist X-rays and its importance in orthodontics 	05 Hrs.
<p>11. General Principles In Orthodontic Treatment Planning Of Dental and Skeletal Malocclusions</p>	01 Hrs.
<p>12. Anchorage In Orthodontics –</p> <ul style="list-style-type: none"> • Definition, • Classification • Types and • Stability Of • Anchorage 	02 Hrs.

<p>13. Biomechanical Principles In Orthodontic Tooth Movement</p> <ul style="list-style-type: none"> • Biology of tooth movement • Different types of tooth movements • Tissue response to orthodontic force application • Age factor in orthodontic tooth movement 	02 Hrs.
<p>14. Preventive Orthodontics</p> <ul style="list-style-type: none"> • Definition • Different procedures undertaken in preventive orthodontics and their limitations. 	01 Hr.
<p>15. Interceptive Orthodontics</p> <ul style="list-style-type: none"> • Definition • Different procedures undertaken in interceptive orthodontics • Serial extractions: Definition, indications, contra-indication, technique, advantages and disadvantages. • Role of muscle exercises as an interceptive procedure 	01 Hr.
<p>16. Corrective Orthodontics</p> <ul style="list-style-type: none"> • Definition, factors to be considered during treatment planning. • Methods of gaining space in the arch:- Indications, relative merits and demerits of proximal stripping • Extractions in Orthodontics - indications and selection of teeth for extraction. • Arch expansion 	05 Hr.
<p>17. Orthodontic Appliances: General</p> <ul style="list-style-type: none"> • Requisites for orthodontic appliances • Classification, indications of Removable and Functional Appliances • Methods of force application • 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. • Preliminary knowledge of acid etching and direct bonding. 	04 Hr.
<p>REMOVABLE ORTHODONTIC APPLIANCES</p> <ul style="list-style-type: none"> • Components of removable appliances • Different types of clasps and their uses • Different types of labial bows and their uses • Different types of springs and their uses 	03 Hrs.
<p>FIXED ORTHODONTIC APPLIANCES</p> <ul style="list-style-type: none"> • Definition, Indications & Contraindications 	01 Hrs.

<ul style="list-style-type: none"> • Component parts and their uses • Basic principles of different techniques: Edgewise, Begg's, straight wire. 	
<p>EXTRAORAL APPLIANCES</p> <ul style="list-style-type: none"> • Headgears • Chin cup • Reverse pull headgears 	01 Hrs.
<p>MYOFUNCTIONAL APPLIANCES</p> <ul style="list-style-type: none"> • Definition and principles • Muscle exercises and their uses in orthodontics • Functional appliances: <ul style="list-style-type: none"> • Activator, Oral screens, Frankels function regulator, Bionator, Twin blocks, Lip bumper • Inclined planes - upper and lower 	02 Hrs.
18. Orthodontic Management Of Cleft Lip And Palate	01 Hrs.
<p>19. Principles Of Surgical Orthodontics</p> <p>Brief knowledge of correction of:</p> <ul style="list-style-type: none"> • Mandibular Prognathism and Retrognathism • Maxillary Prognathism and Retrognathism • Anterior open bite and deep bite • Cross bite • Minor surgical procedures 	01 Hrs.
<p>20. Principle, Differential Diagnosis & Methods Of Treatment of:</p> <ul style="list-style-type: none"> • Midline diastema • Cross bite • Open bite • Deep bite • Spacing • Crowding • Class II - Division 1, Division 2 • Class III Malocclusion - True and Psuedo Class III 	04 Hrs.
<p>21. Retention And Relapse</p> <ul style="list-style-type: none"> • Definition • Need for retention • Causes of relapse • Methods of retention 	01 Hrs.

<ul style="list-style-type: none"> • Different types of retention devices • Duration of retention • Theories of retention 	
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II. Practicals and Clinicals 170

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 an equilateral triangle
3. Bending of a rectangle
4. Bending of a square
5. Bending of a circle
6. Bending of U.V. Pattern

II. Construction of Clasps (Both sides upper/lower) Gauge 22 or 0.7mm

7. 3/4 Clasp (C-Clasp)
8. Full Clasp (Jackson's Crib)
9. Adam's Clasp
10. Triangular Clasp

III. Construction of Springs (on upper both sides) Gauge 24 or 0.5mm

11. Finger Spring
12. Single Cantilever Spring
13. Double Cantilever Spring (Z-Spring)
14. T-Springs on premolars

IV. Construction of Canine retractors Gauge 23 or 0.6mm

15. U - Loop canine retractor (Both sides on upper & lower)
16. Helical canine retractor (Both sides on upper & lower)
17. 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.
18. 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.

1. Making upper Alginate impression
2. Making lower Alginate impression
3. Study Model preparation
4. 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 IV YEAR B.D.S.

1. Case History taking
2. Case discussion
3. Discussion on the given topic
4. Cephalometric tracings
 - a. Down's Analysis
 - b. Steiner's Analysis
 - c. Tweed's Analysis

PRACTICAL TRAINING DURING IV 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
 - Upper & Lower Hawley's Appliance
 - Upper Hawley's with Anterior bite plane
 - Upper Habit breaking Appliance
 - Upper Hawley's with Posterior bite plane with 'Z' Spring
 - Construction of Activator
 - Lower inclined plane/Catalan's Appliance
 - Upper Expansion plate with Expansion Screw

D) SCHEME OF EXAMINATION

1. Internal Assessment - i) Theory : 10 Marks
ii) Practical : 10 marks

2. Theory : 70 Marks

Distribution of Topics and Type of Questions:

Type of Questions	No. of Questions and Marks	Marks
Malocclusion Diagnosis & treatment planning Removable Orthodontics Corrective Orthodontics Any other topic	MCQ's 2 X 1 mark 2 X 1 mark 2 X 1 mark 2 X 1 mark 2 X 1 mark	10
Growth and Development Development of dentition and occlusion Diagnostic Aids Etiology and Classification of malocclusion Habits Biology of Tooth movement Anchorage Retention and Relapse Methods of gaining space and extraction in orthodontics Myofunctional Appliances Treatment Planning	Long Essays 2 x 10 marks	20
Questions may be asked from all topics	Short Essays 4x5 marks	20
Questions may be asked from all topics	Short Answers 10x2 marks	20
Total		70

3. Viva Voce : 20 Marks

4. Practicals / Clinicals : 90 Marks

1. Clinical Discussion (on patient study models) 20 marks
2. Spotters – 10 numbers (3 marks each) 30 marks
3. Wire Bending Exercise – 3 Numbers 40 marks

- Clasps
- Springs
- Labial Bows

E) RECOMMENDED AND REFERENCE BOOKS

Textbooks

1. William r. Proffit- Contemporary orthodontics – 5th edition
2. Orthodontic Diagnosis & Management of Malocclusion & Dentofacial Deformities- OP Kharbanda
3. Textbook Of Orthodontics- Sridhar Premkumar,4th Edition

Books of Reference

4. Moyers-Handbook of orthodontics-4th edition
5. Graber- Orthodontics - principles and practice –3rd edition

Practical Books

6. C. Philip Adams -Design, construction and use of removable Orthodontic appliances-6th edition
7. Removable Orthodontic appliances- Isaacson KG

PERIODONTOLOGY

A) GOAL

To provide a basic and advanced education in Periodontics for an improved understanding of Periodontal diseases and increased skill in its management.

B) 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.

C) COURSE CONTENT IN DETAIL

I. Theory : Minimum Teaching Hours: 80 Hours (III BDS - 30 Hrs.; IV BDS-50 Hrs.)

<p>1. Introduction</p> <ul style="list-style-type: none"> • Definition of Periodontology • Periodontics • Periodontia • Brief historical background & Scope of Periodontics 	01Hr
<p>2. Development of perio-dontal tissues</p> <ul style="list-style-type: none"> • Micro-structural anatomy and biology of periodontal tissues in detail • Gingiva • Junctional epithelium in detail • Epithelial-Mesenchymal interaction • Periodontal ligament • Cementum • Alveolar bone 	06 Hrs.
<p>3. Defensive mechanisms in the oral cavity</p> <ul style="list-style-type: none"> • Role of-Epithelium • Gingival fluid 	02 Hrs.

<ul style="list-style-type: none"> • Saliva • Other defensive mechanisms in the oral environment 	
<p>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</p>	01 Hr.
<p>5. Classification of periodontal diseases</p> <ul style="list-style-type: none"> • Need for classification • Scientific basis of classification • Classification of gingival and periodontal diseases as described in World Workshop1999 <p>Gingival disease</p> <ol style="list-style-type: none"> 1. Plaque induced gingival disease 2. Non plaque induced gingival disease <p>Chronic periodontitis</p> <ol style="list-style-type: none"> 1. Localised 2. Generalised <p>Aggressive periodontitis</p> <ol style="list-style-type: none"> 1. Localised 2. Generalised <p>Periodontitis as manifestation of systemic disease</p> <p>Necrotising periodontal disease</p> <ol style="list-style-type: none"> 1. Necrotising ulcerative gingivitis 2. Necrotising ulcerative periodontitis <p>Abscess of the Periodontium</p> <ol style="list-style-type: none"> 1. Gingival 2. Periodontal 3. Pericoronal <p>Periodontitis associated with endodontic lesion</p> <ol style="list-style-type: none"> 1. Endodontic –periodontic lesion 2. Periodontic –endodontic lesion 3. Combined 	01 Hr.

<p>Developmental or acquired deformities and condition</p> <ol style="list-style-type: none"> 1. Localised tooth –related factor that predispose to plaque induced gingival disease or periodontitis 2. Mucogingival deformities and condition around teeth 3. Mucogingival deformities and condition on edentulous ridges 4. Occlusal trauma 	
<p>6. Gingival diseases Localized and generalized gingivitis, Papillary, marginal and diffuse gingivitis Etiology, pathogenesis, clinical signs, symptoms and management of</p> <ul style="list-style-type: none"> • Plaque associated gingivitis • Systemically aggravated gingivitis(sex hormones, drugs and systemic diseases) • ANUG • Desquamative gingivitis-Gingivitis associated with lichen planus, pemphigoid, pemphigus, and other vesiculobullous lesions • Allergic gingivitis • Infective gingivitis-Herpetic, bacterial and candidial • Pericoronitis • Gingival enlargement (classification and differential diagnosis) 	07 Hrs.
<p>7. Epidemiology of periodontal diseases</p> <ul style="list-style-type: none"> • 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 &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) 	01 Hr.
<p>8. Extension of inflammation from gingival</p> <ul style="list-style-type: none"> • Mechanism of spread of inflammation from gingival area to deeper periodontal structures • Factors that modify the spread 	02 Hrs.
<p>9. Pocket</p> <ul style="list-style-type: none"> • Definition 	02 Hr.

<ul style="list-style-type: none"> • Signs and symptoms • Classification • Pathogenesis • Histopathology • Root surface changes • Contents of the pocket 	
<p>10. Etiology</p> <ul style="list-style-type: none"> • 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 • Bacteria associated with periodontal diseases • Plaque retentive factors • Materia alba • Food debris • Calculus <ul style="list-style-type: none"> ○ Definition ○ Types ○ Composition ○ Attachment ○ Theories of formation ○ Role of calculus in disease • Food Impaction <ul style="list-style-type: none"> ○ Definition ○ Types ○ Etiology ○ Hirschfelds' classification ○ Signs, Symptoms & sequelae of treatment • Trauma from occlusion <ul style="list-style-type: none"> ○ Definition 	09 Hrs.

<ul style="list-style-type: none"> ○ Types ○ Histopathological changes ○ Role in periodontal disease ○ Measures of management in brief ● Habits <ul style="list-style-type: none"> ○ Their periodontal significance ○ Bruxism & parafunctional habits ○ Tongue thrusting ○ Lip biting ○ Occupational habits <p>IATROGENIC FACTORS</p> <ul style="list-style-type: none"> ● 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 <ul style="list-style-type: none"> ○ Diabetes ○ Sex hormones, ○ Nutrition(Vit.C&proteins) ○ AIDS & periodontium ○ Hemorrhagic diseases ○ Leukemia ○ Clotting factor disorders ○ PMN disorders 	
<p>11. Risk factors</p> <ul style="list-style-type: none"> ● Definition ● Risk factors for periodontal diseases 	<p>01 Hr.</p>

<p>12. Host response</p> <ul style="list-style-type: none"> • 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 	02 Hrs.
<p>13. Periodontitis</p> <ul style="list-style-type: none"> ○ Etiology ○ Histopathology ○ Clinical signs & symptoms ○ Diagnosis and treatment of adult periodontitis • Periodontal abscess <ul style="list-style-type: none"> ○ Definition ○ Classification ○ Pathogenesis ○ Differential diagnosis and treatment • Furcation involvement <ul style="list-style-type: none"> ○ Glickmans' classification ○ Prognosis and management • Rapidly progressive periodontitis • Juvenile periodontitis <ul style="list-style-type: none"> ○ Localized and generalized ○ Post-juvenile periodontitis • Periodontitis associated with systemic diseases • Refractory periodontitis 	05 Hrs.
<p>14. Diagnosis</p> <ul style="list-style-type: none"> • Routine procedures • Methods of probing • Types of probes (According to case history) • Halitosis: Etiology and treatment • Mention advanced diagnostic aids and their role in brief 	03 Hrs.
<p>15. Prognosis</p> <ul style="list-style-type: none"> • Definition • Types • Purpose and factors to be taken into consideration 	01 Hr.
<p>16. Treatment plan - Factors to be considered</p>	01 Hr.
<p>17. Periodontal therapy</p>	05 Hrs.

<ul style="list-style-type: none"> • General principles of periodontal therapy <ul style="list-style-type: none"> ○ Phase I,II, III, IV therapy ○ Definition of periodontal regeneration repair, new attachment and reattachment. • Plaque control <ul style="list-style-type: none"> ○ Mechanical tooth brushes ,interdental cleaning aids, dentifrices ○ Chemical; classification and mechanism of action of each & pocket irrigation 	
<p>18. Pocket eradication procedures</p> <ul style="list-style-type: none"> • Scaling and root planing: <ul style="list-style-type: none"> • 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 	04 Hrs.
<p>19. Osseous Surgery Osseous defects in periodontal disease</p> <ul style="list-style-type: none"> • Definition • Classification • Surgery: resective, additive osseous surgery (osseous grafts with classification of grafts) • Healing responses • Other regenerative procedures; root conditioning • Guided tissue regeneration 	05 Hrs.
<p>20. Mucogingival surgery & periodontal plastic surgeries</p> <ul style="list-style-type: none"> ○ Definition • Mucogingival problems: etiology, classification of gingival recession (P.D.Miller Jr. and Sullivan and Atkins) <ul style="list-style-type: none"> ○ Indications & objectives • Gingival extension procedures: lateral pedicle graft, frenectomy, frenotomy Crown lengthening procedures 	03 Hrs.

<ul style="list-style-type: none"> • Periodontal microsurgery in brief. 	
21. Splints <ul style="list-style-type: none"> • Periodontal splints • Purpose & classification • Principles of splinting 	01 Hr.
22. Hypersensitivity <ul style="list-style-type: none"> • Causes • Theories & management 	01 Hr.
23. Implants <ul style="list-style-type: none"> • Definition • Types • Scope • Biomaterials used • Periodontal considerations: <ul style="list-style-type: none"> ○ such as implant-bone interface ○ Implant-gingiva interface ○ Implant failure ○ Peri-implantitis ○ Management. 	03 Hrs.
24. Maintenance phase (SPT) <ul style="list-style-type: none"> • Aims, objectives, and principles • Importance • Procedures • Maintenance of implants 	01 Hr.
25. Pharmaco-therapy <ul style="list-style-type: none"> • Periodontal dressings • Antibiotics & anti-inflammatory drugs • Local drug delivery systems 	04 Hrs.
26. Periodontal management of medically compromised patients Topics concerning periodontal management of medically compromised patients	03 Hrs.
27. Inter-disciplinary care <ul style="list-style-type: none"> • Pulpo-periodontal involvement 	01 Hr.

<ul style="list-style-type: none"> • Routes of spread of infection • Simons' classification • Management 	
28. Systemic effects of periodontal diseases in brief <ul style="list-style-type: none"> • Cardiovascular diseases • Low birth weight babies etc. 	01 Hrs.
29. Infection control protocol Sterilization and various aseptic procedures.	01 Hr.
30. Ethics.	01 Hr.
31. Recent advances <ul style="list-style-type: none"> • Microsurgery • Lasers 	01 Hr.

II. Clinicals : 200 Hrs. (III BDS – 70 Hrs.; IV BDS 130 Hrs.)

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 planing 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.

D) SCHEME OF EXAMINATION

1. Internal Assessment – i) Theory : 10 Marks
 ii) Practicals : 10 marks

2. University Examination - Theory: 70 Marks

Distribution of Topics and Type of Questions:

Contents	Type of Questions and Marks	Marks
Normal tissues of Periodontium Etiology of periodontal disease Relationship between periodontal disease and systemic health Periodontal pathology and therapy Implantology others	MCQ's 1 x 1mark 2 x 1 mark 1 x 1 mark 3 x 1 mark 1 x 1 mark 2 x 1 mark	10
Gingiva, Periodontal Ligament, Occlusal and Periodontal Health, Plaque and its management, Calculus, Advanced Diagnostic Aids, Treatment Plan, Prognosis, Trauma from Occlusion, Periodontal Pockets, Acute Infections of Gingiva, Classification of Periodontal Diseases and any one in Detail Diagnosis, Prognosis, Surgical Periodontal Therapy, Gingivoplasty, Gingivectomy, Flap	Long Essays 2 x 10 marks	20

Surgeries, Resective Osseous Surgery, Mucogingival Surgery, Antibiotics and Anti-Inflammatory Drugs		
Cementum, Alveolar Bone, Defence Mechanisms of Gingiva, Classification of Periodontal Disease, Plaque and its Hypothesis, Calculus, Plaque Control, Altered Leucocyte Mechanisms, Anug, Habits, Aids in Periodontium, Mechanism of Spread of Infection, Indices-Gingival and Periodontal, Furcation Involvement, Gingival Recession, Antibiotics in Periodontia, Host Response, Rational of Periodontal Therapy Implants, Maintenance phase (SPT)	Short Essays 4 x 5 marks	20
Questions may be asked from all topics	Short Answers 10 x 2 marks	20
Total		70

3. Viva Voce : **20 Marks**

4. Practicals : **90 Marks**

Clinical case history – 30marks

Clinical work (scaling) – 60marks

E) RECOMMENDED BOOKS

1. Carranza - Glickman's Clinical Periodontology-10th edition & 11th edition
2. TorquilMacPhee & Geoffrey Cowley - Essentials of Periodontology and periodontics- 3rd edition
3. D Walter Cohen, Robert J Genco, Henry M. Goldman - Contemporary periodontics- 1st edition
4. D Walter Cohen, Robert J Genco, Henry M. Goldman - Periodontal therapy- 6th edition
5. Orban - Orban's periodontics-
6. W.H.O.-Oral Health Survey- basic methods-4th edition
7. Young and Stiffler - Preventive Periodontics-

8. Slack - Public Health Dentistry-
9. John Prichard - Advanced Periodontal Disease-
10. Forrest - Preventive Dentistry- 2nd edition
11. Niklaus P. Lang and Jan Lindhe(Lang Lindhe) - Clinical Periodontology & Implant Dentistry – 6th edition
12. Baer & Morris - Periodontics-
13. Jill S. Nield – Fundamentals of Periodontal instrumentation – 6th edition
14. Perry DA, Beemstubrum& Carranza - Techniques & Theory of Periodontal instrumentation – 9th edition
15. DianellSchoel& Mary Catherine Dean – Contemporary Periodontal instrumentation –
16. Shanti Priya Reddy – Essential of clinical Periodontology & Periodontics – 5th edition
17. Colour Atlas of Dental Medicine – Periodontology. Herbert F Wolf, Edith M, Klaus H. Rateitschak, Thomas M. Hassell – 3rd Edition
18. Periodontics – B.M. Eley, M. Soory, J.D. Manson – 6th Edition

ORAL & MAXILLOFACIAL SURGERY

A) GOAL

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.”

B) 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.

C) COURSE CONTENT IN DETAIL

I. Theory : Minimum Teaching Hours: 70 Hrs.
20 Hrs.; IV BDS-50 Hrs.)

(III BDS-

<p>1. Introduction</p> <p>Definition, scope, aims and objectives.</p>	<p>01 Hr.</p>
<p>2. Diagnosis in oral surgery</p> <ul style="list-style-type: none"> • History taking • Clinical examination and Investigations. 	
<p>3. Principles of infection control and cross-infection control with particular reference to HIV/AIDS and Hepatitis.</p>	<p>01 Hr.</p>
<p>4. Principles of Oral Surgery</p> <ul style="list-style-type: none"> • Asepsis: Definition, measures to prevent introduction of infection during surgery. <ol style="list-style-type: none"> 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. • Painless Surgery: <ol style="list-style-type: none"> 1. Pre- anaesthetic considerations Pre-medication: purpose, drugs used 2. Anaesthetic considerations - <ul style="list-style-type: none"> • Local • Local with IV sedations 3. Use of general anaesthetic • Access: <p>Intra-oral: Mucoperiosteal flaps, principles, commonly used intra oral incisions.</p> 	<p>05 Hrs.</p>

<p>Bone Removal: Methods of bone removal.</p> <p>Use of Burs: Advantages & precautions</p> <p>Bone cutting instruments: Principles of using chisel & osteotome.</p> <p>Extra-oral: Skin incisions - principles, various extra-oral incision to expose facial skeleton.</p> <ul style="list-style-type: none"> • Submandibular • Pre auricular • Incision to expose maxilla & orbit <p>Bicoronal incision</p> <ul style="list-style-type: none"> • Control of haemorrhage during surgery <ul style="list-style-type: none"> Normal Haemostasis Local measures available to control bleeding Hypotensive anaesthesia etc. • Drainage & Debridement <ul style="list-style-type: none"> Purpose of drainage in surgical wounds Types of drains used Debridement: purpose, soft tissue & bone debridement. • Closure of wounds <ul style="list-style-type: none"> Suturing: Principles, suture material, classification, body response to various materials etc. • Post operative care <ul style="list-style-type: none"> 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. 	
<p>5. Exodontia:</p> <ul style="list-style-type: none"> • General considerations • Ideal Extraction. • Indications for extraction of teeth • Extractions in medically compromised patients. • Methods of extraction – <ul style="list-style-type: none"> a) Forceps or intra-alveolar or closed method. <ul style="list-style-type: none"> Principles, types of movement, force etc. b) Trans-alveolar, surgical or open method <ul style="list-style-type: none"> Indications, surgical procedure. • Dental elevators: uses, classification, principles in the use of elevators, commonly used elevators. • Complications of Exodontia <ul style="list-style-type: none"> Complications during exodontias Common to both maxilla and mandible. Post-operative complications Prevention and management of complications. 	<p>06 Hrs.</p>

<p>6. Impacted teeth:</p> <ul style="list-style-type: none"> • Incidence, definition, aetiology. • Impacted mandibular third molar. Classification, reasons for removal, Assessment - both clinical & radiological Surgical procedures for removal. Complications during and after removal, Prevention and management. • Maxillary third molar, Indications for removal, classification, Surgical procedure for removal. • Impacted maxillary canine Reasons for canine impaction, Localization, indications for removal, Methods of management, labial and palatal approach, Surgical exposure, transplantation, removal etc. 	03 Hrs.
<p>7. Pre-prosthetic Surgery:</p> <p>Definition, classification of procedures</p> <ul style="list-style-type: none"> • Corrective procedures: Alveoloplasty, Reduction of maxillary tuberosities, Frenectomies and removal of tori. • Ridge extension or Sulcus extension procedures Indications and various surgical procedures • 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. 	03 Hrs.
<p>8. Diseases of the maxillary sinus</p> <ul style="list-style-type: none"> • Surgical anatomy of the sinus. • Sinusitis both acute and chronic • Surgical approach of sinus - Caldwell-Luc procedure • Removal of root from the sinus. 	02 Hrs.

<ul style="list-style-type: none"> Oro-antral fistula - aetiology, clinical features and various surgical methods for closure. 	
<p>9. Disorders of T.M. Joint</p> <ul style="list-style-type: none"> 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. 	03 Hrs.
<p>10. Infections of the Oral cavity</p> <ul style="list-style-type: none"> 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. 	04 Hrs.
<p>11. Benign cystic lesions of the jaws</p> <ul style="list-style-type: none"> 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. 	03 Hrs.
<p>12. Tumours of the Oral cavity</p> <ul style="list-style-type: none"> General considerations Non odontogenetic benign tumours occurring in oral cavity - fibroma, papilloma, lipoma, ossifying fibroma, mynoma etc. Ameloblastoma - Clinical features, radiological appearance and methods of management. Carcinoma of the oral cavity - <ul style="list-style-type: none"> Biopsy - types TNM classification. Outline of management of squamous Cell carcinoma: surgery, radiation and chemotherapy 	06 Hrs.

<ul style="list-style-type: none"> • Role of dental surgeons in the prevention and early detection of oral cancer. 	
<p>13. Fractures of the jaws</p> <ul style="list-style-type: none"> • 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. 	08 Hrs.
<p>14. Salivary gland diseases</p> <ul style="list-style-type: none"> • 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. 	03 Hrs.
<p>15. Jaw deformities</p> <ul style="list-style-type: none"> • Basic forms - Prognathism, Retrognathism and open bite. • Reasons for correction. • Outline of surgical methods carried out on mandible and maxilla. 	03 Hrs.
<p>16. Neurological Disorders</p> <ul style="list-style-type: none"> • Trigeminal neuralgia - definition, aetiology, clinical features and methods of management including surgical. • Facial paralysis - Aetiology, clinical features. • Nerve injuries - Classification, neurohaphy etc. 	03 Hrs.

<p>17. Cleft Lip and Palate</p> <ul style="list-style-type: none"> • Aetiology of the clefts, incidence, classification, role of dental surgeon in the management of cleft patients. • Outline of the closure procedures. 	02 Hrs.
<p>18. Medical Emergencies in dental practice</p> <p>Primary care of medical emergencies in dental practice particularly -</p> <ol style="list-style-type: none"> a) Cardio vascular b) Respiratory c) Endocrine d) Anaphylactic reaction e) Epilepsy 	01 Hr.
<p>19. Emergency drugs & Intra muscular I.V. Injections</p> <p>Applied anatomy, Ideal location for giving these injections, techniques etc.</p>	01 Hr.
<p>20. Oral Implantology</p>	01 Hr.
<p>21. Ethics</p>	01 Hr.

LOCAL ANAESTHESIA:

<p>1. • Introduction, concept of L.A., classification of local anaesthetic agents, ideal requirements, mode of action, types of local anaesthesia, complications.</p> <ul style="list-style-type: none"> • 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. 	06 Hrs.
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GENERAL ANAESTHESIA

<p>1.</p> <ul style="list-style-type: none"> • 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 Medozolam. • Indications, mode of action, technique etc. • Cardiopulmonary resuscitation • Use of oxygen and emergency drugs. • Tracheostomy. 	03 Hrs.
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II. Clinicals : 270 Hrs.**D) SCHEME OF EXAMINATION**

1. Internal Assessment - Theory : 10 Marks Practicals : 10 marks

2. University Examination - Theory : 70 Marks

Distribution of Topics and Type of Questions:

Contents	Type of Questions and Marks	Marks
Exodontia Impacted teeth Infections of oral cavity Benign cystic lesion of jaws Tumours of oral cavity Fractures of the jaws Medical emergencies Local anaesthesia	MCQ's 2 X 1 mark 1 X 1 mark 1 X 1 mark 1 X 1 mark 1 X 1 mark 2 X 1 mark 1 X 1 mark 1 X 1 mark	10 marks
Local Anaesthesia Oral Surgery	Long Essays 1 x 10 marks 1 x 10 marks	20

Oral Surgery General Anaesthesia	Short Essays 3 x 5 marks 1 x 5 marks	20
Oral Surgery Local Anaesthesia	Short Answers 9 x 2 marks 1 x 2 marks	20
Total		70

3. Viva Voce : **20 Marks**

4. Practicals : **90 Marks**

1. Case history, examination of the patient, presenting the case history to the examiners at the chair side. - Marks 30
- Local Anaesthesia technique - Marks 20
2. Extraction of firm molar, (either maxillary/mandibular) tooth and management of patient - Marks 40

E) RECOMMENDED BOOKS

1. J.M.Korbendau – Impacted 3rd Molar Extraction – 1st edition
2. Peterson LJ & etal - Principles of oral and maxillofacial surgery- Vol.1,2 & 3 - 2nd edition
3. Srinivasan B- Text book of oral and maxillofacial surgery- 2nd edition
4. Malamed SF- Handbook of medical emergencies in the dental office - 6th edition
5. Banks P - Killeys Fractures of the mandible – 4th edition
6. Banks P - Killeys fractures of the middle 3rd of the facial skeleton- 5th edition
7. Jensen - The Sinus bone graft – 2nd edition
8. Seward GR & etal - Killey and Kays outline of oral surgery – Part-1 - 2nd edition
9. Laskin DM - Oral & maxillofacial surgery, Vol 1 & 2 – reprint 02
10. Howe, GL - Extraction of teeth- 2nd edition
11. Howe.GL - Minor Oral Surgery- 3rd edition
12. Peterson I.J.& EA- Contemporary oral and maxillofacial surgery- 4th edition
13. Topazian RG & Goldberg MH - Oral and maxillofacial infections – 4th edition
14. Shears - Cysts of the jaws – 4th edition
15. Rowe and Williams-Fractures of Jaws, Vol 1 & 2 – 2nd edition
16. Neelima Malik- Text book of oral and Maxillofacial Surgery – 2nd edition

CONSERVATIVE DENTISTRY AND ENDODONTICS

A) GOAL

B) OBJECTIVES

a) KNOWLEDGE AND UNDERSTANDING

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. Diagnosis of luxation of tooth and its treatment and to provide emergency endodontic treatment.

b) 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. Processes 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.

c) ATTITUDES

1. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
2. Willingness to participate in CDE programmes 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 at the same time proper maintenance of oral hygiene should be emphasised which will help to maintain the restorative work and prevent future damage.

C) COURSE CONTENT IN DETAIL

**I.Theory : Minimum Teaching Hours: 135 Hrs.
Hrs.;IV BDS-80 Hrs.)**

(II-BDS 25 Hrs. ;III-BDS 30

<p>Introduction :</p> <ul style="list-style-type: none"> • Definition, aims, objectives of Conservative Dentistry ,scope and future of Conservative Dentistry. <p>01. Nomenclature Of Dentition:</p> <ul style="list-style-type: none"> • Tooth numbering systems <ul style="list-style-type: none"> ○ A.D.A. ○ Zsigmondy/Palmer ○ F.D.I. systems 	02 Hrs.
<p>02. Principles Of Cavity Preparation</p> <ul style="list-style-type: none"> • Steps and nomenclature of cavity preparation • Classification of cavities • Nomenclature of floors,wall and angles of cavities 	03 Hrs.
<p>03. Dental Caries:</p> <ul style="list-style-type: none"> • Aetiology • Classification • clinical features • morphological features • microscopic features • clinical diagnosis and • Sequel of dental caries 	03 Hrs.
<p>04. Treatment Planning For Operative Dentistry:</p> <ul style="list-style-type: none"> • Detailed clinical examination • Radiographic examination • Tooth vitality tests • Diagnosis and treatment planning • Preparation of the case sheet 	03 Hrs.
<p>05. Gnathological Concepts Of Restoration:</p> <ul style="list-style-type: none"> • Physiology of occlusion, • normal occlusion, • Ideal occlusion, • mandibular movements and occlusal analysis. • Occlusal rehabilitation and restoration 	01Hr.
<p>06. Armamentarium For Cavity Preparation:</p> <ul style="list-style-type: none"> • General classification of operative instruments, • Hand cutting instruments- design,formula and sharpening of instruments. • Rotary cutting instruments -dental bur, design ,mechanism of cutting, evaluation of hand piece and speed, current concepts 	05 Hrs.

<ul style="list-style-type: none"> of rotary cutting procedures. • Sterilisation and maintenance of instruments. • Basic instrument tray set up 	
<p>07. Control Of Operating Field:</p> <ul style="list-style-type: none"> • Light source • Sterilisation field of operation • Control of moisture <ul style="list-style-type: none"> ○ rubber dam in detail ○ cotton rolls ○ evacuation devices and ○ anti sialogogues 	02 Hrs.
<p>08. Amalgam Restoration</p> <ul style="list-style-type: none"> • Indications& contraindications • 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 	07 Hrs.
<p>09. Pulp Protection :</p> <ul style="list-style-type: none"> • Liners, varnishes and bases <ul style="list-style-type: none"> ○ Zinc phosphate ○ zinc polycarboxylate ○ zinc oxide eugenol and ○ glass inomer cements 	03 Hrs.
<p>10. Anterior Restorations :</p> <ul style="list-style-type: none"> • Selection of cases, • Selection of material, • Step wise procedures for using restorations , • Silicate (theory only) • Glass ionomers, • Composite resin including sandwich restorations and bevels of the same with a note on status of the dentin bonding agents • Ceramics 	05 Hrs.
<p>11. Direct Filling Gold Restorations</p> <ul style="list-style-type: none"> • Types of direct filling gold • Indications and limitations of direct filling gold • Annealing of gold foil • Cavity preparation and • Manipulation of direct filling gold 	02 Hrs.

12. Preventive Measures In Restorative Practice <ul style="list-style-type: none"> • Plaque Control • Caries control • Pit and fissure sealants • Dietary measures ,restorative procedure and periodontal health. • Contact and contour of teeth and restorations • Matrices, tooth separation and wedges. 	05 Hrs.
13. Temporisation Or Interim Restoration	01 Hr.
14. Pin Amalgam Restoration <ul style="list-style-type: none"> • Indications, Contraindications, Advantages and disadvantages of each • Types of pins,and methods of placement • Use of auto matrix • Failure of pin amalgam restoration 	02 Hrs.
15. Management Of Deep Carious Lesions <ul style="list-style-type: none"> • Indirect And Direct Pulp Capping • Pulpotomy 	02 Hrs.
16. Non Carious Destruction of Tooth Structures <ul style="list-style-type: none"> • Diagnosis And Clinical Management 	2 Hrs.
17. Hyper sensitive Dentin And Its Management.	02 Hrs.
18. Cast Restorations: <ul style="list-style-type: none"> • Indications, contraindications, advantages and disadvantages and materials used for same • Class II and Class I cavity preparation for gold inlays • Fabrication of wax pattern ,sprueing ,investing and casting procedures & casting defects 	05 Hrs.
19. Die Materials And Preparation Of Dies	01 Hr.
20. Gingival Tissue Management For Cast Restoration And Impression Procedures	01 Hr.
21. Recent Cavity Modification for Amalgam Restoration	02 Hrs.
22. Differences Between Amalgam and gold Inlay Cavity Preparation with note on all the types of bevels used for Cast Restoration	02 Hrs.

23. Control Of Pain During Operative Procedures	01 Hr.
24. Treatment Planning For Operative Dentistry <ul style="list-style-type: none"> • Detailed Clinical Examination • Radiographic Examination 	02 Hrs.
25. Vitality Tests <ul style="list-style-type: none"> • Diagnosis And Treatment Planning And • Preparation of Case Sheet 	02 Hrs.
26 Applied Dental Materials. <ol style="list-style-type: none"> 1. Biological Considerations. Evaluation, clinical application and adverse effects of the following materials. Dental cements, Zinc oxide eugenolcements ,zinc phosphate cements, polycarboxylates, glass ionomer cements, silicate cement, calcium hydroxides and cavity varnishes. 2. Dental amalgam, technical considerations, mercury toxicity and mercury hygiene. 3. Composite resin, Dentin bonding agents, chemical and light curing composites 4. Rubber base Impression. Materials 5. Noble metal alloys & base metal alloys 6. Investment and die materials 7. Inlay casting waxes 8. Dental porcelain 9. Aesthetic Dentistry 	20 Hrs.
27. Endodontics: Introduction <ul style="list-style-type: none"> • Definition • Scope and • Future of endodontics 	01 Hr.
28. Clinical diagnostic methods	02 Hrs.
29. Emergency endodontic procedures	
30. Pulpal diseases <ul style="list-style-type: none"> • Causes • Types and • Treatment 	02 Hrs.

31. Periapical diseases: <ul style="list-style-type: none"> • Acute periapical abscess, • Acute periodontal abscess • Phoenix abscess • Chronic alveolar abscess • Granuloma • Cysts • Condensing osteitis, • External resorption 	03 Hrs.
32. Vital pulp therapy: <ul style="list-style-type: none"> • Indirect and direct pulp capping • Pulpotomy <ul style="list-style-type: none"> ○ Different types and ○ Medicaments used 	02 Hrs.
33. Apexogenesis and apexification or problems of open apex	01 Hr.
34. Rationale of endodontic treatment <ul style="list-style-type: none"> • Case selection • Indications and contraindications for root canal treatment 	01Hr.
35. Principles of root canal treatment <ul style="list-style-type: none"> • Mouth preparation • Root canal instruments • Hand instruments • Power driven instruments • Standardisation • Color coding • Principles of using endodontic instruments • Sterilisation of root canal instruments and materials • Rubber dam application 	04 Hrs.
36. Anatomy of the pulp cavity ,pulpchamber,root canals and apical foramen. <ul style="list-style-type: none"> • Anomalies of pulp cavities • access cavity preparation of anterior and premolar teeth 	02 Hrs.
37. Preparation of root canal space <ul style="list-style-type: none"> • Determination of working length • Cleaning and shaping of root canals • Irrigating solution • Chemical aids to instrumentation 	03 Hrs.
38. Disinfection of root canal space	03 Hrs.

<ul style="list-style-type: none"> • Intracanal medicaments • Poly antibiotic paste • Grossman's paste • Mummifying agents • Outline of root canal treatment • Bacteriological examinations • Culture methods 	
39. Problems during cleaning and shaping of root canal spaces <ul style="list-style-type: none"> • Perforation and its management. • Broken instruments and its management, • management of single and double curved root canals 	03 Hrs.
40. Methods of cleaning and shaping <ul style="list-style-type: none"> • Step back • Crown down and • Conventional method 	02 Hrs.
41. Obturation of the root canal system. <ul style="list-style-type: none"> • Requirements of an ideal root canal filling material • Obturation methods using guttapercha • Healing after endodontic treatment • Failures in endodontics 	03 Hrs.
42. Root canal sealers <ul style="list-style-type: none"> • Ideal properties • Classification • Manipulation of root canal sealers 	01 Hr.
43. Post endodontic restoration fabrication and components of post and core preparation	02 Hrs.
44. Smear layer and its importance in conservative and endodontic treatment	01 Hr.
45. Discoloured teeth and its management <ul style="list-style-type: none"> • Bleaching agents • vital and non vital bleaching methods 	02 Hrs.
46. Traumatized teeth <ul style="list-style-type: none"> • Classification of fractured teeth • Management of fractured teeth and root • Luxated teeth and its management 	03 Hrs.
47. Endodontic surgeries	03 Hrs.

<ul style="list-style-type: none"> • Indications • Contraindications • Pre operative preparation • Pre medication • Surgical instruments and techniques • Apicectomy • Root end filling • Post operative sequelae • Trephination • Hemisection • Radisectomy • Techniques of tooth replantation (both extraction and avulsion) • Endodontic implants 	
48. Root resorption	01 Hr.
49. Emergency endodontic procedures	01 Hr.
50. Lasers in conservative endodontics (introduction only) practice management	01 Hr.
51. Professional association, Dentist act 1948, and its amendment 1993	01 Hr.
52. Duties towards the govt. Like payments of professional tax, income tax	01 Hr.
53. Financial management of practice	01 Hr.
54. Dental material and basic equipment management	01 Hr.
55. Ethics	01 Hr.

D) SCHEME OF EXAMINATION**1. Internal Assessment – i) Theory : 10 Marks****ii) Practical : 10 marks****2. Theory : 70 Marks****Distribution of Topics and Type of Questions:**

Contents	Type of Questions and Marks	Marks
Conservative dentistry Endodontics	MCQ's 5 x 1 mark 5 x 1 mark	10
Conservative dentistry Endodontics	Long Essays 1 x 10 marks 1 x 10 marks	20
Conservative dentistry Endodontic	Short Essays 2 x 5 marks 2 x 5 marks	20
Conservative dentistry Endodontic	Short Essays 5 x 2 marks 5 x 2 marks	20
Total		70

3. Viva Voce : 20 Marks**4. Practical : 90 Marks**

1. Preparation of Class II Cavity for Amalgam in a posterior tooth pulp protection, matrix application and restoration.

OR

2. Case history, examination, preparation of Access Cavity for Root Canal Treatment in an Anterior Tooth followed by working length determination, biomechanical preparation and up to the selection of the Master cone.

Details of Marks Distribution of the Practical Examination: -

1. Conservative Exercise:	
Class II Cavity Preparation	50 Marks
Base and matrix	15 Marks
Restoration and Carving	25 marks
Total	90 Marks

OR

2. Endodontic Exercise:	
Case History and examination	10 Marks
Access Cavity	15 Marks
Working Length Determination	25 Marks
Bio-Mechanical Preparation and	30 Marks
Master cone selection	10 Marks
Total	90 Marks

E) RECOMMENDED BOOKS

1. Clifford .M.Sturdevant-The art and science of Operative Dentistry-5thedition.
2. G.T. Charbeneau-Principles and practice of operative dentistry-3rd edition
3. Luis.I.Grossman-Endodontic practice-11th edition.
4. John. I. Ingle-Endodontics-6th edition
5. Stephen Cohen-Pathways of pulp-9thedition.

PROSTHODONTICS AND CROWN AND BRIDGE

A) GOAL

1. The goal of Prosthodontics program is to provide basic and advanced education for an improved understanding of prosthetic rehabilitation and restoration of tooth structures.
2. To increase cognitive skills in management of geriatric and general patients.
3. To transform the nature of dental education in ways that will dramatically improve the way

We serve our students, our patient and the surrounding community.

Students will be familiarized with the scientific background for Prosthodontics, including contributions from the published prosthodontic literature.

B) OBJECTIVES

a) KNOWLEDGE & UNDERSTANDING

The student should have a deep knowledge and understanding of the normal functioning of the masticatory system and the dental occlusion, and of dysfunctions of the system relevant to adult restorative dentistry in general and Prosthodontics in particular.

Students will be trained, guided and supervised to perform the design of the prosthesis to the highest level of competency, the full range of laboratory and part of clinical procedures, which are considered essential to establish a practice in Prosthodontics.

The program devotes a considerable portion of time to advanced basic science courses specially organized to serve as a prerequisite to the thorough understanding of the clinical problem in prosthetic rehabilitation in the clinical area.

b) SKILLS

1. The curriculum has been designed to enable the student to attain skills representative of a clinician proficient in the theoretical and practical aspects of the clinical Prosthodontics. The current program is designed to provide knowledge and skills, pertaining to the restoration and maintenance of oral function, comfort, appearance and health of the patient by the restoration of natural teeth and or replacement of missing teeth and craniofacial tissue with artificial substitutes to a standard of performance established for the practice of Prosthodontics.

2. A thorough understanding of disposal of prosthodontic waste should be highlighted to students during their clinical postings and appropriate sterilization and disinfection protocol to be followed.

C) COURSE CONTENT IN DETAIL

I. Theory Minimum Teaching Hours: 135 Hrs. (II BDS – 25 Hrs; III BDS-30 Hrs.; IVBDS-80 Hrs.)

COMPLETE DENTURES (COURSE CONTENT IN PRECLINICAL PROSTHODONTICS)

REMOVABLE PARTIAL DENTURES

1. Introduction • Terminologies and scope	01 Hr.
2. Classification	01 Hr.
3. Examination, diagnosis and treatment planning and evaluation for diagnostic data	02 Hrs.
4. Components of removable partial denture • Major connectors • Minor connectors • Rest and rest seat	04 Hrs.
5. Components of removable partial denture • Direct retainers • Indirect retainers • Tooth replacement	03 Hrs.
6. Principles of removable partial denture Design	01 Hr.
7. Survey and design- in brief • Surveyors • Surveying • Designing	02 Hrs.
8. Mouth preparation and master cast	01 Hr.

9. Impression materials and procedures for removable partial denture	03 Hrs.
10. Preliminary jaw relation and aesthetic try-in for some anterior replacement teeth	01 Hr.
11. Laboratory procedures for framework construction in brief	02 Hrs.
12. Fitting the framework in brief	01 Hr.
13. Try-in of the partial denture in brief	01 Hr.
14. Completion of the partial denture in brief.	01 Hr.
15. Insertion of the removable partial denture in brief.	01 Hr.
16. Post insertion observations	01 Hr.
17. Temporary Acrylic partial dentures	01 Hr.
18. Immediate removable partial denture	01 Hr.
19. Removable partial denture opposing complete denture	01 Hr.
20. Flexible Dentures	01 Hr.
21. Stress breakers & Precision attachments	02 Hrs.

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 and disadvantages
7. Indications and contraindications
8. Maintenance phase

FIXED PARTIAL DENTURES

1.	Introduction	01 Hr.
2.	Fundamentals of occlusion-in brief	01 Hr.
3.	Articulators-in brief	01 Hr.
4.	Treatment planning for single tooth restorations	01 Hr.
5.	Treatment planning for the replacement of missing teeth including selection and choice of abutment teeth	03 Hrs.
6.	Fixed partial denture configurations	02 Hrs.
7.	Principles of tooth preparations	03 Hrs.
8.	Preparations for full veneer crowns-in detail	01 Hr.
9.	Preparations for partial veneer crowns –in brief	01 Hr.
10.	Provisional restorations	01 Hr.
11.	Fluid control and soft tissue management	01 Hr.
12.	Impressions	01 Hr.
13.	Working casts and dies	02 Hrs.
14.	Wax patterns	01 Hr.
15.	Pontics and edentulous Ridges	01 Hr.
16.	Aesthetics consideration	01 Hr.
17.	Finishing and cementation	01 Hr.
18.	Topics to be covered in brief <ul style="list-style-type: none"> • Solder joints and other connectors • All ceramic restorations • Metal ceramic restorations • Preparations of intracoronal restorations • Preparations for extensively damaged teeth • Preparations for periodontally weakened teeth • The functionally generated path • Investing and casting • Resin bonded Fixed Partial Denture 	09 Hrs.

Note- It is suggested that the above mentioned topics be dealtwith 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 and disadvantages
7. Indications and contraindications
8. Maintenance phase

<p>1. Maxillofacial Prosthodontics(integrated approach)</p> <ul style="list-style-type: none"> • Introduction • Obturators • Extra-oral prosthesis 	03 Hrs.
<p>2. Implantology(integrated approach)</p> <ul style="list-style-type: none"> • Introduction • Osseointegration • Impressions • Prosthetic considerations • Maintenance 	05 Hrs.
<p>3. Aesthetic Dentistry(integrated approach)</p> <ul style="list-style-type: none"> • Introduction and scope of aesthetic dentistry • Anatomy & physiology of smile • Role of the colour in aesthetic dentistry • Simple procedures rounding of central incisors to enhance esthetic appearance • Bleaching of teeth • Veneers with various materials • Ceramics 	07 Hrs.

Note- Maxillofacial Prosthodontics, Implantology and Aesthetic Dentistry can be considered for Integrated approach

D) SCHEME OF EXAMINATION

1. Internal Assessment - Theory : 10 Marks Practicals : 10 marks

2. University Examination - Theory: 70 Marks

Distribution of Topics and Type of Questions:

Contents	Type of Questions and Marks	Marks
Complete denture 3 X1 Removable partial denture 3 X1 Fixed partial denture 2 X1 Implantology 1 X1 Maxillofacial Prosthodontics 1X1	MCQ's 3 X1 mark 3 x 1 mark 2 x 1 mark 1 x 1 mark 1 x 1 mark	10
Complete Denture Removable partial Denture / Fixed Partial Denture	Long Essays 1 x 10 marks 1 x 10 marks	20
Complete Denture Removable Partial Denture Fixed Partial Denture	Short Essays 4x5 marks	20
Complete Denture, Removable partial Denture Fixed Partial Denture Implantology Maxillofacial prosthodontics	Short Answers 10x2 marks	20
Total		70

3. Viva Voce : 20 Marks

4. Clinicals : 90 Marks

Exercise No 1: : 80 Marks

Final impression for an edentulous patient – Maxillary or Mandibular

1. Peripheral Moulding – 40 Marks
2. Impression – 40Marks

Exercise No 2 : 10 Marks

Designing on the Master cast for a RPD frame work.

E) RECOMMENDED BOOKS

1. Sheldon Winkler - Essentials of complete denture prosthodontics – 3rd edition
2. Hickey J.C., Zarb G.A., Bolender C.L. - Boucher's "Prosthodontic treatment for edentulous patients" – 13th edition
3. Charles M. Heartwell Jr. and Arthur O. Rahn. - Syllabus of Complete denture - 5th edition
4. Alan B Carr, GlenPMcGivney, DavidTBrown. McCracken's Removable partial prosthodontics - 13th edition
5. Mc. Gregor, Fenn, HR.B, Liddelow, K.P., Clinical dental prosthetics - 3rd edition
6. Ernest L. Miller and Joseph E. Grasso. - Removable partial prosthodontics – 2nd edition
7. Herber T Shillingberg-Fundamentals of fixed partial dentures-4th edition
8. Stephen F Rosenstein-Contemporary Fixed Prosthodontics-4th edition
9. Malone,D.LKoth-Tylman's Theory and practice of Fixed Prosthodontics-8th edition
10. Rodney D.Phoenix,David R Cagna,Charles F Defreet-Stewart's Clinical Removable partial prosthodontics-4th edition

PUBLIC HEALTH DENTISTRY

A) GOAL

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

B) OBJECTIVES

a) KNOWLEDGE & UNDERSTANDING

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 health policy with emphasis on oral health policy.

b) SKILL AND ATTITUDE

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

c) COMMUNICATION ABILITIES

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

C) COURSE CONTENT IN DETAIL

I. Theory : Minimum Teaching Hours: 60 hrs.

<p>1. Introduction to Dentistry</p> <ul style="list-style-type: none"> • Definition of Dentistry, • History of dentistry, • Scope, aims and objectives of Dentistry. 	01 Hr.
<p>2. Public Health</p> <ul style="list-style-type: none"> • Health & Disease: - Concepts, Philosophy, Definition and Characteristics 	35 Hrs.

<ul style="list-style-type: none"> • Public Health: - Definition & Concepts, History of public health • General Epidemiology: - Definition, objectives, methods • Environmental Health: - Concepts, principles, protection, sources, purification environmental sanitation of water disposal of waste sanitation, then role in mass disorder • Health Education: - Definition, concepts, principles, methods, and health education aids • Public Health Administration: - Priority, establishment, manpower, private practice management, hospital management. • Ethics and Jurisprudence: Professional liabilities, negligence, malpractice, consents, evidence, contracts, and methods of identification in forensic dentistry. • Nutrition in oral diseases • Behavioral science: Definition of sociology, anthropology and psychology and their in dental practice and community. • Health care delivery system: Center and state, oral health policy, primary health care, national programmes, health organizations. 	
<p>3. Dental Public Health</p> <ul style="list-style-type: none"> • Definition and difference between community and clinical health. • Epidemiology of dental diseases-dental caries, periodontal diseases, malocclusion, dental fluorosis and oral cancer. • Survey procedures: Planning, implementation and evaluation, WHO oral health survey methods 1997, indices for dental diseases. • Delivery of dental care: Dental auxiliaries, operational and no operational, incremental and comprehensive health care, school dental health. • Payments of dental care: Methods of payments and dental insurance, government plans • Preventive Dentistry- definition, Levels, role of individual, community and profession, fluorides in dentistry, plaque control programmes. 	<p>25 Hrs.</p>
<p>4. Research Methodology and Dental Statistics</p> <ul style="list-style-type: none"> • Health Information: - Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes • Research Methodology: -Definition, types of research, designing a written protocol • 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. 	<p>05 Hrs.</p>

<p>5. Practice Management</p> <ul style="list-style-type: none"> • Place and locality • Premises & layout • Selection of equipments • Maintenance of records/accounts/audit. 	01 Hr.
<p>6. Dentist Act 1948 with amendment.</p> <ul style="list-style-type: none"> • Dental Council of India and State Dental Councils Composition and responsibilities. 	02 Hrs.
<p>7. Indian Dental Association Head Office, State, local and branches.</p>	

II. PRACTICALS / CLINICALS / FIELD PROGRAMME : 200 Hrs.

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

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

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

COMPREHENSIVE ORAL HEALTH CARE PROGRAMME IN COMMUNITY DENTISTRY:

1. 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 students in their approach to diagnosis, treatment planning, cost of treatment, prevention and treatment on schedule, recall maintenance of records etc. at least 10 patients (both children and adults of all types)
- b) The practice of chair side preventive dentistry including oral health education.

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

- 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.(NSS programmes)

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

<p>Payment Plan for Dental Care.</p> <p>Define, Levels of Prevention, Specific preventive measures against Oral Diseases</p> <p>Community water fluoridation.</p> <p>Definition of Community, structure and importance of Social sciences related to Oral Health, Difference between Urban and rural community, role of social scientists in development of Dental Public Health program</p> <p>Planning of setting up of Dental practice.</p> <p>Prevention of Dental Caries – Topical Fluoride application, Vaccines, prevention of plaque, prevention of periodontal disease; Oral cancer, Milk and salt fluoridation, School water fluoridation.</p> <p>Toxicity of fluorides; Different studies on water fluoridation – Newburgh Kingston Studies; 21 Cities Studies.</p>		
<p>Dentist’s Act 1948; Dental Council of India; Ethics for the Dental Profession</p> <p>State Dental Council, Dentist Act 1948, Indian Dental Association.</p> <p>Mean and Standard Deviation; Normal Curve; Sampling Methods.</p> <p>National Health Programs;Philosophy of Public Health.</p> <p>Principles of Epidmiology; Epidemiological Triad; Uses of Epidemiology</p> <p>Barriers for Health Education; Mass Media; Principles of Health Education.</p> <p>Difference between Clinical Dentists and Public Health Dentists; procedures and steps used in Dental Public Health;</p>	<p>Short Essays 4 x 5 marks</p>	<p>20</p>

<p>Functions of Public Health Professional.</p> <p>Path Finder Survey; Indices.</p> <p>Dentists Population Ratio; Dental Auxiliaries.</p> <p>Incremental Dental Care; School based prevention program; Payment plans for dental care.</p> <p>Prevention of Dental Caries – Topical Fluoride application, Vaccines, prevention of plaque, prevention of periodontal disease; Oral cancer, Milk and salt fluoridation, School water fluoridation.</p> <p>Taboos related to Oral Health. Concepts of Oral Health among different socio-economic strata.</p> <p>Setting of fees in dental practice. Quality care, Legal implication, contract. Success in dental practice.</p> <p>Fluoride tablets; Fluoride varnishes; Fluorides in restorative materials; Topical fluoride application; Salt fluoridation; Milk fluoridation; Plaque preventive measures; Pyrophosphates; Mouth washes;</p>		
<p>State Dental Council. Functions of Dental Council of India.</p> <p>Mean, Median, Mode. Different sampling council methods.</p> <p>Prospective Studies, Retrospective Studies, Cohort Study.</p> <p>Mass Media in Health Education. Aims of Survey, Indices. Different Dental Auxiliaries – School Dental Nurse; Expanded function Dental Auxiliary etc.</p> <p>Askov Dental program, Tattle tooth program etc.</p>	<p>Short Answers 10 x 2 marks</p>	<p>20</p>

Prepayment plan; Delta Dental Plan; Co-insurance Toxicity of fluorides; Different studies on water fluoridation – Newburgh Kingston Studies; 21 Cities Studies. Fluoride tablets; Fluoride varnishes; Fluorides in restorative materials; Topical fluoride application; Salt fluoridation; Milk fluoridation; Plaque preventive measures; Pyrophosphates; Mouth washes; Culture Quality required for success in Dental Practice Floor plan for the Dental Clinic; Group practice; Dental Records; Contract.		
Total		70

3. Viva Voce : 20 Marks

4. Practicals : 90 Marks

Examination Pattern

I. Index

Case History & any two following indices : 45 Marks

- a) Oral hygiene indices simplified- Green and Vermilion
- b) Silness and Loe index for Plaque
- c) Loe and Silness index for gingival
- d) CPI;CPITN
- e) DMF: T and S, df:t and s
- f) Deans fluoride index

II. Health Education : 25 Marks

- 1. Make one - Audio visual aid
- 2. Make a health talk

III. Practical work : 20 Marks

- 1. Pit and fissure sealant
- 2. Topical fluoride application

E) RECOMMENDED BOOKS

1. Stephen A Eklund and Brain A. Burt - Dentistry Dental Practice and Community – 6th edition
2. James Morse Dunning - Principles of Dental Public Health – 4th edition
3. George M Glue & Warren M Morganstein – Jong's Community Dental Health - 5th edition
4. Patricia P. Cormier and Joyce I. Levy published by Appleton-Century-Crofts/ New York. Community Oral Health-A system approach-
5. Stephen L. Silverman and Ames F. Tryon, Series editor-Alvin F. Gardner- Community Dentistry-A problem oriented approach - P. G. Dental Hand book series Vol.8 by, PSG Publishing company Inc. Littleton Massachuseltts.
6. Geoffrey L. Slack and Brain Burt Dental Public Health- An Introduction to Community Dentistry.
7. Oral Health Surveys- Basic Methods, W. H. O. Geneva – 5th edition
8. Maxcy and Rosenau Preventive Medicine and Hygiene-15th edition
9. J. O. Forrest - Preventive Dentistry- 2nd edition
10. Murray- Preventive Dentistry - 1997
11. Park and park - Text Book of Preventive and Social Medicine by-23th edition
12. Dr. Soben Peter - Community Dentistry -5th edition
13. B. K. Mahajan - Introduction to Bio-statistics - (methods in biostatics)-6th edition
14. Research methodology and Bio-statistics – C R Kothari – 2nd edition
15. Grewal-Introduction to Statistical Methods
16. Primary preventive dentistry – Norman O Harris – 8th edition

5TH YEAR BDS – INTERNSHIP (TOTAL 12 MONTHS)

The following are the duration of rotatory internship postings in the respective Departments

Sl. No.	Department	Duration of postings
1	Oral Medicine & Radiology	1 month
2	Oral & Maxillofacial Surgery	1 ½ month
3	Prosthodontics and Crown & Bridge	1 ½ month
4	Periodontology	1 month
5	Conservative Dentistry and Endodontics	1 month
6	Paedodontics and Preventive Dentistry	1 month
7	Oral Pathology & Microbiology	15 days
8	Orthodontics & Dentofacial Orthopedics	1 month
9	Public Health Dentistry (Rural services)	3 months
10	Elective	15 days

Note: as per DCI gazette