**DENTAL**

# Revised Ordinance Governing

# Bachelor of Dental Surgery (BDS)

# Degree Course

# and Curriculum of Subjects – RS1


## SRI SIDDHARTHA ACADEMY OF HIGHER EDUCATION

*(Deemed to be University, declared u/s 3 of the UGC Act, 1956)*

**Agalakote, B.H. Road, Tumkur – 572107, Karnataka, India**

# SRI SIDDHARTHA ACADEMY OF HIGHER EDUCATION

*("Deemed to be University u/s 3 of the UGC Act, 1956")*

Accredited 'A' Grade by NAAC

**Agalakote, B.H.Road, Tumkur – 572 107.KARNATAKA, INDIA.**

No. SSAHE/ACA-S&C/03/BDS/2021 Date: 26/08/2021

## NOTIFICATION

Sub: Revised Ordinance pertaining to Regulations and Curriculum of Bachelor of Dental Surgery (BDS) for RS-1 Batch.

Ref: 1). Proceedings of BOS Dental (BDS) UG held on 12/08/2021
2). Proceedings of the Academic Council meeting held on 19/08/2021

In exercise of the powers vested under section 6 of 6.4 of MoA / Rules of SSAHE, the Revised Ordinance pertaining to Regulations and Curriculum of Bachelor of Dental Surgery (BDS) for RS-1 batch is notified herewith as per Annexure.

By Order,

REGISTRAR

To,
Dean / Principal, Sri Siddhartha Dental College & Hospital,

Copy to
1) Office of the Chancellor, SSAHE, for kind information,
2) PA to Vice-Chancellor / PA to Registrar / Controller of Examinations / Finance Officer, SSAHE
3) All Officers of the Academy Examination Branch / Academic Section
4) Guard File / Office copy.

## CONTENT

## SECTION – I

## INTRODUCTION

### GOALS :

The dental graduates during training in the institutions should acquire 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 graduate also should understand the concept of community oral health education and be able to participate in the rural health care delivery programmes existing in the country.

### OBJECTIVES :

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

### A. Knowledge and Understanding:

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

1. Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions ; 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 teeth, mouth and jaws and preventive diagnostic and therapeutic aspects of dentistry.
4. Adequate clinical experience required for general dental practice.
5. Adequate knowledge of the constitution, biological function and behavior 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 possible 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 of 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 CPED 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

### Duration of the Course:

The Undergraduate dental training programme leading to BDS degree shall be of 4 years with 240 teaching days in each academic year. During this period, the student shall be required to have engaged in full time study at a dental college recognized or approved by the Dental Council of India.

### Internship

Every candidate shall be required after passing the fourth BDS examination to undergo one year compulsory rotatory internship in a recognized DentalCollege.

### Attendance requirement, Progress and Conduct:

1. 75 % in theory and 75% in practical / clinical in each subject.
2. In case of a subject in which there is no university examination at the end of the academic year, the percentage of attendance shall not be less than 70% in lectures and practical / clinical. However, at the time of appearing for the professional examination in the subject, the aggregate percentage of attendance in the subject should satisfy condition(1) above.

### Subjects of Study

### First Year

1. General Human Anatomy including Embryology and Histology
2. General Human Physiology and Biochemistry, Nutrition and Dietics
3. Dental Anatomy, Embryology and Oral Histology
4. Dental Materials
5. Pre-Clinical Prosthodontics and Crown & Bridge

### Second Year

1. General Pathology & Microbiology
2. General & dental pharmacology & therapeutics
3. Dental Materials
4. Pre-Clinical Conservative Dentistry– Only Practical and Viva Voce
5. Pre-Clinical Prosthodontics – Only Practical and Viva Voce
6. Oral Pathology & Oral Microbiology

### Third Year

1. General Medicine
2. General Surgery
3. Oral Pathology and Oral Microbiology
4. Conservative Dentistry and Endodontics
5. Oral & Maxillofacial Surgery
6. Oral Medicine and Radiology
7. Orthodontics & Dentofacial Orthopaedics
8. Paediatric & Preventive Dentistry
9. Peridontology
10. Prosthodontics and Crown & Bridge

## Fourth Year

1. Orthodontics & Dentofacial Orthopaedics
2. Oral Medicine & Radiology
3. Paediatric & Preventive Dentistry
4. Periodontology
5. Oral & Maxiollofacial Surgery
6. Prosthodontics & Crown & Bridge
7. Conservative Dentistry and Endodontics
8. Public Health Dentistry

## TEACHING HOURS

### Minimum working hours for each subject of study

### I B.D.S

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

### II B.D.S

| Subject | Lecture Hours | Practical Hours | Clinical Hours | Total Hours |
|---|---|---|---|---|
| General & dental pharmacology & therapeutics | 70 | 20 | | 90 |
| General Pathology & Microbiology | 55<br>65 | 55<br>50 | | 110<br>115 |
| Dental Materials | 60 | 200 | | 260 |
| Oral Pathology & Oral Microbiology | 25 | 50 | | 75 |
| Pre-Clinical Prosthodontics & Crown and Bridge | 25 | 200 | | 225 |
| Pre-Clinical Conservative Dentistry | 25 | 200 | | 225 |
| **Total** | **325** | **775** | | **1100** |

## III B.D.S

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

## IV B.D.S

| Subject | Lecture Hours | Practical Hours | Clinical Hours | Total Hours |
|---|---|---|---|---|
| Oral Medicine & Radiology | 45 | | 100 | 145 |
| Paediatric & Preventive Dentistry | 45 | | 100 | 145 |
| Orthodontics & Dentofacial Orthopaedics | 30 | | 100 | 130 |
| Periodontology | 50 | | 100 | 150 |
| Oral & Maxiollofacial Surgery | 50 | | 200 | 250 |
| Conservative Dentistry and Endodontics | 80 | | 300 | 380 |
| Prosthodontics & Crown & Bridge | 80 | | 300 | 380 |
| Public Health Dentistry | 60 | | 200 | 260 |
| **Total** | **440** | | **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 3 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.
- The minimum working hours indicated each year of study does not include one month midyear vacation and one month of university examination.

## SECTION – III

## 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 the second year, 3rd B.D.S examination at the end of third, 4th B.D.S at the end of the 4th year. 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 the university.

### Internal Assessment of Examination:

The internal assessment examinations may be held frequently at least 3 times in a given academic year and the average marks of these examinations to 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.

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

### Theory Examination:

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

### Practical & Clinical Examination:

**(a). Objective structure Clinical Evaluation**:

The present system of conducting practical and clinical examination at several universities provide chance for unrealistic proportions of luck. Only a particular clinical procedure or experiment is usually given for the examination. The clinical and practical examination should provide a number of changes 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 method of objective structured clinical examinations should be followed. This will avoid examiner bias because both the examiner and the examinee are given specific instructions on what is to be observed at each station.

**(b). Records / Log Books :**

The candidate should be given credit for his records based on the work done.

**(c ) Scheme of clinical and practical examinations :**

The specific scheme of clinical and practical examinations, the type of clinical procedures/ experiments to be performed and marks allotted for each are to be discussed and finalized by the Chairman and other examiners and it is to be published prior to the conduct of the examinations along with the publication of the time table for the practical examinations. This scheme should be brought to the notice of the external examiner as and when the examiner reports. The practical and clinical examinations should be evaluated by two examiners of which one shall be an external examiner appointed from other universities preferably outside the state. Each candidate should be evaluated by each examiner independently and marks computed at the end of the examination

**(d). 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 dived equally amongst the examiners, i.e., 10 marks per examiner.

**Subject of Examination**

**I BDS Examination: Total : 600 Marks**

1. General Anatomy including embryology and Histology
2. General Human physiology & Biochemistry
3. Dental Anatomy, Embryology and Oral Histology

**II BDS Examination : Total : 800 Marks**

1. General pathology and Microbilogy
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 BDS Examination :** **Total : 600 Marks**

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

**IV BDS Examination :** **Total : 1600 Marks**

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

**Marks Distribution in Each Subject :**

Each subject shall have a maximum of 200 marks:

| | | |
|---|---|---|
| Theory | - | 100 |
| Practical / Clinical | - | 100 |

**Theory – 100**

| | | |
|---|---|---|
| University written exam | - | 70 |
| Viva-Voce | - | 20 |
| Internal assessment | - | 10 |
| Total | | 100 |

**Practicals / Clinicals – 100**

| | |
|---|---|
| University Exam | -90 |
| Internal Assessment | -10 |
| Total | 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:

| Type of Questions | No. of Questions | Marks per question | Total marks |
|---|---|---|---|
| Long Essay Type | 1 | 10 | 10 |
| Short Essay Type | 4 | 5 | 20 |
| Short Answer Type | 13 | 2 | 26 |
| Multiple choice questions | 14 | 1 | 14 |
| | | **Grand Total** | **70** |

**Distribution of marks:**

**I B.D.S**

| Subject | Theory | | | | Practical / Clinicals | | | Grand Total |
|---|---|---|---|---|---|---|---|---|
| | University Paper | Viva Voce | I.A | Total | University Exam | I.A | Total | |
| General Human Anatomy including Embryology and Histology | 70 | 20 | 10 | 100 | 90 | 10 | 100 | 200 |
| General Human Physiology | 35 | 10 | 5 | 50 | 45 | 5 | 50 | 100 |
| Biochemistry, Dental Anatomy, Embryology and Oral Histology | 35<br>70 | 10<br>20 | 5<br>10 | 50<br>100 | 45<br>90 | 5<br>10 | 50<br>100 | 100<br>200 |
| | Total | | | 300 | Total | | 300 | 600 |

**Note** : In the subject of Gen. Human Physiology (Section A) and Biochemistry, Nutrition & Dietics (Section B) the distribution of marks and types of questions will be as follows :

| Subject | Type of Questions | No. of Questions | Marks per question | Total marks |
|---|---|---|---|---|
| Gen. Human Physiology | Long Essay Type | 01 | 10 | 10 |
| | Short Essay Type | 02 | 05 | 10 |
| | Short Answer Type | 04 | 02 | 08 |
| | Multiple choice questions | 07 | 01 | 07 |
| | | | **Gross Total** | **35** |
| Biochemistry, Nutrition & Dietics | Long Essay Type | 01 | 10 | 10 |
| | Short Essay Type | 02 | 05 | 10 |
| | Short Answer Type | 04 | 02 | 08 |
| | Multiple choice questions | 07 | 01 | 07 |
| | | | **Gross Total** | **35** |

## II B.D.S

| Subject | Theory | | | | Practical / Clinicals | | | Grand Total |
|---|---|---|---|---|---|---|---|---|
| | University Paper | Viva Voce | I.A | Total | University Exam | I.A | Total | |
| General & dental pharmacology & therapeutics | 70 | 20 | 10 | 100 | 90 | 10 | 100 | 200 |
| General Pathology | 35 | 10 | 05 | 50 | 45 | 5 | 50 | 100 |
| Microbiology | 35 | 10 | 05 | 50 | 45 | 5 | 50 | 100 |
| Dental Materials | 70 | 20 | 10 | 100 | 90 | 10 | 100 | 200 |
| *Pre-Clinical Prosthodontics | No theory paper, Practical / Viva Voce only | 20 | - | 20 | 60 | 20 | 80 | 100 |
| *Pre-Clinical Conservative Dentistry | | 20 | - | 20 | 60 | 20 | 80 | 100 |
| | Total | | | 340 | Total | | 460 | 800 |

**Note-1 : A candidate who has not successfully completed the 1st B.D.S examination can not appear in the II Year Examination**

**Note-2 : In the subject of Gen. Pathology (Section A) and Microbiology (Section B) the distribution of marks and types of questions will be as follows :**

| Subject | Type of Questions | No. of Questions | Marks per question | Total marks |
|---|---|---|---|---|
| General Pathology | Long Essay Type | 01 | 10 | 10 |
| | Short Essay Type | 02 | 05 | 10 |
| | Short Answer Type | 04 | 02 | 08 |
| | Multiple choice questions | 07 | 01 | 07 |
| | | | **Gross Total** | **35** |
| Microbiology | Long Essay Type | 01 | 10 | 10 |
| | Short Essay Type | 02 | 05 | 10 |
| | Short Answer Type | 04 | 02 | 08 |
| | Multiple choice questions | 07 | 01 | 07 |
| | | | **Gross Total** | **35** |

## III B.D.S

| Subject | Theory | | | | Practical / Clinicals | | | Grand Total |
|---|---|---|---|---|---|---|---|---|
| | University Paper | Viva Voce | I.A | Total | University Exam | I.A | Total | |
| General Medicine | 70 | 20 | 10 | 100 | 90 | 10 | 100 | 200 |
| General Surgery | 70 | 20 | 10 | 100 | 90 | 10 | 100 | 200 |
| Oral Pathology and Oral Microbiology | 70 | 20 | 10 | 100 | 90 | 10 | 100 | 200 |
| | Total | | | 300 | Total | | 300 | 600 |

**Note : A candidate who has successfully completed the 2nd B.D.S examination can appear in the 3rd B.D.S. Examination**

## IV B.D.S

| Subject | Theory | | | | Practical / Clinicals | | | Grand Total |
|---|---|---|---|---|---|---|---|---|
| | University Paper | Viva Voce | I.A | Total | University Exam | I.A | Total | |
| Oral Medicine & Radiology | 70 | 20 | 10 | 100 | 90 | 10 | 100 | 200 |
| Paediatric & Preventive Dentistry | 70 | 20 | 10 | 100 | 90 | 10 | 100 | 200 |
| Orthodontics & Dentofacial Orthopaedics | 70 | 20 | 10 | 100 | 90 | 10 | 100 | 200 |
| Periodontology | 70 | 20 | 10 | 100 | 90 | 10 | 100 | 200 |
| Prosthodontics and CrownBridge | 70 | 20 | 10 | 100 | 90 | 10 | 100 | 200 |
| Conservative Dentistry and Endodontics | 70 | 20 | 10 | 100 | 90 | 10 | 100 | 200 |
| Oral & Maxillofacial Surgery | 70 | 20 | 10 | 100 | 90 | 10 | 100 | 200 |
| Public Health Dentistry | 70 | 20 | 10 | 100 | 90 | 10 | 100 | 200 |
| | Total | | | 800 | Total | | | 1600 |

**Note: A candidate who has successfully completed the 3rd B.D.S examination can appear in the 4th B.D.S. Examination**

**Eligibility to appear in University Examination:**

A candidate who has failed in any one subject only in I year, II year, III year BDS University examination shall be permitted to go to next higher BDS class and may be allowed to appear in that subject in subsequent examinations. However, he/she has to pass the University examination in that subject before he/she is allowed to take next higher BDS university examination.

**Criteria to Pass in the University Examination:**

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;

1. For pass in Theory, a candidate shall secure 50% marks in aggregate in University theory examination i.e. marks obtained in University written examination, viva voce examination and internal assessment (theory) combined together i.e. fifty out of One hundred.
2. In the University Practical / clinical examination, a candidate shall secure 50% of University Practical marks i.e.45/90 marks and 50% of total marks in aggregate i.e. Practical / Clinical and Internal Assessment combined together i.e. 50/100 marks.
3. In case of pre-clinical Prosthetic Dentistry and Pre-Clinical Conservative Dentistry, Where there is no written examination, minimum for pass is 50% of marks in Practical and Viva voce combined together in University Examination (i.e.40/80 marks) and 50 % of marks in aggregate including Internal Assessment i.e. 50/100.
4. **GRACE MARKS:** Grace marks upto a maximum of 5 marks may be awarded to students who have failed only in one subject but passed in all other subjects.
5. 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.A candidate who will pass the whole examination in the first attempt will be eligible for distinction or class.

**Re-totalling** :

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.

# SECTION – IV

# Syllabus of Study

# HUMAN ANATOMY, EMBRYOLOGY, HISTOLOGY & MEDICAL GENETICS

**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 structure, so that relevance anatomical & scientific foundations are laid down for the clinical years of the BDS course.

**OBJECTIVES:**

**a. Knowledge & Understanding**

At the end of the I$^{st}$ year BDS course in Anatomical Sciences the undergraduate student isexpected to:

I. Know the normal disposition of the structures in the body while clinically examininga patient and while conducting clinical procedures.
II. Know the anatomical basis of disease and injury.
III. Know the microscopic structure of the various tissues, a pre-requisite for understandingof the disease processes.
IV. Know the nervous system to locate the site of lesions according to the sensory and ormotor deficits encountered.
V. Have an idea about the basis of abnormal development, critical stages of development,effects of teratogens,, genetic mutations and environmental hazards.
VI. Know the sectional anatomy of head neck and brain to read the features in radiographsand pictures taken by modern imaging techniques.
VII. Know the anatomy of cardio-pulmonary resuscitation.

**b) Skills**

I. To locate various structures of the body and to mark the topography of the living Anatomy
II. To identify various tissues under microscope.
III. To identify the features in radiographs and modern imaging techniques.
IV. 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 alive in the learner curious 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 or radiographs & other modern imaging techniques.

8. Study of Histology slides.
9. Study of embryology models
10. Audio-Visual aids

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

**d) An Outline of The Course Content:**

I. General anatomy: Introduction of anatomical terms and brief outline of various systems of the body.
II. Regional anatomy of head & neck with osteology of bones of head & neck, with emphasis on topics of dental importance.
III. General disposition of thoracic, abdominal & Pelvic organs.
IV. The regional anatomy of the sites of intramuscular & intra vascular injections, & lumbar puncture.
V. General embryology & systemic embryology with respect to development of head & neck.
VI. Histology of basic tissues and of the organs of gastrointestinal, respiratory Endocrine, excretory systems & gonads.
VII. Medical genetics.

**e)Further Details Of The Course.**

**THEORY** **Teaching Hrs 100**

**I. INTRODUCTION TO:**

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

**II. HEAD & NECK:**

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

## III. THORAX: Demonstration on dissected specimen of

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

## IV. ABDOMEN: Demonstration on a dissected specimen of

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

## V. CLINICAL PROCEDURES:

a. Intramuscular injections: Demonstration on a dissected specimen and on a living person of the following sites of injection
   i. Deltoid muscle and its relation to the axillary nerve and radial nerve
   ii. Gluteal region and the relation of the sciatic nerve
   iii. Vastus lateralis muscle.

b. Intravenous injections & venesection: Demonstration of veins in the dissected specimen and on a living person.
   i. Median cubital vein 2. Cephalic vein 3. Basilic vein 4. Long saphenous vein

c. Arterial pulsations: Demonstration of arteries on a dissected specimen and feeling of pulsation of the following arteries on a living person.
   i. Superficial temporal 2. Facial 3. Carotid 4. Axillary .5.Brachial 6. Radial 7. Ulnar 8. Femoral 9. Popliteal 10. Dorsalispedis

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

## VI. EMBRYOLOGY :

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

## VII. HISTOLOGY:

The Cell:

Basic tissues – Epithelium, connective tissue including cartilage and bone, muscle Tissue, Nervous tissue: Peripheral nerve, optic nerve, sensory ganglion motor ganglion, skin

Classification of Glands

Salivary glands (Serous, mucous and mixed gland), Blood vessels, Lymphoid tissue Tooth, lip tongue, hard palate, oesphagus, stomach, duodenum, ileum, colon vermiform appendix Liver, pancreas, Lung, Trachea, Epiglottis, Thyroid

gland, para thyroid gland, supra renal gland and pituitary gland, kidney, Ureter, Urinary bladder, Ovary and testis .

## VIII. MEDICAL GENETICS:

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

## PRACTICALS Teaching hrs 175

The following topics are included for examination – MUST KNOW.

### Dissection Topics:

1. Scalp
2. face including deeper dissection
3. Posterior triangle of neck
4. Anterior triangles of neck –
    i. Median region
    ii. Digastric
    iii. Carotid triangles
5. Deep dissection of neck –
    i. Thyroid gland
    ii. Great vessels of neck
6. parotid region
7. infra temporal fossa –
    i. muscles of mastication
    ii. mandibular nerve and its branches
    iii. maxillary artery
    iv. 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

**SurfaceAnatomy: (to be included in practicals only)**

MUST KNOW

Superior sagittal sinus; middle meningeal artery; pterion; facial artery ; parotid gland and duct; facial nerve on face; common, external, internal carotid arteries; palatine tonsil; vocal cards; thyroid gland, spinal accessory nerve.

**Radiological Anatomy : (Practicals only)**

MUST KNOW

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

**Histology Slides :- for Practical exam as Spotters & for Discussion.**

01. Epithelium – simple squamous (mesentry)
02. Epithelium – simple Cuboidal (thyroid)
03. Epithelium – simple Columnar (Gallbladder)

04. Epithelium – simple Ciliated columnar
05. Epithelium – simple Pseudo – stratified ciliated columnar (Trachea)
06. Epithelium – simple Compound stratified squamous kertinised (skin)
07. Epithelium – simple Compound stratified squamous non-keratinised (oesophagus)
08. Compound – transitional (urinary bladder)
09. 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. Pripherall nerve & ganglia
17. serous salivary glade
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. tongue
27. trachea
28. oesophagus
29. lung
30. thyroid & parathyroid
31. pituitary
32. suprarenal gland
33. pancreas

**Desirable to know (to be Demonstrated)**

1. Ear – external, middle & internal
2. spinal cord;
3. brain stem
4. cerebellum
5. cerebral hemispheres – important gyri & sulci of superolateral, medial and inferior surfaces;
   functional areas – sensory, motor, auditory, visual, gustatory speech & splanchnic areas; blood supply of brain;

6. cranial nervers in general with functions other than V,VII,IX,XII.
7. Genetics – definitions, chromosomes, chromosomal aberrations;
8. anthropology
9. organs of thorax and abdomen
10. extremities – upper & lower limbs
11. Histology of
    a. Stomach – fundus and pylorus
    b. Small intestine – duodenum, jejunum & ileum
    c. Large intestine – colon and appendix
    d. Liver and gall bladder

## RECOMMENDED BOOKS :


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


## CLINICAL / PRACTICALUNIVERSITY EXAMINATION 90 Marks

**Gross Anatomy**

1. Spotters carrying 2 marks each : 10 X 02 = 20 marks
2. discussion on ONE give dissected specimen : 01 X 15 = 15 marks
3. Surface Anatomy : 01 X 15 = 15 marks

**Histology**

1. Identification of 10 Slides of 2 marks each : 10 X 02 = 20 marks
2. Discussion on TWO given slides : 02 X 10 = 20 marks
   (One General and one Systemic)

# HUMAN PHYSIOLOGY

## GOAL

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

## OBJECTIVES

### a) Knowledge

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

I. Explain the normal functioning of all the organ systems and their interactions for well co-ordinated total body function
II. Assess the relative contribution of each organ system towards the maintenance of the milieu interior.
III. 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:

I. Conduct experiments designated for the study of physiological phenomena
II. Interpret experimental and investigative data
III. 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 and integrated knowledge of organ structure and function and its regulatory mechanisms.

## COURSE CONTENTS THEORY Teaching Hrs - 120

1. **General Physiology: 04**
   1. Homeostasis: Basic concept, feedback mechanisms
   2. Structure of cell membrane, transport across cell membrane
   3. Membrane potentials

2. **Blood: 15**

   Composition & functions of blood

   Specify gravity, packed cell volume, factors affecting & methods of determination.

   Plasma proteins-Types, concentration functions & variations.

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

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

Haemoglobin- Normal concentration, method of determination & variation in concentration.
Blood Indices- MCV, MCH, MCHC-defination, normal values, variation.
Anaemia- Defination, classification, life span of RBC'S destruction of RBC'S, formation & fate of bile pigments, Jaundice-types.

**Leucocytes:** Classification, number percentage, distribution morphology, properties functions & variation. Role of lymphocytes in immunity, leucopoiesis life span & fate of leucocytes.
Thromobocytes- Morphology, number, variations, function & thromobopoiesis.
Haemostatsis- Role of vasoconstriction, platelet plug formation in haemostasis, coagulation factors, intrinsic & extrinsic pathways of coagulation, clot retraction.
Tests of haemostatic function, platelet count, clotting time, bleeding time, prothrombin time-normal values, method & variations, Anticoagulants-Mechanism of action. Bleeding disorders.
Blood Groups: ABO & Rh system, method of determination, importance, indications& dangers of blood transfusion, blood substitutes.
Blood volume: Normal values, variations
Body fluids: distribution of total body water, intracellular & extracellular compartments, Tissue fluids & lymph: Formation of tissue fluid, Composition, circulation & functions of lymph. Oedema-causes.
Functions of reticulo endotrelial system

**3. Muscle and Nerve- 08**

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

**4. Digestive system:-10**

Introduction to digestion: General structure of G.I. tract, innervation.
Salivary glands: Structure of salivary glands, composition, regulation of secretion & functions of saliva.
Stomach: Composition and functions of gastric juice, mechanism and regulation of gastric secretion.
Exocrine Pancreas- Structure, composition of pancreatic juice, functions of each component, regulation of pancreatic secretion.
Liver :Structure, composition of bile, functions of bile, regulations of secretion-Gall bladder : Structure, functions
Small intestine-Composition, functions & regulation of secretion of intestinal juice.
Large intestine- Functions.
Motor functions of GIT: Mastication, deglutition, gastric filling & emptying, movements of small and large intestine, defecation.

**5. Excretory System - 08**

Structure & functions of kidney, functional unit of kidney & functions of different parts juxta glomerular apparatus, renal blood flow.

Formation of Urine: Glomerular filtration rate-definition, determination, normal values, factors influencing G.F.R. Tubular reabsorption– Reabsorption of sodium, glucose, water & other substances. Tubular secretion-secretion of urea, hydrogen and other substances. Mechanism of concentration & dilution of urine.
Role of kidney in the regulation of $P^H$ of the blood.
Micturition :anatomy & innervation of Urinary bladder, mechanism of miturition & abnormalities.

**6. Body Temperature & Functions Of Skin - 02**

**7. Endocrinology – 14**

General endocrinology-Enumeration of endocrine glands & hormones – General function of endocrine system, chemistry mechanism of secretion, transport, metabolism, regulation of secretion of hormones.
Hormones of anterior pituitary & their actions, hypothamic regulation of anterior pituitary function. Disorders of secretion of anterior pituitary hormones.
Posterior Pituitary: Functions, regulation & disorders of secretion.
Thyroid: Histology, synthesis, secretion & transport of hormones, actions of hormones, regulation of secretion & disorders, Thyroid function tests.
Adrenal cortex & medulla- synthesis, secretion, action, metabolism, regulation of secretion of hormones & disorders.
Other hormones –Angiotensin, A.N.F.

**8. Reproduction - 06**

Sex differentiation, physiological anatomy of male and female sex organs, Female reproductive system: Menstrual cycle, functions of ovary, actions of oestrogen & progesterone, control of secretion of ovarian hormones, tests for ovulation , fertilization, implantation, maternal changes during pregnancy, pregnancy tests & parturition. Lactation, composition of milk, factors controlling lactation, milk ejection reflex, male reproductive system: spermatogenesis, semen and contraception.

**9. Cardio Vascular System - 15**

Functional anatomy and innervation of heart properties of cardiac muscle Origin & propagation of cardiac impulse and heart block.
Electrocardiogram- Normal electrocardiogram. Two changes in ECG in myocardial infarction.
Cardiac cycle- Phases, Pressure changes in atria, ventricles & aorta.
Volume changes in ventricles, Jugular venous pulse, arterial pulse.
Heart sounds: Mention of murmurs.
Heart rate: Normal value, Variation & regulation.
Cardiac output: Definition, normal values, one method of determination, variation, factors affecting heart rate and stroke volume.
Arterial blood pressure: Definition , normal values & variations, determinants, regulation & measurement of blood pressure.
Coronary circulation.
Cardio vascular homeostasis- Exercise & posture.

## 10. Respiratory System – 12

Physiology of Respiration: External & internal respiration.
Functional anatomy of respiratory passage & lungs.
Respiratory movements: Muscles of respiration, Mechanism of inflation & definition of lungs. Intra pleural & intra pulmonary pressures & their changes during the phases of respiration. Mechanics of breathing-surfactant, compliance& work of breathing.
Spirometry: Lung volumes & capacities definition, normal values, significance, factors affecting vital capacity, variations in vital capacity, FEV & its variations.
Pulmonary ventilation-alveolar ventilation & dead space-ventilation.
Composition of inspired air, alveolar air and expired air.
Exchange of gases: Diffusing capacity, factors affecting it.
Transport of oxygen & carbon dioxide in the blood.
Regulation of respiration –neural & chemical
Hypoxia, cyanosis, dyspnoea, periodic breathing.
Artificial respiration, pulmonary function tests.

## 11. Central Nervous System – 10

1. Organisation of central nervous system
2. Neuronal organization at spinal cord level
3. Synapse receptors, reflexes, sensations and tracts
4. Physiology of pain
5. Functions of cerebellum, thalamus, hypothalamus and cerebral cortex.
6. Formation and functions of CSF.
7. Autonomic nervous system

## 12. Special Senses - 18

Fundamental knowledge of vision, hearing taste and smell.

## PRACTICALS — Teaching Hrs - 60

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 give in the form of charts, graphs and calculations for interpretation by the students.

### PROCEDURES

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

**DEMONSTRATION:**

1. Determination of packed cell volume and erythrocyte sedimentation rate
2. Determination of specific gravity of blood
3. Determination of erythrocyte fragility
4. Determination of vital capacity and timed vital capacity
5. Skeletal muscle experiments.
   Study of laboratory appliances in experimental physiology, Frog's gastrocneminus sciatic preparation. Simple muscle curve, effects of tow successive stimuli, effects of increasing strength of stimuli, effects of temperature, genesis of fatigue and tetanus. Effect of after load and free load on muscle contraction, calculation of work done.
6. Electrocardiography: Demonstration of recording of normal Electro cardiogram
7. Clinical examination of cardiovascular and respiratory system.

**Text books:**

Human Physiology for BDS – A K Jain
Textbook of Human Physiology for Dental Students – Indu Khurana
Concise textbook of Physiology for Dental Students – Yogesh Tripathi
Textbook of Medical Phsiology for Dental Students – G K Pal

**Books for reference :**

Berene & Levey; Physiology, 2nd edition
West-Best & Taylor's, Physiological basis of Medical Practise, 11th ed.

**Experimental Physiology**

Ghai; a text book of practical physiology
Hutchison's; Clinical Methods, 20th edition.

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION 45 Marks**

Major Experiments - 25 Marks
Any one of the Major Experiments

1. R.B.C. Count
2. W.B.C. Count
3. Differential Count
4. Blood Pressure Recording

Minor Experiments - 20 Marks
Any one of the Major Experiments

1. Determination of Blood Groups
2. determination of Bleeding & Clotting time
3. Haemoglobin Estimation
4. Calculation of absolute Haematological Indices – MCH, MCV, MCHC

# BIOCHEMISTRY

## AIMS AND SCOPE OF THE COURSE IN BIOCHEMISTRY

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

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

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 activates. 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 to9 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.
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 glycoginesis. 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 if 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 prolulhydroxylaseshould know why the gum bleeds in scurvy.
11. Need not know the structure of Vitamin k. should know the basis of internal bleeding arising due to its deficiency.
12. Need not remember the structure of HMGCOA. Should know why it does not lead to increased cholesterol synthesis in starvation.

## BIOCHEMISTRY AND NUTRITION Teaching Hrs - 70

### 1. Chemistry Of Bloorganic Molecules

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

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

Proteins: Biological importance. Amioacids: classification. Introduction to peptides. Proteins : Simple and conjugated; globular and fibrous. Charge properites. Buffer action Introduction to protein conformation Denaturation.

Nucleic acids: Building units Nucleotides. Outline structure of DNA and RNA. High energy compounds: ATP, Phoshorylamindines, Thiolesters, Enol phosphates.

### 2. Macronuterients And Digenstion

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 caloric malnutrition. Balance diet.

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

### 3. Micronutrients

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

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

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

**4.Energy Metabolism**

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

**5. Special Aspects Of Metabolism**

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

**6.Biochemical Genetics And Protein Synthesis**

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

**7. Enzyme And Metabolic Regulation**

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

**8. Structural Components And Blood Proteins**

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

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

**9. Medical Biochemistry**

Regulation of blood glucose. Diabetes mellitus and related disorders. Evaluation of glycemic status. Hyperthyroidism and hypothyroidism: Biochemical evaluation. Hyperlipopteinemias 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. inborn errors of amino acid metabolism and muscular dystrophy ( one or two examples with biochemical basis will be adequate). Serum enzymes in diagnosis.

**PRACTICALS :** **Teaching Hrs- 60**

1. Qualitative analysis of carbohydrates
2. Colour 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 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 demonstration
13. Paper electrophoresis charts / clinical data evaluation
14. Glucose tolerance test profiles
15. Serum lipid profiles
16. Profiles of hypothyrodisim and hyperthyroidisim
17. Profiles of hyper and hypoparathyroidism
18. Profiles of liver function
19. Urea, uric acid creatinine profile in kidney disorders
20. Blood gas profile in acidosis / alkalosis

**Recommended Books**

1. Concise text book of Biochemistry – TN Pattabiraman
2. Nutritional Biochemistry – S Ramakrishna And SV Rao
3. Lecture notes on Biochemistry – JK Kandlish
4. Text book of Biochemistry for Dental Students – DM Vasudevar
5. Biochemistry for Dental Students – U Sathyanarayana

**Reference books:**

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

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION** **45 Marks**

| | | |
|---|---|---|
| 1. One procedure for quantitative estimation | = | 15 marks |
| 2. One procedure for qualitative analysis | = | 15 marks |
| 3. Clinical Biochemistry | = | 15 marks |
| Total | = | 45 marks |

**The following are suggested:**

**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 Jaffes's method

**Quantitative Estimation (Any ONE analysis to be done)**

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

# DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY

**Introduction** **Teaching Hrs. 105**

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

**Skills**

The student should acquire basic skills in :

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

**Objectives**

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

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

## I. TOOTH MORPHOLOGY

1. Introduction to tooth morphology:
   - Human dentition, types of teeth, & functions, Palmer's & Binomial notation systems, tooth surfaces, their junctions – line angles & point angles, definition of terms used in dental morphology, geometric concepts in tooth morphology, contact areas & embrasures – Clinical significance.

2. Morphology of permanent teeth :
   - Description of individual teeth, along with their endodontic anatomy & including a note on their chronology of development, differences between similar class of teeth & identification of individual teeth.
   - Variations & Anomalies commonly seen in individual teeth.

3. Morphology of Deciduous teeth:
   - Generalised differences between Deciduous & Permanent teeth.
   - Description of individual deciduous teeth, including their chronology of development, endodontic anatomy, difference between similar class of teeth & identification of individual teeth.

4. Occlusion:
    - Definition, factors influencing occlusion – basal bone, arch, individual teeth, external & internal forces & sequence of eruption.
    - Inclination of individual teeth – compensatory curves
    - Centric relation & Centric occlusion – protrusive, retrusive & lateral occlusion.
    - Clinical significance of normal occlusion.
    - Introduction to & Classification of malocclusion.

## II. ORAL EMBRYOLOGY

1. Brief review of development of face, jaws, lip, palate & tongue, with applied aspects.
2. Development of teeth:
    - Epithelial mesenchymal interaction, detailed study of different stages of development of crown root & supporting tissues to tooth & detailed study of formation of calcified tissues.
    - Applied aspects of disorders in development of teeth.

3. Eruption of deciduous & Permanent teeth:
    - Mechanisms in tooth eruption, different theories & histology of eruption, formation of dentogingival junction, role of gubernacular cord in eruption of permanent teeth.
    - Clinical or Applied aspects of disorders of eruption.

4. Shedding of teeth :
    - Factors & mechanisms of shedding of deciduous teeth.
    - Complications and clinical considerations of shedding.

## III. ORAL HISTOLOGY

1. Detailed microscopic study of Enamel, Dentine, Cementum & Pulp tissue. Age changes &applied aspects (Clinical and forensic significance) of histological consideration – Fluoride applications, transparent dentine, dentine hypersensitivity, reaction of pulp tissue to varying insults to exposed dentin; pulp calcifications and hypercementosis.
2. Detailed microscopic study of Periodontal ligament & alveolar bone, age changes histological changes in periodontal ligament & bone in normal & orthodontic tooth movement, applied aspects of alveolar bone resorption.
3. Detailed microscopic study of Oral Mucosa, variation in structure in relation to functional requirements, mechanisms of keratinisation, clinical parts of gingiva, Dentogingival & Mucocutaneous junctions & lingual papillae(specialized Mucosa). Age changes & clinical considerations.
4. Salivary glands:
    - Detailed microscopic study of acini & ductal system.
    - Function, composition and formation of saliva.
    - Age changes & clinical considerations.

5. TM joint :
    - Review of development, basic anatomical aspects & microscopic study & clinical considerations.
6. Maxillary Sinus:
    - Microscopic study, anatomical variations, functions & clinical relevance of maxillary sinus in dental practice.
7. Processing of Hard & soft tissues for microscopic study:
    - Ground sections, decalcified sections & routine staining procedures
8. Basic Histochemical staining patterns of oral tissues.

## IV. ORAL PHYSIOLOGY

1. Saliva:
    - Composition of saliva- variations, formation of saliva & mechanisms of secreation, salivary reflexes, brief review of secretomotor pathway, functions, role of saliva in dental caries & applied aspects of hyper & hypo salivation.
2. Mastication :
    - Masticatory force & its measurement – need for mastication, peculiarities of masticatory muscles, masticatory cycle, masticatory reflexes & neural control of mastication.
3. Deglutition :
    - Review of the steps in deglutition, swallowing in infants, neural control fo deglutition and dysphagia.
4. Calcium, phosphorous & fluoride metabolism :
    - Source, requirements, absorption, distribution, functions & excretion, clinical considerations, hypo & hypercalcemia & hyper & Hypo phosphatemia & fluorosis.
5. Theories of Mineralisation :
    - Definition, mechanisms, theories & their drawbacks.
    - Applied aspects of physiology of mineralization, pathological considerations – calculus formation.
6. Physiology of Taste:
    - Innervation of taste buds & taste pathway, physiologic basis of taste sensation, age changes & applied aspects – taste disorders.
7. Physiology of Speech:
    - Review of basis 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.

## PRACTICALS Teaching Hrs. 250

**Dental Anatomy**

- Carving on wax block
    - Cube, rectangle, cylinder, cone

- Individual teeth (both the arches)
    - Central incisor
    - Lateral incisor
    - Canine
    - 1st premolar
    - 2nd premolar
    - 1st molar
    - 2nd molar

**Oral histology**

Preparation of ground section, studying under microscope and identify the structures - 01

List of histology slides

- Development of tooth
    - Bud stage
    - Cap stage
    - Early bell stage
    - Late bell stage
    - Root formation
- Enamel
    - Enamel rods
    - Hunter – Schreger bands
    - Tufts, lamellae, spindles
    - Incremental lines (L.S and T.S)
    - Neonatal line
    - Gnarled enamel
- Dentin
    - DEJ
    - Dentinal tubules (ground section and decalcified, H&E stained section)
    - Incremental lines of Von Ebner
    - Contour lines of Owen
    - Neonatal line
    - Tomes granular layer
    - Secondary dentin
    - Interglobular dentin, Intra tubular dentin & Inter tubular dentin
    - Sclerotic dentin
    - Dead tracts
    - Tertiary dentin
- Pulp
    - Zones of pulp (coronal pulp)
    - Radicular pulp
    - Pulp stones
- Cementum
    - Cellular cementum
    - Acellular cementum
    - CEJ – Overlap type
        - Butt type

- Gap type
- Sharpey's fibers
- Hypercementosis

- Periodontal ligament – Principal fibers – alveolar crest, horizontal, oblique, apical, interradicular and transeptal fibers.
- Alveolar bone
  - Haversian system
  - Trabeculated bone
  - Mature and immature bone
- Salivary glands
  - Serous gland
  - Mucous gland
  - Mixed gland
- Maxillary sinus – sinus lining
- Oral mucous membrane
  - Parakeratinised epithelium
  - Orthokeratinised epithelium
  - Nonkeratinised epithelium
  - Palate – anterolateral zone
    - Posterolateral zone
  - Alveolar mucosa
  - Vermillion border of lip
  - Tongue
    - Circumvallate papillae
    - Fungiform papillae
    - Filiform papillae
    - Foliate papillae
  - Dentogingival junction
  - Skin
- TMJ (desirable to know)

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION 90 Marks**

1. Carving of tooth on wax block– 30 marks
2. Spotters – identification of slides – 10 slides X 4 marks= 40 marks
   - Tooth identification – 3 teeth X 4 marks= 12 marks
   - Age assessment & tooth numbering system – 2 casts X 4 marks= 8 marks

## RECOMMENDED TEXT BOOKS


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

# GENERAL PATHOLOGY

**AIM:**

At the end of the course the student should be competent to:
Apply the scientific study of disease processes, which result in morphological and functional alterations in cells, tissues and organs to the study of pathology and the practice of dentistry.

**OBJECTIVES:**

Enabling the Student

1. To demonists and analyze pathological charges at macroscopically and microscopically 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.
3. To demonstrate understanding of the capabilities and limitations of morphological pathology in its contribution to medicine, dentistry and biological research.
4. To demonstrate ability to consult resource materials out side lectures, laboratory and tutorial classes.

**COURSE CONTENT** **Teaching Hrs - 55**

**A. GENERAL PATHOLOGY –**

1. Introduction to Pathology
   Terminologies
   The cell in health
   The normal cell structure
   The cellular functions
2. Aetiology and Pathogenesis of Disease
   Cell Injury
   Types – Congenital
   Acquired
   Mainly Acquired causes of disease
   (Hypoxic injury, chemical injury, physical injury, immunological injury)
3. Degenerations
   Amyloidosis
   Fatty charge
   Cloudy swelling
   Hyaline changes, mucoid degeneration
4. Cell death & Necrosis
   Apoptsis
   Def, causes, features and types of necrosis
   Gangrene – Dry, wet, gas
   Pathological Calcifications
   (Dystrophic and metastatic)
5. Inflammation
   - Definition, causes types, and features
   - Acute inflammation

a. The vascular response
b. The cellular response
c. Chemical mediators
d. The inflammatory cells
e. Fate
    - Chronic inflammation

Granulomations inflammation

6. Healing
    - Regeneration
    - Repair

a. Mechanisms
b. Healing by primary intention
c. Healing by secondary intention
d. Fracture healing
e. Factors influencing process
f. Complications

7. Tuberculosis
    - Epidemiology
    - Pathogenesis (Formation of tubercle)
    - Pathological features of Primary and secondary TB
    - Complications and Fate
8. Syphilis
    - Epidemiology
    - Types and stages of syphilis
    - Pathological features
    - Diagnostic criterias
    - Oral lesions
9. Typhoid
    - Epidemiology
    - Pathogenesis
    - Pathological features
    - Diagnostic criterias
10. Thrombosis
    - Definition, Pathophysiology
    - Formation, complications & Fate of a thrombus
11. Embolism
    - Definition
    - Types
    - Effects
12. Ischaemia and Infraction
    - Definition, etiology, types
    - Infraction of various organs
13. Derangements of body fluids
    - Oedema – Pathogenesis

      Different types
14. Disorders of circulation
    - Hyperaemia
    - Shock
15. Nutritional Disorders
    - Common Vitamin Deficiencies

16. Immunological mechanisms in disease
    - Humoral & cellular immunity
    - Hypersensitivity & autommunity
17. AIDS and Hepatitis
18. Hypertension
    - Definition, classification
    - Pathophysiology
    - Effects in various organs
19. Diabetes Mellitus
    - Def, Classification, Pathogenesis, Pathology in different organs
20. Adaptive disorders of groth
    - Atrophy & Hyperthophy, Hyperplasia, Metaplasis and Dysplasia
21. General Aspects of neoplasia
    a. Definition, terminology, classification
    b. Differences between benign and malignant neoplasms
    c. The neoplastic cell
    d. Metastasis
    e. Aetiology and pathogenesis of neoplasa, 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 & Adenoca, Fibroma & Fibrosarcoma, Lipoma and liposarcoma

## B. SYSTEMIC PATHOLOGY

22. Anaemias
    Iron Deficiency anaemia, Megaloblastic snaemia
23. Leukaemias
    Acute and chronic lekaemias, Diagnosis and clinical features
24. Diseases of Lymph nodes
    Hodgkin's disease, Non hodgkins lymphoma, Metastatic carcinoma
25. Diseases of oral cavity
    Lichen planus, Stomatitis, Leukoplakia, Squamous cell Carcinoma, Dental caries, Dentigerious cyst, Ameloblastoma
26. Diseases of salivary glands
    Normal Structure, Sialadenitis, Tumours
27. Common diseases of Bones
    Osteomyelitis, Metabolic bone diseases, Bone Tumours, Osteosarcoma, Osteocalstoma, Giant cell Tumour, Ewing's sarcoma, Fibrous dysplasia, Aneurysmal bone cyst

28. Haemorrhagic Disorders
    Coagulation cascade
    Coagulation Disorders
    Platelet function
    Platelet disorders

**PRACTICALS** **Teaching Hrs - 55**

Urine – Abnormal constitutients
- Sugar, Albumin, ketone bodies

Urine – Abnormal constituents
- Blood, bile salts, bile pigments

Haemoglobin (HB) estimation
Totasl WBC count
Differential WBC Count
Packed cell volume (PCV) Erythrocyte sedimentation Rate (ESR)
Bleeding Time & Clotting Time
histopathology
Tissue Procedding
Staining
Histopathology slides
- Acute appendicitis, Granulation, tissue, fatty liver

Histopathology slides
CVC lung, CVC liver, Kindeney amyloidosis
Histopathology slides
Tuberculosis, Actiomycosis, Rhinosporidiosis
Histopathology slides
Papilloma, Basal cell Ca, Sq cell Ca
Histopathology slides
Osteosarcoma, Osteoclastoma, fibrosarcoma
Histopathology slides
Malignant melanoma, Ameloblastoma, Adenoma
Histopathology slides
Mixed parotid tumour, metastatic
Carcinoma in lymph node

## List of Textbooks


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

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION 45 Marks**

1. Spotters

| | | |
|---|---|---|
| Haematology slide | - | 1 |
| Histopatology slide | - | 4 |
| Specimens | - | 4 |
| Insruments | - | 3 |
| | | 12Marks |

2. To examine give sample of urine for abnormal constituents - 12 marks

3. To do differential count on the given peripheral blood smear - 12 marks

4. To estimate haemoglobin percentage in the given sample of blood - 09 marks

Or

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

# MICROBIOLOGY

## GOALS

The goal of teaching Microbiology is to provide understanding of the natural history of infectious diseases in order to deal with the etiology, pathogenesis, pathogenicity, laboratory diagnosis, treatment, control and prevention of these infectious diseases.

## EDUCATIONAL OBJECTIVES

### (a) Knowledge

*The student at the end of one year should be able to: -*

I. State the etiology, pathogenesis and methods of laboratory diagnosis and apply that knowledge in the diagnosis, treatment, prevention and control of communicable diseases caused by microorganisms.
II. Understand commensal( Normal oral flora), opportunistic and pathogenic organisms of human body and describe host parasite relationship.
III. To know the source and modes of transmission of pathogenic and opportunistic micro-organisms.
IV. To choose appropriate sample for laboratory investigations required for clinical diagnosis and to apply the immunological techniques in lab diagnosis.

### (b) Skills

I. Plan and interpret laboratory investigations for diagnosis of infectious diseases and correlate the clinical manifestations with the etiological agent of head and neck area
II. Acquire knowledge of antimicrobial agents and use of antimicrobial sensitivity tests to select suitable antimicrobial agents for treatment.
III. Be conversant with proper methods of collection, storage & transport of clinical material for microbiological investigations.
IV. Understand the principles of immunology and its application in the diagnosis and prevention of infectious diseases including immunization schedule, acquire knowledge of the scope of immunotherapy and different vaccines available for the prevention of infectious diseases.
V. Understand methods of disinfection and sterilization and their application to control and prevent hospital and community acquired infections including universal biosafety precautions and waste disposal.
VI. The student should be well equipped with the knowledge of prevalent infectious diseases of national importance and of the newer emerging pathogens.

### (c) Attitude

i. The student will be regular, sincere, punctual and courteous and regular in studies.
ii. The student will follow all the rules laid down by the department and participate in all activities.
iii. The student will understand the importance of, and practice asepsis, waste segregation and appropriate disposal.
iv. The student will understand the importance of, and practice the best methods to prevent the development of infection in self and patient. (E.g. hand washing, using aprons for hospitals in hospitals only, regularly washing the aprons, wearing gloves (as and when required / handling specimens etc.).
v. The student will understand the use of the different antimicrobial agents including antibiotics to use judiciously and prevent misuse, (prescribing attitude).
vi. The student will wash his/her hands with soap after each practical class.

The student will leave the area allotted for his practical neat and tidy.

The student will discard the slides in the appropriate container provided for the same.

The student will report any injury sustained in class, immediately.
The student will report any breakage occurring during class times immediately.

The student may give suggestions to improve teacher student association.

### Sequential organization of contents and their division - Teaching Hrs - 65

The areas of study in Microbiology will include General Microbiology, Systemic Bacteriology, Immunology, Mycology, Virology, Parasitology and Applied microbiology.

## (A). GENERAL MICROBIOLOGY: (Total Hrs = 13)

| *No* | *Topic of lecture* | *Must know* | *Hrs* |
|---|---|---|---|
| 1 | Introduction and Historical background | Definitions: Medical Microbiology, pathogen, commensal, symbiont.<br>Scientists and their contributions in the field of Microbiology. Antony van Leeuwenhoek, Louis Pasteur, Joseph Lister, Robert Koch, Paul Ehrlich, Alexander Flemming. | 2 |
| 2 | Classification of micro-organisms and Morphology of bacteria | Microscopy: different types of microscopes and its uses. Difference between prokaryotes and Eukaryotes. Bacterial cell and its organelles, morphological classification, methods of studying bacteria, staining methods & their principles. | 2 |
| 3 | Physiology of bacteria including growth requirements & metabolism | Nutrition, respiration (anaerobic & aerobic) and growth of bacteria, growth curve, physical factors influencing growth. Culture media: Definition, classification and its application. Important culture media.<br>Methods of preservation of bacteria. | 2 |
| 4 | Sterilization and Disinfection | Definition of sterilization, disinfection, asepsis, antiseptics. Enumeration of physical and chemical methods of sterilization including principle & their application.<br>Testing of Disinfectants. Disinfection of Operation Theatre and skin. | 3 |
| 5 | Hospital Infection and waste Management | Overview of HAI and its importance. Definition of Biomedical waste, Categories, segregation, transport and disposal (including colour coding and types of container). | 1 |
| 6 | Bacterial genetics | Introduction to bacterial genetics, extrachromosal genetic elements, Mutation, transmission of genetic material, Transposable genetic elements.<br>Genetic mechanism of drug resistance. | 1 |
| 7 | Infection | Types of infections. Sources, mode of spread of infection. Bacterial virulence factors. Attenuation, Exhaltation. | 1 |
| 8 | Anaerobic Culture Media | Medias used and methods of anaerobic cultivation | 1 |

## (B). IMMUNOLOGY: (Total Hrs = 11)

| Sl. No. | Topic | Must know | Hrs |
|---|---|---|---|
| 1 | Immunity | Introduction, Definition and types of immunity, factors responsible, mechanism of innate and acquired immunity, Herd immunity and local immunity. | 1 |
| 2 | Antigens | Definition, determinants of antigenicity, properties of antigen, Haptens. | 1 |
| 3 | Antibodies | Introduction, structure of immunoglobulins, immunoglobulin classes, biosynthesis and metabolism of immunoglobins. Monoclonal antibodies. | 1 |
| 4 | Complement system | Definition, synthesis, pathways, activation, role & biological functions, components, measurement. Complement deficiency diseases. | 1 |
| 5 | Antigen and antibody reactions | Introduction, general features of antigen-antibody reactions, measurement of antigens and antibodies. Principle, types and application of precipitation and agglutination, complement dependent tests, enzyme immunoassay, radioimmunoassay, immunofluoroscence test. | 2 |
| 6 | Structure and functions of immune system | Introduction, central and peripheral lymphoid organs, cells of lymphoreticular system, T and B cell maturation, antigen presenting cells, MHC. | 1 |
| 7 | Immune response | Introduction, Humoral immunity, factors affecting antibody production, adjuvants, cell mediated immunity, cytokines and its clinical applications, theories of immune response. | 1 |
| 8 | Hypersensitivity | Definition, classification, difference between immediate and delayed reaction, type I (anaphylaxis, atopy), type II (cytolytoxic and cytolytic), type III (serum sickness, arthus reaction), type IV (cell mediated or delayed reaction). | 2 |
| 9 | Autoimmunity Transplantation | Definition, mechanism, classification and pathogenesis of autoimmune diseases.<br>Introduction, Types of transplants, mechanism of transplants, allograft rejection, clinical features and prevention of graft rejection, GVH reaction, | 1 |

## (C ). SYSTEMIC BACTERIOLOGY: (Total Hrs = 20)

**Must know about each Bacteria:** Introduction, species, morphology, cultural characteristics, biochemical reactions, antigenic structure, virulence factors, pathogenicity, clinical features, laboratory diagnosis, antibiotic sensitivity, treatment, prevention and control.

| Sl. No. | Topic | Must know | Hrs |
|---|---|---|---|
| 1 | Staphylococcus | Staphylococcus aureus, MRSA, Coagulase negative staphylococcus, | 1 |
| 2 | Streptococcus | Classification, Streptococcus pyogenes, Streptococcus pyogenes. Viridans streptococci | 2 |
| 3 | Neisseria & Str.pneumoniae | Neisseria gonorrhoeae, Neisseriae meiningitidis, Str.pneumoniae | 1 |
| 4 | Corynebacterium | Corynebacterium diphtheriae, other medically important corynebacterium species, Diphtheroids. | 2 |
| 5 | Bacillus | Bacillus anthracis, Anthracoid bacilli, Bacillus cereus. | 1 |
| 6 | Clostridium | Classification,<br>Clostridium perfringens,<br>Clostridium tetani,<br>Clostridium botulinum,<br>Clostridium difficile | 2 |
| 7 | Non sporing anaerobes | Anaerobic cocci and bacilli. | 1 |
| 8 | Mycobacterium | Classification, Mycobacterium tuberculosis, RNTCP, Atypical mycobacteria | 2 |
| 9 | Enterobacteriaceae | Classification,<br>Coliforms – Escherichia coli<br>Salmonella – gastroenteritis, enteric fever, septicaemia.<br>Shigella | 2 |
| 10 | Vibrionaceae and Pseudomonas, | Vibrio cholerae, Halophilic vibrios, Aeromonas,<br>Pseudomonas aeruginosa | 1 |
| 11 | Spirochataceae | Classification, Treponema pallidum, Leptospira, Borrelia | 2 |
| 12 | Actinomycetes | Actinomyces, Nocardia | 1 |
| 13 | Normal oral flora | Introduction, Host parasite.<br>Relationship -Commensal, Pathogens and Opportunists.<br>Classification - resident and transient flora.<br>Normal oral flora and its importance. | 1 |
| 14 | Oral Microbiology | Dental plaque, Dental caries & Periodontal diseases | 1 |

## (D). MYCOLOGY: (Total Hrs = 02)

| No | Topic | Must know | Hrs |
|---|---|---|---|
| 1 | Oral manifestation of Systemic mycosis Yeast and yeast like fungi | Histoplasmosis, Blastomycosis, Coccidioidomycosis, and Paracoccidioidomycosis. Candida and Cryptococcus Rhinosporidiosis | 1 |
| 2 | Opportunistic mycosis | Aspergillosis, Zygomycosis and Penicillium marneffei. | 1 |

## (E). VIROLOGY: (Total Hrs = 06)

Morphology, pathogenesis, laboratory diagnosis, prevention and control for all viruses (Must know).

| Sl. No. | Topic of lecture | Must know | Hrs |
|---|---|---|---|
| 1. | Introduction to Virology & Lab diagnosis of viral infections Pox viruses | Introduction, morphology and classification of viruses. Collection of samples, transport, cultivation and methods of diagnosis. Molluscum contagiosum. | 2 |
| 2. | Herpes viruses Paramyxoviruses | Classification, Herpes simplex, Varicella zoster, Measles virus, Mumps virus, | 1 |
| 3. | Picornaviruses | Classification, Polio virus | 1 |
| 4. | Rhabdoviruses Hepatitis viruses | Rabies Classification of Hepatitis viruses and Hepatitis B virus in detail. | 1 |
| 5. | Retroviruses | Human immunodeficiency virus. | 1 |

## F) PARASITOLOGY: (Total Hrs = 02)

| No | Topic of lecture | Must know | Desirable to know | Hrs |
|---|---|---|---|---|
| 1. | Introduction to medical Parasitology Protozoans | Introduction, history, classification, explanation of terminologies and laboratory diagnosis of parasitic infections by stool examination. Entamoeba histolytica, Malarial parasites and LD bodies. | | 1 |
| 2. | Helminthes | General characteristics and classification. Ascaris lumbricoides , Hook worms and Enterobius vermicularis. And Microfilaria | | 1 |

## G) APPLIED Microbiology (Total Hrs = 04)

| No | Topic of lecture | Hrs |
|---|---|---|
| 1 | Hospital acquired infections | 1 |
| 2 | Zoonotic diseases | 1 |
| 3 | Infections in immunocompromised individuals. | 1 |
| 4 | Vaccination and immunization schedule | 1 |

**PRACTICAL** **Teaching Hrs - 50**

| Sl. No. | Topic of Practicals | No. of Class |
|---|---|---|
| 1. | Introduction To microbiology Practicals | 1 |
| 2. | Microscopy | 1 |
| 3. | Instruments | 1 |
| 4. | Collection, transportation, storage and processing of Specimens in microbiology laboratory | 1 |
| 5. | Uninoculated Culture Media and Methods of inoculation. Aerobic and anaerobic medias | 1 |
| 6. | Revision of Instruments and culture media | 1 |
| 7. | Discussion of Staining techniques | 1 |
| 8. | Demonstation of Gram's Staining | 1 |
| 9. | Gram's Staining | 1 |
| 10. | Demonstration of Ziehl-Neelsen staining | 1 |
| 11. | ZN Staining | 1 |
| 12. | Demonstration of Hanging Drop and Albert's Staining | 1 |
| 13. | Revision of Gram's Staining | 1 |
| 14. | Revision of ZN staining | 1 |
| 15. | Inoculated madia and Antibiotic Sensitivity Testing | 1 |
| 16. | Spotters Slides of bacterial morphology. | 1 |
| 17. | Revision of Spotter slides and Culture media | 1 |
| 18. | Gram's Staining - Revision | 1 |
| 19. | ZN Staining - Revision | 1 |
| 20. | Mock test | 1 |
| 21. | Mock test | 1 |
| 22. | Internal Assessment Mock Test | 4 |

## SPOTTER LIST FOR II BDS

The following are the spotters:

| CULTURE MEDIA WITHOUT GROWTH |
|---|
| 1. Peptone Water |
| 2. Glucose Broth |
| 3. Nutrient Agar Plate |

| |
|---|
| 4. Blood Agar Plate |
| 5. Chocolate Agar Plate |
| 6. Mac Conkey's Agar Plate |
| 7. Lowenstein Jensen slope |
| 8. Robertson's Cooked Meat medium |
| 9. Milk Agar Plate |
| 10. Castaneda Blood Culture Medium |
| 11. Loeffler's Serum Slope |
| 12. Wilson and Blair Media |
| |
| **CULTURE MEDIA WITH GROWTH** |
| 1. Staphylococcus colonies on Nutrient Agar |
| 2. Staphylococcus colonies on Milk agar |
| 3. C. diphtheriae on TBA |
| 4. Mac Conkey Agar with LF and NLF |
| 5. Antibiotic Sensitivity Plate |
| 6. Blood Agar with ß – hemolytic Streptococci |
| 7. Milk agar with Staphylococci |

| |
|---|
| **BACTERIOLOGY SLIDES** |
| 1. Staphylococci |
| 2. Streptococci |
| 3. Gonococci |
| 4. Corynebacterium diphtheriae |
| 5. M. tuberculosis |
| 6. Bacillus anthracis |
| 7. Clostridium tetani |
| 8. Treponema pallidum |
| 9. Actinomycetes |
| 10. Gram negative bacilli |
| |
| **MYCOLOGY SLIDES** |
| 1. Candida |
| 2. Cryptococcus |
| 3. Rhinosporidium seeberi |

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|---|
| **INSTRUMENTS** |
| 1. Mc Intosh Flides Jar |
| 2. Seitz filter, candle filter and sintered glass filter |
| 3. Widal rack and tubes |
| 4. VDRL Slide |
| 5. Sterile Cotton Swab |
| 6. Tuberculin Syringe |
| 7. Sterile Disposable Syringe |
| 8. Inoculation Wire Loop |
| 9. Pasteur Pipette |
| 10. Microtitre Plate |
| 11. Surgical Gloves |

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION** **45 Marks**

| | |
|---|---|
| 1. Spotters | 15 marks |
| Five slides ( 5 x 2 marks) | 10 marks |
| Three media ( 3 x 1 marks) | 03 marks |
| Instruments ( 2 x 1 marks) | 02 marks |
| 2. Grams stain | 15 marks |
| 3. Ziehl –Neelsen's Stain | 15 marks |

**Suggested Books in Microbiology:**

1. Textbook of Microbiology by Ananthanarayan & Paniker
2. Textbook of Microbiology for Dental students by D R Arora
3. Textbook of Microbiology for Dental Students by C P Baveja
4. Textbook of Microbiology by chakraborthy
5. Textbook of Parasitology by D R Arora
6. Textbook of Parasitology by chatterjee
7. Text book of Mycology by Jagadish chander.

**Referencebooks:**

1. Manson-Barr, Manson's tropical diseases.
2. Mandell, principles and practice of infectious diseases.
3. Oral Microbiology-Author

# GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICS

**GOAL:**

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

**OBJECTIVES**

**a). Knowledge**

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

1. Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs in general and in dentistry in particular.
2. list the indications, contraindications; interactions, and adverse reactions of commonly used drugs with reason
3. Tailor the use of appropriate drugs in disease with consideration to its cost, efficacy, safety for individual and mass therapy needs.
4. Indicate special care in prescribing common and essential drugs in special medical situations such as pregnancy, lactation, old age, renal, hepatic damage and immuno compromised patients.
5. Integrate the rational drug therapy in clinical pharmacology.
6. 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.
5. INTEGRATION: Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical departments.

**THEORY** **Teaching Hrs – 70**

| | |
|---|---|
| **I. General Pharmacology :**<br>a) Definitions: Pharmacology, drug. Pharmacy, sources of drugs with examples. | 1 hour |
| b) Pharmacokinetics with clinical implications. | 2 hours |
| c) Routes of administration : oral, inhalation, intradermal, Subcutaneous, intramuscular, intravenous intrathecal, peritoneal & Newer drug regimes (Advantages and disadvantages with the examples of drugs administered). | 1 hour |
| d) Pharmacodynamics : mechanism of action, factors modifying drug actions with emphasis on factors like - age, sex, dose, frequency & route of administration, presence of other drugs, Pharmacogenetics andPathological conditions. | 2 hours |
| e) Therapeutics: Principles of drug therapy, Adverse drug reactions and drug interactions. | 3 hours |
| **2. ANS drugs** : Clinically used examples, their important pharmacological actions (which form the basis for the uses), clinical uses along with dental uses if any and specific adverse effects of-<br>a) Sympathomimetics<br>b) Sympatholytics - alpha blockers, Beta - blockers.<br>c) Cholinomimetics.<br>d) Anticholinergics. | <br><br><br>1 hour<br>2 hours<br>2 hours<br>2 hours |
| **3. Detailed pharmacology of:**<br>**A.** a). Clinically used opiod and non-opiod analgesics,<br>b). Clinically used local anesthetics. | <br>2 hours<br>2 hours |
| **B**. Enumeration of clinically used agents, their brief Pharmacology, clinical uses along with dental uses if any, and specific adverse effects of: a. Ethyl alcohol - actions, uses and drug interactions. | 1 hour |
| a) General anesthetics | 2 hours |
| b) Preanaesthetic medication. | |
| c) Antipsychotics, antidepressants, anxiolytics. | 2 hours |
| d) Sedative hypnotics | 2 hours |
| e) Antiepileptics | 1 hour |
| **4. CVS drugs :** Enumeration/Classification of clinically used agents their important pharmacological actions (that form the basis of their uses) Clinical uses along with dental uses if any, and specific adverse effects of : | |
| a) Cardiac glycosides | 1 hour |
| b) Antianginal drugs | 1 hour |
| c) Antihypertensives. | 1 hour |
| d) Diuretics | 1 hour |
| e) Pharmacotherapy of shocks - anaphylactic, cardiogenic hypovolemic & Septic, | 1 hour |
| **5. Drugs acting on blood :** Detailed pharmacology of: | |
| a) Coagulants, anticoagulants, fibrinolytics, anti platelet drugs and styptics | 3 hours |
| b) Hematinics : Iron preparation Vit.B12, Folic acid Vit.C | 3 hours |
| c) Vit.D and calcium preparations. | 1 hour |

| | |
|---|---|
| **6. Endocrines :** Enumeration/Classification of clinically used agents and their preparations, Mechanism of action, clinical uses along with dental uses if any and specific adverse effects of: | |
| a). Drugs used in diabetes mellitus | 2 hours |
| b). Corticosteroids. | 2 hours |
| **7. Chemotherapy :** Enumeration/Classification of clinically used Agents, their mechanism of action clinical uses along with dental uses if any and specific adverse effects of: | |
| a) Sulfonamides | 1 hour |
| b) Beta-lactum antibiotics | 2 hours |
| c) Macrolides and aminoglycosides | 1 hour |
| d) Broad spectrum antibiotics | 1 hour |
| e) Antifungal and antiviral (acyclovir) agents. | 2 hours |
| f) Metronidazole and fluoroquinolones | 1 hour |
| g) Antineoplastic Drugs: Alkylating agents, Antimetabolities, Radio active Isotopes, Vinka Alkaloids, Anti Cancerous antibiotics. | 2 hours |
| h) Drug Therapy of Tuberculosis, Leprosy & Malaria. | 3 hours |
| **8. Other drugs :** Enumeration of clinically used agents, general uses along with dental uses if any and specific adverse effects of: | |
| a) Antihistamines and antiemetics | 2 hours |
| b) Drugs used in bronchial asthma and cough | 1 hour |
| c) Drugs used in peptic ulcer | 2 hours |
| d) Chelating agents - BAL, EDTA & Penicillamine. | 1 hour |
| e) Antihelmenthics | 2 hours |
| **9. Dental Pharmacology** | |
| **A**. a)Fluoride pharmacology | 1 hour |
| b) Antiseptics, astringents & Sialogogues | 1 hour |
| c) Obtundents, Mummifying agents and disclosing agents. | 1 hour |
| **B**. Prevention and drug therapy of emergencies in dental practice. | 2 hours |
| 1. Seizures | |
| 2. Anaphylaxis | |
| 3. Severe bleeding | |
| 4. Shock | |
| 5. Tetany | |
| 6. Status asthmaticus | |
| 7. Acute addisonian crisis | |
| 8. Diabetic Ketoacidosis | |

**PRACTICALS** **TEACHING HRS- 20**

| | |
|---|---|
| 1) Introduction - equipments used in dispensing pharmacy, prescription -parts and model prescription. | 2 hours |
| 2) Demonstration of common dosage forms used in clinical practice. | 2 hours |
| 3) Mixtures - one example (Expectorant/Salicylate) of simple and diffusible (Bismuth Kaolin/chalk) mixtures. | 2 hours |
| 4) Emulsion - Types and example (Liniment turpentine/ Shark liver oil) of emulsion. | 2 hours |

| | |
|---|---|
| 5) Powders - tooth powder | 2 hours |
| 6) Mandl's paint/Gum paint percentage dilution - concept and calculations with suitable examples. | 2 hours |
| 7) Mouth washes - Alkaline, antiseptic, astringent. | 2 hours |
| 8) Tooth pastes | 2 hours |
| 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 anaemia. | 2 hours |
| 10) 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. | 2 hours |

**TEXT BOOKS RECOMMENDED:**

| Name of the Book | Author | Edn | Yr. of Publ. | Place of Publ. Publ.'s Name | Price |
|---|---|---|---|---|---|
| 1. R.S.Satoskar and S.D.Bhandarkar | Pharmacology and Pharmacotherapeutics | 16th | 1993 | Bombay Popular Prakashan | Rs. 375/- |
| 2. Tripathi K..D. | Essentials of MedicalPharmacology | 4th | 1994 | New Delhi Jaypee Brothers Medical Publishers | Rs. 400/- |
| 3. Laurence D.R. | Clinical Pharmacology | 8th | 1997 | New York Churchill Livingston | £ 11.00 |
| 2. Kartzung Betram G. | Basic and clinical Pharmacology | 8th | 2001 | USA , Lange Medical Books | S 30.00 |
| 3. Seymour Robin A | Pharmacology and DentalTherapeutics | 3rd | 1999 | New York OxfordUniversity Press | Rs. 1495/- |
| 6. Cawson R.A. | ClinicalPharmacology in Dentistry | 5th | 1989 | New York Churchill Livingstone | £ 17.50 |

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION 90 Marks**

1. Spotters : 10 nos. X 1 = 10 marks
2. Prescriptions : 2 nos.(8+8marks ) =16 marks
   (one medical plus one dental prescription)
3. Preparations : 2 nos. X 32 each = 64 marks
   (one medical plus one dental preparation)

# DENTAL MATERIALS

## GOALS & OBJECTIVES

**At the end of the second year, the student should be**

- Understand the uses, physical, mechanical, chemical composition, and biological properties of the materials.
- Be able to manipulate the material in the appropriate way thus enhancing the properties of the material.
- Understanding the advantage and disadvantage of individual dental material and their right application.

## COURSE CONTENTS

**THEORY CLASSES DURING FIRST YEAR** **Teaching Hrs- 20**

| NO | TOPIC | IMPORTANCE | HOURS |
|---|---|---|---|
| 1 | **Introduction –** **Aims:** Aim of the course is to present basic chemical and physical properties of dental materials as they are related to its manipulations 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. | **Must know** | **1 hour** |
| 2 | **Objectives:** To understand the evolution and development of science of dental materials. 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 ordinating factors into the desired Ernest. Laying down standards or specifications of various materials to guide to manufacturers as well as to help professionals. search for newer and better materials which may answer our requirements with greater satisfaction . To understand and evaluate the claims made by manufacturers of dental material. | **Must know** | **1 hour** |
| 3 | **NEED FOR THE COURSE** The profession has to rise from an art to science, the need for the dentist to posses adequate knowledge of materials to exercise his best through knowledge of properties of different types of | **Must know** | **1 hour** |

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|---|---|---|---|
| | materials. The growing concern of health hazards of mercury toxicity, inhalation of certain vapopur or dust materials, irritations and allergic reaction to skin due to contact of materials. Materials causing irritation of oral tissues, ph of restorative material causing inflammation and necrosis of pulp which is a cause for burning for the dentist to posses wider knowledge of physical , chemical and biological properties of material being used . For the protection for the patient and his own protection certain criteria's of selection are provided that will enable the dentist to discriminate between facts and propaganda, which will make a material biologically acceptable**.** | | |
| **4** | **SCOPE:**<br>The dental materials are employed in mechanical procedures including restorative dentistry such as Prosthodontics, endodontics, periodontal, orthodontics and restorative materials. There is scarcely a dental procedure that does not make use of dental materials in one form or another and therefore the application of dental material is not limited to any one branch of dentistry. Branches such as minor surgery and Periodontics require less use of materials but the physical and chemical characters of materials are important in these fields.<br>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 1 sq. mm of tooth or restorative materials can reach to a level as high as many kilograms. Thus the biological properties of dental materials cannot be separated from their physical and chemical properties. | **Must know** | **1 hour** |
| **5** | **Structure of matter and principles of adhesion**<br>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 | **Must know** | **2 hours** |
| **6** | **Physical and Mechanical properties of dental materials**<br>Physical properties are based on laws of mechanics, acoustics, optics, thermodynamics, | **Must know** | **3 hours** |

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| | electricity, magnetism, radiation, atomic structure or nuclear phenomena. Hue, value, chroma and translucency physical properties based on laws of optics, dealing with phenomena of light, vision and sight. Thermal conductivity & coefficient of thermal expansion are physical properties based on laws of thermodynamics. Stress, strain, proportional limit, elastic limit yield strength, modulus of elasticity, flexibility, resilience, impact, impact strength, permanent deformation, strength, flexure strength fatigue, static fatigue, toughness, brittleness, ductility & malleability, hardness, abrasion resistance, relaxation, rheology, Thixotropic, creep, static creep, dynamic creep, flow, color, three dimensional color — hue, values, chroma, Munsell system, metamersim, fluorescence, physical properties of tooth, stress during mastication | | |
| **7** | **Gypsum and gypsum products**<br>Gypsum — is origin, chemical formula, Products manufactured from gypsum.<br>Dental plaster, Dental stone, Die stone, high strength, high expansion stone. Application and manufacturing procedure of each, macroscopic and microscopic structure of each. Supplied as and Commercial names.<br>Chemistry of setting, setting reaction, theories of setting, gauging water, Microscopic<br>Structure of set material.<br>Setting time: working time and setting time, Measurement of setting time and factors<br>Controlling setting time<br>Setting expansion, Hygroscopic setting expansion — factors affecting each<br>Strength wet strength, dry strength, factors affecting strength, tensile strength<br>Slurry — need and use.<br>Care of cast.<br>ADA classification of gypsum products<br>Description of impression plaster and dental investment<br>Manipulation including recent methods or advanced methods.<br>Disinfection : infection control, liquids, sprays, radiation<br>Method of use of disinfectants<br>Storage of material — shelf life | **Must know** | **1 Hours** |
| **8** | **Impression materials**<br>Impression plaster, Impression compound, Zinc oxide eugenol impression paste & bite registration paste., incl., non eugenol paste, Hydrocolloids, | **Must know** | **1 hours** |

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| | reversible and irreversible, Elastomeric impression materials. Polysulphide, Condensation silicones, Addition silicones, Polyether, Visible light cure polyether urethane dimethacrylate, Historical background & development of each impression material, Definition of impression , Purpose of making impression, Ideal properties required and application of material, Classification as per ADA specification, general & individual impression material.<br>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 mci., electroplating Biological properties: tissue reaction , Shelf life & storage of material, Infection control — disinfection, Advantages & disadvantages of each material. | | |
| **9** | **Dental waxes**<br>Introduction and importance of waxes. sources of natural waxes and their chemical nature<br>Classification of waxes: Properties: melting range, thermal expansion, mechanical properties, flow and residual stresses, ductility. Dental wax: inlay wax: mode of supply: classification & composition, ideal Requirements: properties of inlay wax: flow, thermal properties wax distortion and its causes.<br>Manipulation of inlay wax: instruments & equipment required, including electrically heated instrumental metal tips and thermostatically controlled wax baths. Other waxes: application mode of supply & properties. Casting wax base plate wax, processing wax, boxing wax, utility wax, sticky wax, impression wax for corrective impressions, bite registration wax. | **Must know** | **1 hours** |
| **10** | **Synthetic resins used in dentistry**<br>Historical background and development of material, Denture base materials and their classification and requirement<br>Classification of resins<br>Dental resins — requirements of dental resins, | **Must know** | **4 hours** |

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| | applications, polymerization, polymerization mechanism stages in addition polymerization, inhibition of polymerization, co polymerization, molecular weight, cross linking, plasticizers, Physical properties of polymers, polymer structures types of resins.<br>ACRYLIC RESINS:<br>Mode of polymerization: Heat activated, Chemically activated, Light activated, Mode of supply, application, composition, polymerization reaction of each. Technical considerations: Methods of manipulation for each type of resin. Physical properties of denture base resin. Miscellaneous resins;!& techniques: Repair resins, Relining and rebasing. Short term and long-term soft-liner,, temporary crown and bridge resins, Resin impression trays, Tray materials, Resin teeth, materials in maxillofacial prosthesis, Denture cleansers, Infection control in detail, Biological properties and allergic reactions. | | |
| **11** | **Dental cements – Definition, ideal requirements,** classification<br>Definition & Ideal requirements:<br>Cements: Silicate, Glass ionomer, metal modified glass ionomer, resin modified glass ionorner, zinc oxide eugenol, modified zinc oxide eugenol, zinc phosphate, zinc silico phosphate, zinc poly carboxylate, Cavity liners and cement bases, Varnishes Calcium hydroxide, Gutta percha<br>Application, classification (general and individual ), setting mechanism, mode of supply, Properties, factors affecting setting, special emphasis on critical procedures of manipulation and protection of cement, mode of adhesion, biomechansim of caries inhibition.<br>Agents for pulpal protection. Modifications and recent advances, Principles of cementation. Special emphasis on cavity liners and cement bases and luting agents. | **Must know** | **4 hours** |

**THEORY CLASSES DURING SECOND YEAR** **Teaching Hrs - 60**

| NO. | TOPIC | IMPORTANCE | HOURS |
|---|---|---|---|
| **1.** | **METAL AND METAL ALLOYS:**<br>structure and behavior of metals, solidification of metals, mechanism of crystallisation amorphous and crystalline. Classification of alloys, solid solution, constitutes or equilibrium phase diagrams, physical properties, solid state reaction, other binary systems : metallography and heat treatment. | **Must know** | **3 hours** |

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| | **TARNISH AND CORROSION:**<br>Definition, causes, protection against corrosion of dental restorations, clinical significance of galvanic current. | | |
| **2** | **Wrought base metal alloys:**<br>Applications and different alloys used mainly for orthodontics purpose,<br>- Stainless Steel<br>- Cobalt Chromium Nickel<br>- Nickel Titanium<br>- Beta Titanium<br>Properties required for orthodontic wires, working range, springiness, stiffness, resilience, formability, ductility, ease of joining, corrosion resistance, stability in oral environment, biocompatibility.<br>Stainless steel: description, type, composition and properties of each type. Sensitization & stabilization, mechanical properties – strength, tensile, yield strength, KHN, braided &twisted wires their need, solders for stainless steel, fluxes, welding.<br>1. Wrought cobalt chromium nickel alloys, composition, allocation, properties, hat treatment, and physical properties.<br>2. Nickel – titanium alloys, shape, memory and super elastic<br>3. Titanium alloys, application, composition, properties, welding, corrosion resistance. | **Must know** | **4 hours** |
| **3** | **DENTAL CASTING ALLOYS:**<br>Historical background, desirable properties of casting alloys.<br>Alternatives to cast metal technology: direct filling gold, amalgam, mercury free condensable intermetallic compound - an alternative to metal casting process. CAD-CAM process for metal & ceramic inlays - without need for impression of teeth or casting procedure, pure titanium, most bio compatible. Metal which are difficult to cast can be made into crowns with the aid of CAD- CAM technology. Another method of making copings - by copy milling (without casting procedures).<br>Classification of casting alloys: By function & description.<br>Recent classification, High noble (HN), Noble (N) and predominantly base metal (PB) Alloys for crown & bridge, metal ceramic & removable partial denture. Composition, function, constituents and application, each alloy both noble and base metal. Properties of alloys: Melting range, mechanical properties, hardness, and elongation, modulus of | **Must know** | **6 hours** |

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| | elasticity, tarnish and corrosion.<br>Casting shrinkage and compensation of casting shrinkage. Biocompatibility - Handling hazards & precautions base metal alloys, casting investments used. Heat treatment :<br>Softening & hardening heat treatment. Recycling of metals. Titanium alloys & their application, properties & advantages. Technical considerations In casting. Heat source, furnaces. | | |
| **4.** | **Dental casting and investments:**<br>Definition, requirements, classification.<br>Gypsum bonded – classification, phosphate bonded, silica bonded.<br>Expansions: setting, hygroscopic setting expansion and thermal expansion.<br>Factors affecting. Properties: strength, porosity, and finess, and storage. Technical considerations: for casting procedure, preparation of die, wax pattern, spruing, investing, control of shrinkage compensation, wax burnout and heating the invested ring, casting.<br>Casting machines, source of heat of melting alloys. Defects in casting. | **Must know** | **7 hours** |
| **5.** | **Dental ceramics:**<br>Historical background & general applications.<br>Dental ceramics: definition, classification, application, mode of supply, manufacturing procedure, methods of strengthening. Properties of fused ceramic: strength and factors affecting, modulus of elasticity, surface hardness, wear resistance, thermal properties, specific gravity, chemical stability, esthetic properties, biocompatibility, technical considerations.<br>Metal ceramics: alloys – types and composition of alloys. Ceramic – type and composition.<br>Metal ceramic bond – nature bond. Bonding using electro deposition, foil copings, bonded platinum foil, swaged gold alloy foil coping. Technical considerations for porcelain and porcelain fused metal restorations. Recent advances - all porcelain restorations, Manganese core, injection moulded, castable ceramics, glass infiltrated alumina core ceramic (In ceram), ceramic veneers, inlays and onlays, and CAD CAM ceramic. Chemical attack of ceramic by fluoride. Porcelain furnaces. | **Must know** | **8 hours** |
| **6.** | **Die and die materials including electroforming and electro polishing:**<br>Types – gypsum products, electroforming, epoxy resin, amalgam. | **Must know** | **2 hours** |

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| **7.** | **Dental implants:**<br>Evolution of dental implants, types and materials. | **Must know** | **2 hours** |
| **8.** | **Mechanics of cutting :**<br>Burs & points | **Must know** | **2 hours** |
| **9.** | **Dental amalgam alloys:**<br>History:<br>Definition of dental amalgam, application, Alloy classification, manufacture of alloy powder composition - available as.<br>Amalgamation: setting reaction & resulting structure , properties , Micro leakage Dimensional stability, Strength, Creep, Clinical performance<br>Manipulation: Selection of alloy, proportioning, mechanism of Trituration, condensation,<br>Carving & finishing. Effect of dimensional changes, Marginal deterioration., Repair of<br>Amalgam, mercury toxicity, mercury hygiene. | **Must know** | **7 hours** |
| **10.** | **Direct filling gold:**<br>Properties of pure gold, mode of adhesion of gold for restoration forms of direct filling gold for using as restorative material<br>Classification: Gold Foil, Electrolytic precipitate, powdered gold.<br>Manipulation: Removal of surface impurities and compaction of direct filling gold.<br>Physical properties of compacted gold, Clinical performance. | **Must know** | **3 hours** |
| **11.** | **Abrasive and polishing agents:**<br>Definition of abrasion and polishing. Need of abrasion and polishing. Types of abrasives:<br>Finishing, polishing & cleaning. Types of abrasives: Diamond, Emery, aluminum oxides garnet, pumice, kieselgurh, tripoli, rouge, tin oxide, chalk, chromic oxide, sand, carbides, diamond, zirconium silicate, Zinc oxide<br>ABRASIVE ACTION:<br>Desirable characteristics of an abrasive, Rate of abrasion, Size of particle, pressure and speed. | **Must know** | **5 hours** |
| **12.** | **RESTORATIVE RESINS:**<br>Historical background, Resin based restorative materials, Unfilled & filled, Composite restorative materials, Mode of supply, Composition, Polymerization mechanisms: Chemically activated, Light activated, Dual cure: Degree of conversion, Polymerization shrinkage Classification of Composites: Application, composition and properties of each Composite of posterior teeth, Prosthodontics resins for veneering. | | **6** |

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| | Biocornpatibility — pulpal reaction, pulpal protection Manipulation of composites: Techniques of insertion of Chemically activated, light activated, dual cure Polymerization, Finishing and polishing of restoration, Repair of composites Direct bonding Bonding: Need for bonding, Acid - etch technique, Enamel bonding, Dentin bonding agents. Mode of bonding, Bond strength, Sandwich technique its indication and procedure. Extended application for composites: Resins for restoring eroded teeth, Pit and fissure sealing, Resin inlay system — Indirect & direct, Core build up, Orthodontic applications. | | |
| **13.** | **SOLDERING, BRAZING AND WELDING**<br>Need of joining dental appliances, Terms & Definition<br>Solders: Definition, ideal requirement, types of solders — Soft & hard and their fusion temperature, application. Mode of supply of solders, Composition and selection, Properties.<br>Tarnish & corrosion resistance mechanical properties, microstructure of soldered joint. Fluxes & Anti fluxes: Definition, Function, Types, commonly used fluxes & their selection Technique of Soldering & Brazing: free hand soldering and investment, steps and procedure. Welding: Definition, application, requirements, procedure, weld decay - causes and how to avoid it. Laser welding. | | **3** |
| **14.** | **Biological considerations in use of dental materials:**<br>Materials used are with the knowledge of appreciation of certain biological considerations for use in oral cavity. Requirement of materials with biological compatibility. Classification of materials from perspective of biological compatibility. eg. Contact with soft tissues, affecting vitality of/pulp, used for root canal fillings, affecting hard tissues of teeth, laboratory materials that could accidentally be inhaled or ingested during handling. Hazards associated with materials: pH effecting pulp, polymers causing chemical irritation, mercury toxicity, etc. Micro leakage, Thermal changes, Galvanism, toxic effect of materials. Biological evaluation for systemic toxicity, skin irritation, mutagenecity and carcinogenicity. Disinfection of dental materials for infection control. | **Must know** | **2 hours** |

## PRACTICAL EXERCISES DURING FIRST YEAR Teaching Hrs- 40

### MUST KNOW AND DOING EXERCISES:-

1. Introduction
2. Manipulation of dental plaster
3. Manipulation of die stone exercise
4. Preparation of cube using dental plaster (2)
5. Manipulation of dental stone plaster
6. Preparation of cube using dental stone (2)
7. Rectangular blocks using dental plaster (2)
8. Rectangular blocks using dental stone (2)
9. Preparation of cone using dental plaster
10. Manipulation of impression compound
11. Thumb impression using impression compound (2)
12. Manipulation of elastomeric impression material exercise
13. Pouring of thumb impression with dental plaster and recovery of cast with base (2)
14. Adaptation of shellac base plate on thumb cast (2)
15. Mixing of zinc oxide eugenol cement
16. Mixing of Zinc phosphate cement
17. Mixing of Poly-carboxylate cement

## PRACTICAL EXERCISES DURING SECOND YEAR Teaching Hrs 200

### MUST KNOW AND DOING EXERCISES:-

- Manipulation of zinc oxide eugenol impression paste
- Final impression using zinc oxide eugenol impression paste (2)
- Pouring of zinc oxide eugenol impression with dental stone (2)
- Manipulation of irreversible hydrocolloid impression material
- Thumb impression using irreversible hydrocolloid impression material (2)
- Pouring of alginate thumb impression using dental plaster (2)
- Manipulation of modeling wax
- Preparation of cubes using modeling wax (2)
- Preparation of rectangular blocks using modeling wax (2)
- Manipulation of heat cure and auto polymerizing acrylic denture base resins
- Acrylization of wax blocks by using heat cure denture base resins (4)
- Finishing and polishing of acrylic blocks
- Mixing of GIC
- Trituration of silver amalgam and condensation into the cavity prepared in extracted natural / Typhodont tooth.

### DESIRABLE TO KNOW

- Significance of Trituration
- Steps in casting procedure – Must know
- Manipulation of materials under various condition
- Hygroscopic expansion
- Practical exercise for mixing investment material
- Properties of alginate material after impression making
- Practical demonstration of refractory cast
- Preparation of different cast ( Study cast, diagnostic cast, primary cast, secondary cast, check cast)

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION** **90 Marks**

| | |
|---|---|
| Major exercise | 2X 15 = 30 marks |
| Minor exercise | 2X 10 = 20 marks |
| Spotters | 20 X 2 = 40 marks |

1. Spotters : Identify and write the composition / uses
   Spotters : 20 x 2 marks each = 40 Marks
2. Major Exercise No.01 : (Prosthodontics ) : 1x15 Marks
3. Major Exercise No.02 : (Conservative) : 1x15 Marks
4. Minor Exercise No.03 : (Prosthodontics ) : 1x10 Marks
5. Minor Exercise No.04 : (Conservative) : 1x10 Marks
   **Total: 90 Marks**

1. **Major exercise : Any one exercise of the following : (Prosthodontics)**
   1. Manipulation of impression compound and preparation of impression using an edentulous model and pouring cast of either U/L arch.
   2. Manipulation of alginate hydrocolloid impression material and preparation of impression using an dentulous model and pouring cast of either U/L arch.

2. **Major exercise : Any one exercise of the following : (Conservative Dentistry)**
   1. Manipulation of ZOE cement ( Luting and filling consistency)
   2. Manipulation of Zinc phosphate cement (Luting and base consistency)
   3. Manipulation of Glass ionomer cement (Luting and filling consistency)
   4. Manipulation of Polycarboxy cement (Luting consistency)

3. **Minor exercise : (Prosthodontics)**
   1. Mixing of heat cure acrylic resins and justifying of time for all stages
   2. Manipulation of zinc oxide eugenol impression paste
   3. Manipulation of rubber base impression materials

4. **Minor exercise : (Conservative Dentistry)**
   1. Trituration of silver amalgam and condensation into the cavity prepared in extracted natural / Typhodont tooth.

**LEARNING SOURCES FOR STUDENTS**

- Text books
- Reference books
- Practical demonstrations
- Internet sources
- Patients

## SUGGESTIVE REFERENCES


- Phillips science of dental materials by Kenneth Anusavice
- Clinical aspects of dental materials by Marcia Gladwin and Michael Bagby
- Introduction to dental materials by Richard Van Noort
- Applied dental materials by John F. McCabe and Angus W.G.Walls
- Dental materials and their selection By William J O' Brien
- Restorative dental materials by Robert G. Craig
- Notes on dental materials by E.C. Combe

# PRE-CLINICAL PROSTHODONTICS

## GOALS & OBJECTIVES

**At the end of the second year, the student should be skillful & brave enough to**

- Understand the basic steps in fabricating a complete denture
- To know the anatomical variations and alterations for arrangement of teeth in various ridge relations
- To know the basic steps in preparation of tooth to receive various restorations on plaster models.
- To know the parts of cast partial denture.
- Understand the basic steps in fabricating a removable of Prosthodontics.
- To know the basic parts of a dental chair

## COURSE CONTENTS

### Practical Exercises During First Year — Teaching Hrs -100

**MUST KNOW AND DOING EXERCISES:-**

- Knowing the anatomical landmarks, marking on the models
- Preparation of the impression with impression compound using metallic models
- Pouring of impression, brief description of beading & boxing
- Making of special trays with various materials with various spacer design
- Preparation of master models
- Preparation of temporary & permanent denture bases
- Preparation of occlusal rims
- Orientation of occlusion rims on articulator
- Arrangement of teeth
- Processing of complete dentures

**Theory Classes During First and Second Year** **Teaching Hrs- 25**

| NO. | TOPIC | IMPORTANCE | HOURS |
|---|---|---|---|
| 1. | Introduction To Prosthodontics, scope & definition. | Must know | 1 hour |
| 2. | Maxillary & mandibular anatomical landmarks | Must know | 1 hour |
| 3. | Muscles of mastication | Must know | 1 hour |
| 4. | Brief anatomy of TMJ & its movements | Must know | 1 hour |
| 5. | Branches, scope & limitations of Prosthodontics | Must know | 1 hour |
| 6. | With teeth/without teeth, need to replace lost teeth | Must know | 1 hour |
| 7. | Types of prosthesis and requirements | Must know | 1 hour |
| 8. | Various surfaces and components of complete denture prosthesis | Must know | 1 hour |
| 9. | Steps in fabrication of prosthesis | Must know | 1 hour |
| 10. | Impression procedure for complete denture. – requirements, objective, theories and technique | Must know | 1 hour |
| 11. | Impression trays- definition, classification, materials, selection, spacer design. | Must know | 1 hour |
| 12. | Denture bases & occlusal rims | Must know | 1 hour |
| 13. | Articulators- classification, parts, advantages & disadvantages | Must know | 1 hour |
| 14. | Arrangement of teeth | Must know | 1 hour |
| 15. | Occlusion- balanced occlusion, other types | Must know | 1 hour |
| 16. | Trial dentures, try-in procedure | Must know | 1 hour |
| 17. | Laboratory procedures;<br>- Wax contouring<br>- Investing of dentures<br>- Preparing mold<br>- Preparing & packing acylic resin<br>- Processing of dentures<br>- Recovery of dentures<br>- Lab remount procedures<br>- Recovery the complete dentures from the cast<br>- Finishing and polishing the complete denture<br>- Palster cast for clinical denture remount procedure. | Must know | 1 hour |
| 18. | Related definitions & terminologies in removable prosthodontics | Must know | 1 hour |
| 19. | Removable partial denture, classification | Must know | 1 hour |
| 20. | Components of cast partial denture | Must know | 1 hour |
| 21. | Laboratory procedures for cast partial dentures | Must know | 1 hour |

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| 22. | Introduction - Fixed partial denture, components | Must know | 1 hour |
| 23. | Fixed partial denture- principles & retainers | Desirable to know | 1 hour |
| 24. | Laboratory procedures for fixed partial dentures | Desirable to know | 1 hour |
| 25. | Introduction to implant dentistry | Desirable to know | 1 hour |

**Practical Exercises During Second Year** **Teaching Hrs - 200**

**MUST KNOW**

Arrangement of artificial teeth on mounted Articulator. --- Minimum of 15 arrangements.

- Arrangement of teeth in different relations
- Identifying the spotters explaining the entities
- Importance of various prosthesis
- Basic parts of dental chair
- Basic positions of Dental chair
- Position of the operator and patient
- Basic steps in fabrication of removable partial denture
- Modification of teeth
- Repair of removable partial denture
- Repair of complete denture
- Relining of complete denture

**DESIRABLE TO KNOW**

- Surveying of partially edentulous models and preparing modified master casts
- Preparing wax patterns, spruing, casting and finishing
- Preparations of plaster models of various preparation of teeth to receive retainers for FPD
- Prepare wax pattern for individual crowns and investing, casting and porcelain facing.
- To know the parts of implants

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION 60 Marks**

- Duration – 3 hours
- Exercise 1– Arrangement of teeth in class I relation, waxing, Carving and polishing. - **- 50 marks**
- Exercise 2 – Spotters discussion - - **10 marks**

**LEARNING SOURCES FOR STUDENTS**

- Text books
- Reference books
- Practical demonstrations
- Internet sources
- Patients

## SUGGESTIVE REFERENCES


- Text book of complete dentures by Boucher
- Text of complete dentures by Heartwell
- Text book of complete dentures by Winkler
- Text book of removable partial dentures by Maccrackens
- Text book of fixed partial dentures by Rosenstiel
- Laboratory procedures in complete dentures by Rudd and morrow
- Laboratory procedures in removable partial dentures by Rudd and morrow
- Laboratory procedures in fixed partial dentures by Rudd and morrow
- Biological considerations in making impressions by Bernard Levin
- Phillips science of dental materials by Kenneth Anusavice

# PRE-CLINICAL CONSERVATIVE DENTISTRY

## GOALS & OBJECTIVES

At the end of the second year, the student should

- Have thorough knowledge of physical, chemical and biological properties of dental restorative materials.
- Develop the skills to manipulate the dental restorative materials, understanding their clinical significance and applications.
- Understand the principles in cavity design for various restorative materials.
- Develop the skills to prepare the cavities and restorative techniques on the plaster models, typhodont teeth and natural extracted teeth mounted in a phantom head simulative of patient.
- Acquire thorough knowledge of the hand and rotary cutting instrumentation used for restorative and endodontic procedures.

## COURSE CONTENTS (THEORY CLASSES) Teaching Hrs - 25

| SL NO. | TOPIC | HOURS |
|---|---|---|
| 1 | Introduction To Conservative dentistry scope & definition. | 1 hour |
| 2 | Definition, aim and scope of Conservative dentistry & Endodontics | 1 hour |
| 3 | Classification of cavities | 1 hour |
| 4 | Nomenclature | 1 hour |
| 5 | Various chair side positions | 1 hour |
| 6 | Tooth numbering | 1 hour |
| 7 | Restoration – Definition & Objectives | 1 hour |
| 8 | Instruments – Classification, nomenclature, design, formula of hand cutting instruments, care, grasps and rests. | 2 hour |
| 9 | Rotary cutting instruments – Burs, design and use. Various speeds in cavity preparation. | 2 hour |
| 10 | Principles of cavity / tooth preparation for:<br>a. Silver amalgam<br>b. Cast gold inlay<br>c. Composite resins<br>d. Glass ionomer | <br>2 hour<br>2 hour<br>2 hour<br>2 hour |
| 11 | Matrices, Retainers, Wedges | 2 hour |
| 12 | Separators – Different methods of separation | 1 hour |
| 13 | Finishing and polishing of restorations | 1 hour |
| 14 | Management of deep carious lesions – Pulp capping & Pulpotomy | 1 hour |
| 15 | Access cavity and brief introduction of root canal instruments. | 1 hour |

**PRACTICAL CLASSES** **Teaching Hrs - 200**

Exercises on plaster models

Class I cavity preparation

Conventional preparation on mandibular first molar

Conventional preparation on maxillary first molar

Conservative preparation on mandibular first molar.

Conservative preparation on maxillary first molar.

Conventional preparation on maxillary premolar

Conventional preparation on mandibular premolar

Class II cavity preparation

Conventional preparation (MO) on mandibular first molar.

Conservative preparation (DO) on mandibular first molar.

Conventional preparation (MO) on maxillary first molar.

Conservative preparation (DO) on maxillary first molar

MOD on maxillary first molar

MOD on mandibular first molar.

Class III cavity preparation

Class IV cavity preparation

Class V cavity preparation

Class VI cavity preparation

**Exercises on Typhodont**

1. Class I conventional cavity preparation & Silver amalgam restoration for – 14, 25, 27, 34, 36, 45 & 47.
2. Class I conservative cavity preparation & Silver amalgam restoration for - 16
3. Class I with palatal extension cavity preparation & Silver amalgam restoration for – 26.
4. Class I with buccal extension cavity preparation & Silver amalgam restoration for – 46.
5. Class II (MO) conventional cavity preparation & Silver amalgam restoration for – 24, 25, 26, 27, 44, 45, 46, and 47.
6. Class II (DO) conventional cavity preparation & Silver amalgam restoration for – 14, 15, 16, 17, 34, 35, 36, and 37.
7. Class II (MO) conservative cavity preparation & Silver amalgam restoration for – 16, 26, 36, and 46.
8. Class II (MOD) cavity preparation & Silver amalgam restoration for –26 and 46.
9. Class III cavity preparation for – 11, 23, 31, and 42.
10. Class IV cavity preparation for – 12 and 21.

11. Class V cavity preparation for – 13, 16, 22, and 36.
12. Class VI cavity preparation for – 17 and 37.
13. Class I inlay cavity preparation for – 36 and wax pattern
14. Class II inlay cavity preparation for – 15 and 46.
15. Pulp capping on extracted teeth.
16. Pulpotomy on extracted teeth.
17. Root canal access cavity preparation & working length determination on extracted maxillary central incisors & lateral incisors.

## DEMONSTRATIONS

- Class – I, II, III, IV, V and VI Cavity preparations on plaster models.
- Class – I cavity preparation and silver amalgam restoration on typhodont teeth.
- Class II & V – Amalgam restoration.
- Class III & IV – GIC & Composite restoration.
- Pulp capping and pulpotomy on extracted teeth.
- Class – I and II inlay cavity preparation and wax pattern fabrication.
- Casting procedure
- Access cavity preparation and working length determination on anterior teeth.

## DISCUSSIONS

1. Classification of cavities and Nomenclature
2. Principles of cavity preparation.
3. Chair side positions.
4. Arrangements of instruments.
5. Matrix band.
6. Wedges.
7. Separators.
8. Liners.
9. Bases.

## ASSIGNMENTS

1. Aim and Scope of conservative dentistry and endodontics
2. Draw the cross section of tooth and label.
3. Tooth numbering systems.
4. Classification of cavities.
5. Nomenclature of cavities.
6. Fundamental principles of cavity preparation.
7. Class I and Class II cavity preparations for silver amalgam and restorative techniques.
8. Classification of instruments in restorative dentistry.

## CLINICAL / PRACTICALUNIVERSITY EXAMINATION 60 Marks

- Spotters – 10 (Identification each spotter carries one mark)
- Class II cavity preparation and restoration with silver amalgam on any first molar tooth.
  Cavity preparation – 20 marks
  Base and Matrix application – 10 marks
  Restoration – 20 marks

## LEARNING SOURCES FOR STUDENTS

- Text books
- Reference books
- Practical demonstrations
- Internet sources

## SUGGESTIVE REFERENCES


- Science of dental materials, 11th Ed.by Anusavice
- Sturdevant's Art and Science of Operative Dentistry, 5th Ed.
- Operative Dentistry (Modern theory and Practice) M.A. Marzouk, A.C.Simonton, R.D.Gross . 1st Ed.
- Principoles and Practice of Operative Dentistry, 3rd Ed, by T Charbaeau.
- Endodontic practice 11th Ed, Grossman.

# GENERAL MEDICINE

## GUIDELINES

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

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

**Theory Syllabus** **Teaching Hrs - 60**

| Core Topics (Must Know) | Collateral Topics (Desirable to Know |
|---|---|
| 1. Aims of medicine Definitions of signs, symptoms, diagnosis, differential diagnosis treatment & prognosis. | |
| **2. Infections.** Enteric fever, AIDS, herpes simplex, herpes, zoster, syphilis diphtheria. | Infectious mononucleosis mumps, measles, rubella, malaria |
| **3. G.I.T** Stomatitis, gingival hyperplasia, dysphagia, acid peptic disease, jaundice, acute and chronic hepatitis, cirrhosis of liver ascites | Diarrhoea Dysentery Amoebiasis Malabsorption |
| **4. CVS** Acute rheumatic fever rheumatic valvular heart disease, hypertension, ischemic heart disease, ifective endocarditis, common arryhythmias, congenital heart disease, congestive cardic failure. | |
| **5. RS** Pneumonia, COPD, Pulmonary TB, Bronehial asthma | Lung Abscess Pleural effusion Pneumothorax Bronchiectasis Lung cancers |
| **6. Haematology** Anaemias, bleeding & clotting disorders, leukemias, lymphomas, agranulocytosis, splenomegaly, oral manifestations of haematologic disorders, generalized lymphadenopathy | |
| **7. Renal System** Acute nephritis Nephrotic syndrome | Renal failure |
| **8. Nutrition** Avitaminosis | Balanced diet PEM Avitaminosis |
| **9. CNS** Facial palsy, facial pain including trigeminal | Meningitis Examination of comatose patient |

| | |
|---|---|
| neuralgia, epilepsy, headache including migraine. | Examination of cranial nerves. |
| **10. Endocrines**<br>Diabetes Mellitus Acromegaly, Hypothyrodism, Thyrotoxicosis, Calcium metabolism and parathyroids. | |
| **11. Critical care**<br>Syncope, cardiac arrest, CPR , shock | Ac LVF<br>ARDS |

**Text books recommended:**

| Title | Author | Edn. | Year | Publishers name and Place of Publn. | Price |
|---|---|---|---|---|---|
| Davison's Principles of Practice of Medicine | Edward Christopher | 18th | 1991 | Churchill Livingstone UK | Rs.1168/- |
| 2. Hutchison's Clinical Practice | Swash Michael | 21st | 2001 | Churchill Livingstone UK | Rs.595/- |

**Clinical** **Teaching Hrs - 90**
**(posting in a general hospital)**

1. Five complete cases must be written in a record book before the student takes the final examination.
2. The student must be able to take history, do general physiology examination (including build, nourishment, pulse, BP, temperature, edema, cyanosis, clubbing, jaundice, lymphadenopathy, oral cavity) and able to examine cardiovascular and respiratory systems, abdomen and the facial nerve and signs of meningeal irritation.

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION** **90 Marks**

1. Case History : 25 marks
2. Clinical Examination : 35 marks
3. Investigation : 10 marks
4. Diagnosis & D.D. : 10 marks
5. Management : 10 marks

# GENERAL SURGERY

**AIMS**

To acquaint the student with various diseases, which may require surgical expertise and to train the student to analyse the history and able to do a through 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 begin and malignant diseases and be able to decide which patient requires further evaluation.

**THEORY** **Teaching Hrs - 60**

**1. History of Surgery;**

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

**2. General Principles of Surgery;**

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

**3. Wounds;**

Their classification, hearing, repair, treatment, medico-legal aspects of accidental wounds and complication of wounds.

**4. Inflammation;**

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

**5. Infections;**

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

**6. Transmissible viral infections ;**

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

**7. Shock and Haemorrhage;**

Classification, causes, clinical features and management of various types of shock. Syncope, circulatory collapse. Haemorrhage- different types, causes, clinical features and management. Blood groups, blood

transfusion, precautions and complication of blood and their products. Hemophilias, their transmission, clinical features and management especially in relation to minor dental procedures.

**8. Tumours, Ulcers, Cysts, Sinus and Fistulae;**

Classification, clinical examination and treatment principles in various types of benign and malignant tumours, ulcers, cysts, sinus and fistulae.

**9. Disease of Lymphatic System;**

Especially those occurring in head and neck region. Special emphasis on identifying disease such as tubercular infection, lymphomas, leukaemias, metastatic lymph node diseases.

**10. Disease of the Oral cavity;**

Infective and malignant disease of the oral cavity and oropharynx including salivary glands with special emphasis on preventive aspects of premalignant and malignant diseases of the oral cavity.

**11. Diseases of Larynx, Nasopharynx;**

Infections and tumours affecting these sites. Indications, procedure and complications of tracheostomy.

**12. Nervous system;**

Surgical problems associated with nervous system with special reference to the principles of peripheral nerve injuries, their regeneration and principles of treatment. Detailed description of afflictions of facial nerve and its management. Trigeminal neuralgia, its presentation and treatment.

**13. Fractures;**

General principles of fractures, clinical presentation and treatment with additional reference to newer methods of fracture treatment. Special emphasis on fracture healing and rehabilitation.

**14. Principles of Operative Surgery;**

Principles as applicable to minor surgical procedures including detailed description of asepsis, antiseptics, sterilization, principles of anaesthesia and principles of tissue replacement. Knowledge of sutures, drain, diathermy, cryosurgery and use of Laser in surgery.

**15. Anomalies of development of face;**

Surgical anatomy and development of face. Cleft lip and cleft palate-principles of management.

**16. Diseases of thyroid and parathyroid;**

Surgical anatomy, pathogenesis, clinical features and management of dysfunction of thyroid and parathyroid glands. Malignant diseases of the thyroid-classification, clinical features and management.

**17. Swellings of the Jaw;**

Differential diagnosis and management of different types of swellings of the jaw.

**18. Biopsy ;**

Different types of biopsies routinely used in surgical practice.
Skills to be developed by the end of the 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.

**CLINICAL TRAINING** **Teaching Hrs - 90**

Clinical cases of swelling and ulcer

I – Swellings - Thyroid swellings
- Lipomas
- Sebaceous cysts
- Neurofibroma
- Demoid cyst
- Cervical lymphnodes
- Parotid tumours

II – Ulcers - TAD
- Venous ulcer
- Neuropathic ulcer
- Malignant ulcer

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION** **90 Marks**

**Long Case : one which includes**

| | |
|---|---|
| Case History | : 15 Marks |
| Clinical Examination | : 30 Marks |
| Suggested investigations | : 15 Marks |
| Diagnosis, DD | : 20 Marks |
| Management | : 10 Marks |

**Recommended Books :**

| Sl. No | Author | Title | Edn. | Publisher | Year of Publn. | Price |
|---|---|---|---|---|---|---|
| 1 | Somen Das | A Manual on Clinical Surgery | 4th | Dr. S. Das Calcutta | 1996 | Rs.430/- |
| 2 | Charles. V. Mann | Bailery & Love's Short Practice of Surgery | 23rd | OxfordUniversity Press | 2000 | $ 29.00 |
| 3 | Hamilton Bailery | Hamilton Baileys Demonstrations of Physical signs in Clinical Surgery | 18th | Butterworth Heinemann U.K. | 1997 | $ 67.50 |

**Other Books for Reference:**

1. Oxford Text Book of Surgery
2. Text Book of Surgery by Devita
3. Surgery by Sebastin
4. Surgery by somalal
5. Text book of surgery by Chatterjee
6. surgical anatomy by Lee Mc Gregor
7. Diseases of Eye by Parson
8. Text book of Phthalmology by Vasundev Anand Rao
9. E.N.T Diseases by Mohammed Muqbool
10. E.N.T Diseases by N.C. Day
11. E.N.T. Diseases by K.K.Ramalingam

# ORAL PATHOLOGY & ORAL MICROBIOLOGY

## OBJECTIVES

At the end of the course the student should be able to comprehend

- The different types of pathological processes that involve the oral cavity
- The manifestations of common diseases, their diagnosis & correlation with clinical pathological processes
- The oral manifestations of systemic diseases to help in correlating with systemic physical signs and laboratory findings.
- The underlying biological principles governing treatment of oral diseases.
- The principles of certain basic aspects of Forensic Odontology.

## SKILLS

- Microscopic study of common lesions affecting oral tissues through microscopic slides & projection slides
- Study of disease process by surgical specimens
- Study of teeth anomalies/polymorphisms through tooth specimens & plaster casts.
- Microscopic study of plaque pathogens.
- Study of haematological preparations of anemias and leukemias.
- Basic exercises in Forensic Odontology

## SYLLABUS FOR II-BDS — Teaching Hrs - 25

### INTRODUCTION
**(1 hour)**

1. A bird's eye view of 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 is to be emphasized.

2. Developmental disturbances of teeth, jaws and soft tissues of Oral and Para oral regions:
   **(12hours)**
   - Introduction to developmental disturbances – Hereditary, Familial, Mutation and Hormonal etc. causes to be highlighted.
   - Developmental disturbances of jaws – Agnathia, Micrognathia, Macrognathia, Facial hemihypertrophy, Facial hemiatrophy.
   - Developmental disturbances of oral and Para oral soft tissues –
     i. Lip & Palate-congenital lip pits and commissural pits and fistulas, double lip, cleft lip,cleft palate, chelitis glandularis, chelitis granulomatosa, hereditary intestinal polyposis, hereditary melanotic macule.
     ii. Oral mucosa – fordyce's granules, focal epithelial hyperplasia.
     iii. Gingiva – fibromatosis gingiva, retrocuspid papilla.
     iv. Tongue – macroglossia, microglossia, ankyloglossia, cleft tongue, fissured tongue, median rhomboid glossitis, benign migratory glossitis, hairy tongue.

v. Lymphoid tissue – reactive lymphoid aggregates, lymphoid hamartoma, angiolymphoid hyperplasia, lymphoepithelial cyst.
vi. Salivary glands – aplasia, xerostomia, hyperplasia of palatal glands, atresia, abberancy, stafne's cyst.

- Developmental disturbances of teeth – Aetiopathogenesis, clinical features, radiological features & histopathological features as appropriate of teeth and clinical significance of the anomalies to be emphasized.
  i. Size - microdontia, macrodontia.
  ii. Shape – fusion, gemination, concrescence, dilacerations, Talon's cusp, dense in dente, dens evaginatus, taurodontism, supernumerary roots, enameloma.
  iii. Number – anodontia, supernumerary teeth, pre deciduous and post permanent dentition.
  iv. Structure – amelogenesis imperfecta, enamel hypoplasia, dentinogenesis imperfecta, dentinal dysplasia, regional odontodysplasia, shell teeth.
  v. Eruption – premature eruptions, eruption sequestrum, delayed eruptions, multiple unerupted teeth, submerged teeth.
- Developmental/fissural cysts - median palatal cyst, globulomaxillary cyst, median mandibular cyst, naso-alveolar cyst, palatal cyst of neonate, thyroglossal duct cyst, epidermoid & dermoid cyst, nasopalatine cyst.

3. Dental caries:
**(5 hours)**
   - Aetiopathogenesis, microbiology, clinical features, classification, diagnosis, histopathology, immunology, prevention of dental caries and its sequelae. Factors influencing and caries activity tests.

4. Periodontal diseases: **(4 hours)**
   - Aetiopathogenesis, microbiology, clinical features histopathology & radiological features (as appropriate) of gingivitis, gingival enlargements & periodontitis. Basic immunological mechanisms of periodontal disease to be highlighted.

5. Physical and chemical injuries – **(5 hours)**
   - Physical injuries to teeth – bruxism, tooth ankylosis.
   - Physical injuries to bone – traumatic cyst, effects of orthodontic tooth movement.
   - Physical injuries to soft tissue – factitial injuries, traumatic ulcers, denture related injuries, mucocele, salivary duct cyst.
   - Chemical injuries – asprin burn, lead, mercury & bismuth poisoning, acrodynia, silver, tetracycline, dilantin sodium enlargement, angioneurotic edema, stomatitis medicamentosa and veneneta.
   - Radiation injuries of oral tissues.

6. Pulp and periapical pathology and osteomyelitis. **(5 hours)**
   - aetiopathogenesis & interrelationship, clinical features, microbiology, histopathology & radiological features (as appropriate) of pulp diseases – pulpitis, focal reversible pulpitis, chronic pulpitis, pulp polyp.
   - aetiopathogenesis & interrelationship, clinical features, microbiology, histopathology & radiological features (as appropriate) of periapical lesions – periapical granuloma, periapical abscess, periapical cyst.
   - Osteomyelitis – acute suppurative osteomyelitis, chronic focal & diffuse sclerosing osteomyelitis, garre's osteomyelitis.

7. Microbial infections of oral soft tissues: **(10 hours)**
   - Microbiology, defense mechanisms including immunological aspects, oral manifestations, histopathology and laboratory diagnosis of common bacterial, viral, fungal infections.
     a) Bacterial- scarlet fever, diphtheria, actinomycosis, tetanus, Tuberculosis, Syphilis, ANUG & its complications –cancrum oris.
     b) Viral – Herpes Simplex, Varicella zoster, Measles, Mumps, rubella, chicken pox, cytomegalic inclusion disease, HIV infection and oral manifestations, Recurrent apthous ulcers, In brief – Covid-19 pathogenesis, clinical features, oral manifestations and investigations
     c) Fungal – Candidal infections, histoplasmosis, phycomycosis, rhinosporidiosis.

8. Common non-inflammatory diseases involving jaws: **(6 hours)**
   - Aetiopathogenesis, clinical features, radiological & laboratory values in diagnosis of: Fibrous dysplasia, Cherubism, Osteogenesis imperfecta, Paget's disease, infantile cortical hyperostosis, craniofacial dysostosis, mandibulofacial dysostosis, Cleidocranial dysplasia, Rickets, Achondroplasia, Pierre robin syndrome, Marfan's syndrome, & Down's syndrome, osteopetrosis.

9. Diseases of TM Joint: **(2 hours)**
   - Ankylosis, summary of different types of arthritis & other developmental malformations, traumatic injuries & myofascial pain dysfunction syndrome.

10. Cysts of odontogenic region: **(6 hours)**
    - Classification, aetiopathogenesis, clinical features, histopathology laboratory & radiological features (as appropriate) of odontogenic cysts- primordial cyst, odontogenic kerato cyst, dentigerous cyst, dental lamina cyst of new born, gingival cyst of adults, calcifying odontogenic cyst,radicular cyst.

11. Tumors of the oral cavity: **(10+31 hours)**

- Classification of odontogenic, non-odontogenic tumors. aetiopathogenesis, clinical features, histopathology laboratory & radiological features (as appropriate) of the following tumors:-

- **Odontogenic –**
  i. Ectodermal tumors – ameloblastoma, calcifying epithelial odontogenic tumor, adenomatoid odontogenic tumour.
  ii. Mesenchymal tumors – peripheral and central odontogenic fibroma, odontogenic myxoma, periapical cemental dysplasia,benign cementoblastoma, gigantiform cementoma, dentinoma.
  iii. Mixed tumors of odontogenic origin- ameloblastic fibroma, ameloblastic fibro-odontoma, odontoma, teratoma.

- **Non-odontogenic**
  i. Benign epithelial –Papilloma, Keratoacanthoma,& Naevi
  ii. Premalignant lesions and conditions.
  iii. Benign mesenchymal – Fibroma, Giant cell fibroma, peripheral and central ossifying fibroma, Lipoma, Haemangioma, Lymphangioma, , Chondroma, Osteoma, osteoid osteoma, benign osteoblastoma, Tori & multiple exostoses.
  iv. Malignant epithelial – Cancer-Epidemiology,Etiology, Clinical and Histopathological features, TNM classification, recent advances in diagnosis, management and prevention -Basal Cell Carcinoma, Verrucous Carcinoma, Squamous Cell Carcinoma, & Malignant Melanoma.
  v. Malignant mesenchymal –Fibrosarcoma, Osteosarcoma, Giant cell tumor, Chondrosarcoma, Angiosarcoma, Kaposi's sarcoma, Lymphomas, Ewing's sarcoma, multiple myeloma, solitary plasma cell myeloma.
  vi. Tumors of muscle tissue origin –leiomyoma, rhabdomyoma, congenital epulis of new born, granular cell myoblastoma.
  vii. Benign and malignant tumors of nerve tissue origin - Neurofibroma, Schwannoma, traumatic neroma, melanotic neuroectodermal tumor of infancy, malignant schwannoma.
  viii. Metastatic tumors – tumors metastasizing to and from oral cavity and the routes of metastasis.

12. Salivary gland tumors **–** **(7 hours)**

Classification, aetiopathogenesis, clinical features, histopathology laboratory & radiological features (as appropriate) of

- Benign epithelial neoplasms – Pleomorphic adenoma,monomorphic adenomas, Warthin's tumor, Oncocytoma,
- Malignant epithelial neoplasms –malignant pleomorphic adenoma, Adenoid cystic carcinoma, Mucoepidermoid carcinoma, central mucoepidermoid carcinoma, Acinic cell carcinoma, Adenocarcinomas, clear cell carcinoma.

- Non-neoplastic enlargements of salivary glands – Sjogren's syndrome, Mikulicz's disease.

13. Traumatic, reactive and regressive lesions of oral cavity: **(3 hours)**
    - Pyogenic & Giant cell granuloma, Exostoses, Fibrous hyperplasia, Traumatic ulcer and Traumatic neuroma.
    - Attrition, abrasion, erosion, Bruxism, dentinal changes, pulp calcifications, & resorption of teeth, hypercementosis and cementicles.
14. Healing of oral wounds and complications –**(4 hours)**
    a) Factors affecting
    b) Biopsy & healing of biopsy wounds, biopsy techniques
    c) Basic aspects of exfoliative cytology
    d) Healing of extraction wound and dry socket
    e) Healing of fracture
    f) Re-implantation and transplantation of tooth

15. Non neoplastic salivary gland diseases **(2 hours)**
    - Sialolithiasis, sialosis, sialadenitis, xerostomia, & ptyalism.

16. Systemic diseases involving oral cavity **(6 hours)**
    - Brief review & oral manifestations, diagnosis & significance of common blood, nutritional, hormonal & metabolic diseases.

17. Mucocutaneous lesions: **(10 hours)**
    - Aetiopathogenesis, clinical features, histopathology of following common lesions: Lichen Planus, Lupus Eryhtematosus, Pemphigus & Pemphigoid lesions, Erythema Multiforme, Psoriasis, Scleroderma, Ectodermal Dysplasia, Epidermolysis bullosa & White sponge nevus.

18. Diseases of nerves:
    **(3 hours)**
    - Facial neuralgias – Trigeminal & Glossopharyngial. VII nerve paralysis, Causalgia.
    - Psychogenic facial pain & burning mouth syndrome.

19. Pigmentation of oral and Para oral region & discoloration of teeth **(2 hours)**
    - Causes & clinical manifestations.

20. Diseases of maxillary sinus; **(2 hours)**
    - Traumatic injuries to sinus, sinusitis, cysts and tumors involving antrum.

21. Biopsy: types of biopsy, value of biopsy, cytology, histochemistry and frozen sections in diagnosis of oral diseases. **(2 hours)**

22. Spread of oral infection – **(2 hours)**
cellulitis, Ludwig's angina, intracranial complications of dental infections,
Focal infection and foci of infection.

23. Principles of basic Forensic Odontology (pre-clinical Forensic Odontology) **(5 hours)**

- Introduction, definition, aims, scope.
- Sex and ethnic (racial) differences in tooth morphology and histological age estimation.
- Determination of sex and blood group from buccal mucosa/saliva.
- Dental DNA methods.
- Bite marks, rugae pattern & lip prints.
- Dental importance of poisons and corrosives.
- Overview of forensic medicine and toxicology.

24. Introduction to immunohisto chemistry **(1 hour)**

**Practicals** **Teaching Hrs - 130**

Identification of the histopathological slides of following lesions

1) Pit And Fissure Caries
2) Smooth Surface Caries
3) PulpHyperaemia
4) Pulp Polyp
5) PulpAbscess
6) Periapical Granuloma
7) Periapical Cyst
8) Cholesterol Clefts
9) Cholesterol Crystals
10) RustonBodies
11) Dentigerous Cyst
12) Odontogenic Keratocyst
13) Radicular Cyst
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
22) Fordyce's Spot
23) White Sponge Nevus
24) Papilloma
25) Fibroma
26) Lipoma
27) Capillary Haemangioma
28) Cavernous Haemangioma

29) Lymphangioma
30) Neurilemmoma
31) Basal Cell Carcinoma
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) Junctional Nevus
38) Compound Nevus
39) Intradermal Nevus
40) Osteosarcoma
41) Fibrosarcoma
42) Chondrosarcoma
43) Verruciform Xanthoma
44) Pyogenic Granuloma
45) Congenital Epulis
46) Fibrous Dysplasia
47) Peripheral Ossifying Fibroma
48) Central Ossifying Fibroma
49) Paget's Disease
50) Acute Osteomyelitis
51) Chronic Osteomyelitis
52) Cancellous Osteoma
53) Peripheral Giant Cell Granuloma
54) Central Giant Cell Granuloma
55) Ameloblastoma (Follicular)
56) Ameloblastoma (Plexiform)
57) Ameloblastoma (Granular Cell Varient)
58) Ameloblastoma (Acanthomatous)
59) Ameloblastoma (Cystic)
60) Adenomatoid Odontogenic Tumour
61) Cementoblastoma
62) Ameloblastic Fibroma
63) Compound Odontome
64) Calcifying Epithelial Odontogenic Tumour
65) Pleomorphic Adenoma
66) Warthin's Tumour
67) Mucoepidermoid Carcinoma (High Grade)
68) Mucoepidermoid Carcinoma (Low Grade)
69) Adenoid Cystic Carcinoma
70) Necrotizing Sialometaplasia
71) Lichen Planus
72) Psoriasis
73) Pemphigus Vulgaris
74) Bullous Pemphigoid
75) Actinomycosis
76) Tuberculosis
77) Herpes Simplex

- Age estimation by Cemental annulations – 2 hours

- Palatal rugae pattern – 2 hours
- Studying lip prints – 2hours
- Bite mark identification – 2 hours

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION 90 Marks**

Spotters - 13 slides ( 13 x 5 marks) = 65 marks
5 specimens ( 5 x 5 marks) = 25 marks

RECOMMENDED BOOKS


1. Shafer's text book of oral pathology – Shafer, Hine,Levy
2. Oral Pathology – clinincal and pathological correlations – Regezi, Scuibba, Jordan
3. Oral pathology – Soames and Southam's
4. Oral pathology in the tropics – Prabhu, Wilson, Johnson & Daftary

# ORAL MEDICINE & RADIOLOGY

## Oral Medicine & Radiology syllabus for III BDS 2007 regulations

**Syllabus for III BDS** **Teaching Hrs. 20**

| Sl No | TOPIC | Student is expected to know | No. of hours |
|---|---|---|---|
| 1. | Introduction to oral medicine | Various definitions and terminologies commonly used in oral medicine | 1hr |
| 2. | Case history and clinical examination | Examination of patient and case history taking | 1 hr |
| 3. | Abnormalities of the teeth | Developmental abnormalities<br>Acquired abnormalities | 2 hrs |
| 4. | Developmental disorders of the jaws, tongue, oral mucosa | Knowledge of normal development ,Identification & Management of disorders | 2 hrs |
| 5. | Periodontal diseases | Gingivitis<br>Periodontitis<br>Gingival Bleeding causes<br>Gingival enlargement | 1 hrs |
| 6. | Lymphatic drainage of head & neck & Differential diagnosis of cervical lymphadenopathy | Anatomy of lymphatic drainage, Examination of lymph nodes<br>Pathologies affecting lymph nodes of the head and neck region.<br>Differential diagnosis<br>Management | 2 hrs |
| 7. | Facial Pain | Case history & Examination<br>Pain pathway (In brief)<br>Clinical features, Differential diagnosis & management of odontogenic origin, neurogenic origin muscular origin, TMJ & other pains | 3 hrs |
| 8. | Acute & chronic infections of the jaws | Odontogenic infections and its sequelae .Osteomyelitis, classification, predisposing factors and treatment<br>Foci of oral infection and its ill effects | 2 hrs |
| 9. | Infections of the Oral and paraoral strucutres | Bacterial-Streptococcal, tuberculosis, syphilis, Vincents, Leprosy, Actinomycosis, Diphtheria, Tetanus<br>Fungal-Candida albicans, Deep fungal infectionsVirus-Herpes simplex, Herpes zoster,Ramsay hunt syndrome, Measles, | 3 hrs |

| | | | |
|---|---|---|---|
| | | herpangina, Mumps, Infectious mononucleosis, AIDS and Hepatitis B | |
| 10. | Laboratory investigations in oral medicine | Advise and interpret various biochemical, hematological, microbiological & pathological investigations | 2 hrs |
| 11. | Forensic Odontology | Medicolegal aspects<br>Identification of bite marks<br>Determination of age and sex<br>Identification of cadaver by dental appliances, restoration and tissue remnants , Postmortem radiological methods | 2 hrs |
| 12. | Dental therapeutics | Various medications commonly used in dentistry. Mouth washes ,Styptics, astringents, demelucents, Sialogogues, Topical preparations, Antibiotics, Analgesics, Corticosteroids, Cancer chemotherapy drugs | 2 hrs |
| 13. | White lesions | Variations in structure and appearance of normal mucosa, Non keratotic white lesion ,Oral CandidiasisKeratotic lesions with no malignant potentialOral genodermatosisKeratotic lesions with malignant potentialLeukoplakia, OSMF, Lichenplanus, lichenoid reaction & othersEtiology, Clinical features, Differential diagnosis & management | 2 hrs |
| 14. | Ulcerative & Vesicullo Bullous lesions | Examination of an ulcer EtiologyClinical features, Differential diagnosis & management of traumatic ulcer, Apthous ulcer, Viral ulcers, Pemphigus, Pemphigoid, Erythema multiforme ,Steven Johnson syndrome | 2 hrs |
| 15. | Pigmented lesions affecting oral mucosa | CausesEndogenous& Exogenous Clinical features, Differential diagnosis & management | 1 hr |
| **Radiology** | | | |
| 16 | Introduction | Definition of Radiology<br>Brief historical background | |

| | | | |
|---|---|---|---|
| | | Electromagnetic spectrum<br>Properties of X rays | 1hr |
| 17 | Construction and working of x ray tube | Parts of X ray machine and tube<br>Functioning of X ray tubeBremsstrahlung Radiation<br>Characteristic radiation | 1hr |
| 18 | Factors controlling X ray beam | Tube voltage<br>Exposure time<br>Tube current<br>Filtration<br>Collimation<br>Inverse Square Law | 1hr |
| 19 | Interaction of x rays with matter | Beam attenuation<br>Coherent scatter<br>Compton scatter<br>Photoelectric absorption | 1hr |
| 20 | Ideal radiograph | Definition<br>Criteria to evaluate periapical radiograph<br>Factors controlling diagnostic quality of radiograph | 1hr |
| 21 | Faulty radiographs | Causes & remedy | 1hr |
| 22 | Radiation biology | Definition<br>Radiation chemistry<br>(Direct and indirect effects)<br>Changes in biologic molecules<br>Radiation effects at cellular level<br>Concept of radio sensitivity<br>Radiation effects at tissue and organ level<br>(Short term and long term effects)<br>Radiation effects on Oral cavity<br>Radiation Genetics | 1hr |
| 23 | Radiation protection | Sources of Radiation:<br>Natural Radiation<br>Manmade radiation<br>Exposure and Dose in radiography<br>Occupational exposure<br>Paient exposure<br>Maximum Permissible dose<br>Principle of Radiation protection<br>Radiation protection measures<br>Dosimetry | 1hr |
| 24 | Anatomic landmarks in periapical radiograph | Those common to both jaws<br>Maxillary landmarks<br>Mandibular landmarks | 2hrs |
| 25 | Role of radiography in diagnosis of dental caries | Rationale for radiographic examination<br>Type of radiographs | 1hr |

| | | | |
|---|---|---|---|
| | | Frequency of Radiographic examination<br>Radiographic features of dental caries<br>Radiographic differential diagnosis of dental caries | |
| 26 | Role of radiography in diagnosis of periodontal disease | Usefulness of radiography in diagnosis and treatment planning of periodontal disease<br>Limitations<br>Radiographic features of different periodontal conditions | 1hr |

## Oral Medicine & Radiology syllabus for IV BDS (BDS 2007 regulations)

**ORAL MEDICINE :** **Teaching Hrs - 45**

| | | | |
|---|---|---|---|
| 1 | Systemic review in oral medicine – I (CVS System) | Pathophysiology (In brief) & clinical features<br>Investigations<br>Dental implications | 1hr |
| 2 | Systemic review in oral medicine – II (Respiratory System) | Pathophysiology (In brief) & clinical features<br>Investigations<br>Dental implications | 1hr |
| 3 | Systemic review in oral medicine – III (GIT) | Pathophysiology (In brief) & clinical features<br>Investigations<br>Dental implications | 1hr |
| 4 | Systemic review in oral medicine – IV (Endocrine) | Pathophysiology (In brief) & clinical features<br>Investigations<br>Dental implications | 1hr |
| 5 | Systemic review in oral medicine – V(Renal System) | Pathophysiology (In brief) & clinical features , Investigations<br>Dental implications | 1hr |
| 6 | Systemic review in oral medicine – VI (Hematologic) | RBC, WBC, Platelet disorders.<br>Causes of bleeding from oral cavity and its investigation, & management | 2 hrs |
| 7 | Dental consideration in pregnant patient | Dental management of pregnant patients<br>Drugs contraindicated | 1hr |
| 8 | Nutritional deficiencies affecting oral cavity | Vitamin deficiencies and their oral manifestations<br>Mineral deficiencies and their oral | 1hr |

| | | | |
|---|---|---|---|
| | | manifestations | |
| 9 | Metabolic disorders affecting oral cavity | Defects in carbohydrate, lipid, protein metabolism and their oral manifestations | 1 hr |
| 10 | Salivary gland disorders | Developmental disorders<br>Inflammatory disorders<br>Reactive & obstructive disorders<br>Autoimmune disorders<br>Sialoses<br>Neoplastic disorders<br>Functional disorders<br>Bilateral salivary gland enlargement | 2 hrs |
| 11 | Disorders of the Bone | Developmental Disorders (Agenesis, Aplasia,Hypoplasia,Hyperplasia, Exostosis, Tori)<br>Generalised-Ostoeporosis,Osteopetrosis,Osteogeneis Imperfecta, Infantile cortical hyperostosis, Marfans syndrome<br>Acquired disorders<br>Traumatic involvement | 2 hrs |
| 12 | Cysts | Soft tissue<br>Bone-Odontogenic and Nonodontogenic | 2 hrs |
| 13 | Tumors | Soft tissue-Epithelium, connective tissue, Vascular, Nerve tissue<br>Hard tissues-Odontogenic, Nonodontogenic | 2 hrs |
| 14 | Tongue in health & disease | Developmental disorders, Acquired disorders | 1hr |
| 15 | Dermatological diseases with oral manifestation | Ectodermal dysplasia, Papillon Lefevre syndrome, Lichen planus, Psoriasis, Erythema multiforme, Pemphigus ,Lupus erythematosus, Scleroderma, Bechets syndrome, Reiters syndrome,Oral genodermatosis | 2 hrs |
| 16 | Granulomatous Diseases | Tuberculosis, Sarcoidosis, Midline lethal Granuloma, Chrons disease, Histocytosis X | 1hr |
| 17 | Allergy | Local allergic reactions, Anaphylaxis, Local and systemic allergic manifestations to food, drugs, chemicals and dental materials | 1hr |
| 18 | Oral cancer | Etiology<br>Signs & symptoms<br>TNM classification<br>Prognosis<br>Management<br>Rehabilitation | 2 hrs |

| | | | |
|---|---|---|---|
| 19 | Nerve and muscle disorders | Facial nerve palsy, syndromes,<br>Neuromas, Neuralgias<br>Neurofibromatosis<br>Myositis Ossificans, Trismus | 1hr |
| 20 | Infectious diseases | Infectious diseases in dentistry<br>Infection control | 1hr |
| 21 | HIV infection | Oral manifestations<br>Lab investigations<br>Dental considerations | 1hr |
| 22 | Emergencies in dental practice | Identification of common medical emergencies and their management in dental clinic | 1hr |

**RADIOLOGY**

| | | | |
|---|---|---|---|
| 21 | Periapical radiolucencies | Anatomical<br>Pathological<br>True<br>False<br>Differential diagnosis | 1hr |
| 22 | Multilocular radioluciences | Types<br>Differential diagnosis | 2 hrs |
| 23 | Radioopacities in the jaws | Anatomical<br>Pathological<br>Generalized<br>Differential diagnosis | 2 hrs |
| 24 | Mandibular fractures | Radiographic examination of mandible<br>Interpretation of radiograph | 1hr |
| 25 | Maxillary fractures | Radiographic examination of maxilla<br>Interpretation of radiograph | 1hr |
| 26 | Radiographic features of the diseases of maxillary antrum | Infections<br>Cyst<br>Neoplasms<br>Radiographic differential diagnosis | 1hr |
| 27 | Radiographic features of the diseases of TMJ | Trauma<br>Ankylosis<br>Degenerative diseases<br>Radiographic differential diagnosis | 1hr |
| 28 | Soft tissue calcifications | Dystrophic calcification<br>Metastatic calcification<br>Heterotrophic calcification | 1hr |
| 29 | Sialography | Indications ,Contraindications<br>Procedure<br>Interpretation | 1hr |
| 30 | Recent imaging modalities and its application in dentistry | CT ,MRI, Ultrasound<br>Bone scan ,Digital radiography | 2 hrs |

## Books recommended

1. Burkets Oral Medicine, Diagnosis and Treatment-Lynch, Brightman & Greenberg
2. Medical problems in dentistry-Scully & Cawson
3. Principles and Practice of Oral Medicine-Soins, Fazio & Fang
4. Differential diagnosis of Oral and maxillofacial lesions-Wood &Goaz
5. Oral and Maxillofacial Pathology-Neville, Damm, Allen, Bouquot
6. Text book of Oral pathology –Shafer, Hine& Levy
7. Oral Pathology, Clinical-pathologic correlations –Regezi & Sciubba
8. Oral Radiology, Principles and Interpretation-White & Pharoah
9. Essentials of Dental Radiography and Radiology-Eric Whaites

Note : Students are requested to procure the latest edition available for each of the titles

## Clinical Exercises — Teaching Hrs– 200

### III & IV year BDS (inclusive)

**Oral Medicine**

1.Detailed presentation of case histories of (minimum) 15 special cases.

**Radiology**

1. Taking IOPAR for at least 25 cases processing and interpreting them
2. Taking atleast 2 bitewing radiographs and processing them.

**Clinical Discussion**

| Sl. No. | Topic | Student is expected to know |
|---|---|---|
| 1 | Films used in dental radiology | Composition of X ray film<br>Direct exposure film<br>Screen film, Periapical film, Bitewing film<br>Occlusal film<br>Film speed |
| 2 | Intraoral radiographic techniques | Bisecting angle technique<br>Paralleling technique<br>Comparison of the two techniques |
| 3 | Processing of X ray films | Concept of Latent image<br>Composition and function of processing solutions<br>Darkroom requirements<br>Manual processing<br>Automatic processing |
| 4 | Extraoral radiograph | Definition |

| | | |
|---|---|---|
| | | Films used in extraoral radiography<br>X ray machine used<br>Type of extraoral radiographs<br>Interpretation of ectraoral radiographs |
| 5 | Intensifying screens, Girls & Cassettes | Definition<br>Function<br>Composition<br>Types |
| 6 | Radiography of traumatized teeth | Type of radiographic examination<br>Radiographic features of traumatized teeth<br>Bennett's classification of traumatized teeth<br>Radiographic DD of fractures teeth |
| 7 | Localization techniques | Objective<br>Methods |

**Clinical Demonstration**

1. Demonstration of the following radiographic techniques :
   - i. Maxillary and Mandibular occlusal view
   - ii. Orthopanthomograph
   - iii. Lateral cephalogram
   - iv. Postero anterior view of mandible
   - v. Paranasal sinus view
   - vi. Reverse Towne's view
   - vii. Submentovertex view
   - viii. Lateral oblique view for ramus and body of mandible

2. Identification of the above mentioned radiographs and their interpretation.

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION 90 Marks**

1. Clinical in Oral Medicine : 60 marks (recording long case)
   - a. Case history 20 marks
   - b. Diagnosis & differential diagnosis 15 marks
   - c. Investigations 15 marks
   - d. Management 10 marks

2. Clinicals in Radiology : 30 marks (one intra –oral periapical radiograph)
   - a. Technique 10 marks
   - b. Processing 10 marks
   - c. Interpretation 10 marks

# PAEDIATRIC & PREVENTIVE DENTISTRY

**Third Year** **Teaching Hrs - 20**

**Theory**

**1. Introduction to paedodontics & Preventive Dentistry**

Definition, Scope, objectives and Importance

**2. Growth & Development**

Importance of study of growth and development in Paedodontics.
Prenatal and Postnatal factors in growth & development
Theories of growth & development.
Development of maxilla and mandible and related age changes

3. **Development of occlusion from birth through adolescence**

- Study of variations and abnormalities.

**4. Dental anatomy and Histology**

- Development of teeth and associated structures
- Eruption and shedding of teeth
- Teething disorders and their management
- Chronology of eruption of teeth.
- Differences between deciduous and permanenth teeth
- Development of dentition from birth to adolesce3nce
- Importance of first permanent molar.

**5. Dental Radiology related to paedodontics.**

**6. Dental Caries:**

- Historical background
- Definition, aetiology & pathogenesis.
- Caries pattern in primary, young permanent and permanent teeth in children
- Rampant caries, early childhood caries and extensive caries:
  - Definition, aetiology, Pathogenesis, Clinical features, Complications and Management.
- Role of diet and nutrition in Dental Caries.
- Dietary modifications & Diet conselling.
- Caries activity, tests, caries predication, caries susceptibility and their clinical application.

**7. Gingival & Periodontal Diseases in Children**

- Normal gingival & periodontium in children
- Definition, aetiology & Pathogenesis.
- Prevention & Management of gingival & Periodontal diseases.

**8. Dental Materials used in Paediatric Dentistry**

**9. Preventive Dentistry**

- Defination
- Principles & Scope
- Types of Prevention
- Different preventive measures used in Paediatric Dentistry including pit and fissure sealans and caries vaccine.

**10. Dental Health Educaion & School Dental Health Programmes.**

**11. Fluorides :**

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

**12. Case History Recording:**

Outline of principles of examination, diagnosis & treatment planning.

**Clinicals III BDS** **Teaching Hrs - 70**

- Wax carving of upper and lower primary teeth
- Preparation of class I and II cavity on extracted / typhodont teeth
- Oral prophylaxis and fluoride application – 2 cases each
- Class I and Class II restorations - 6 each

**Fourth Year Theory** **Teaching Hrs – 45**

**1. Oral surgical procedures in children**

- Indications and contraindications of extractions of primary and permanenth teeth in children
- Knowledge of Local and General Anaesthesia
- Minor surgical procedures in children.

**2. Child Psychology**

- Definition
- Theories of child psychology.
- Psychological development of children with age.
- Principles of psychological growth & development while managing child patient
- Dental fear and its management.
- Factors affecting child's reaction to dental treatment

**3. Behaviour Management**

- Definitions
- Types of behaviour encountered in the dental clinic
- Non-pharmacological & pharmacological methods of Behaviour Management

## 4. Paediatric operative Dentistry

- Principles of Paediatric Operative Dentistry.
- Modifcations required for cavity preparation in primary and young permanent teeth.
- Various Isolation Techniques.
- Restoration of decayed primary, young permanent and permanent teeth in children using various restorative materials like Glass Ionomer, Composites and Silver Amalgam. Stainless steel, Polycarbonate & Resin Crowns.

## 5. Paediatric Endodontics

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

## 6. Traumatic injuries in children

- Classifications & importance
- Sequelae & reaction of teeth to trauma.
- Management of Traumatised teeth

## 7. Preventive Interceptive orthodontics

- Definition
- Problems encounterd during primary and mixed dentition phases and their management
- Serial extractions.
- Space management.
- Introduction to fixed orthodontics

## 8. Oral habits in children

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

## 9. Dental care of children with special needs

- Definition, Aetiology, classification , Behavioural and Clinical features & Management of children with :
    - Physically handicapping conditions

- Mentally compromising conditions
- Medically compromising conditions.
- Genetic disorders

**10. Congenital abnormalities in Children**

- Definition, Classification, Clinical features & Management

**11. Lasers in pediatric dentistry**

**12.Dental Emergencies in Children & Their Management**

**13. Setting Up Of Paedodontic Clinic**

**14. Ethics.**

**Clinicals IV Year** **Teaching Hrs - 130**

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

Restorations- Class I & II only:45
Preventive measures e.g. Oral prophylaxis- 20
Fluoride applications-10
Extractions-25
Case History Recording & Treatment Planning-10
Education & motivation of the patients using disclosing agents.
Educating patients about oval hygiene measures like tooth brushing, flossing etc.

**Books Recommended & References**


1. Paediatric Dentistry (Infancy through Adolescences)-Pinkham
2. Kennedy's pediatric operative Dentistry- Kennedy & curzon
3. Occlusal guidance in paediatric Dentistry- Stephen H. Wei
4. Clinical use of Fluorides- Stephen H. Wei
5. Paediatric Oral & Maxillofacial surgery –Kaban.
6. Paediatric Medical Emergencies- P.S.Whatt
7. Understanding of Dental caries- Niki Foruk
8. An Atlas of Glass Ionomer cements- G.J. Mount.
9. Clinical pedodontics- Finn.
10. Textbook of Pediatric Dentistry- Braham Morris.
11. Primary preventive Dentistry- Norman O. Harris.
12. Hand book of clinical pedodontics- Kenneth.D.
13. Preventive Dentistry- Forrester.
14. The Metabolism and Toxicity of Fluoride- Garry M Whitford
15. Dentistry for the child and Adolescent-Mc. Donald
16. Pediatric Dentistry- Demle S.G.
17. Behaviour Management- Wright
18. Pediatric Dentistry-mathewson
19. Traumatic Injuries- Andreason
20. Occlusal guidance in pediatric Dentistry- Nakata

21. Pediatric Drug Therapy- Tomare
22. Contemporary Orthtodontics- Profitt.
23. Preventive Dentistry- Depaola.
24. Metabolism & Toxicity of Fluoride- Whitford. G.M.
25. Endodontic Practice - Grossman
26. Principles of Endodontics – Munofrd
27. Endodontics- Ingle.
28. Pathways of pulp- Cohen.
29. Management of Traumaized anterior Teeth- Hargreaves.

## CLINICAL / PRACTICALUNIVERSITY EXAMINATION 90 Marks

Clinical Examination consists of two exercises:

**Exercise 1 :** **Marks Allotted :30**
(Common for all students)

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

**Exercise 2 :** **Marks Allotted: 60**
(Any one of the following Exercise – by lot)

1. Oral Prophylaxis & Fluoride Application
- Management of Child = 10 Marks
- Oral Prophylaxis = 25 Marks
- Topical Flouride Application = 20 Marks
- Post Operative Instructions = 05 Marks

2. Restoration of Tooth
- Management of Child = 10 Marks
- Cavity Preparation = 25 Marks
- Isolation, Lining, Matrix Band Application = 10 Marks
- Filling, Carving & Finishing = 10 Marks
- Post –operative Instructions = 05 Marks

3. Extraction of tooth
- Management of Child = 10 Marks
- Local Anesthesia = 15 Marks
- Extraction = 25 Marks
- Prescription = 05 Marks
- Post – operative Instructions = 05 Marks

# ORTHODONTICS & DENTOFACIAL ORTHOPAEDICS

**Goals:**

The dental graduates during training in the institution 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 disease of the teeth, mouth, jaws and associated tissues.

**Objectives:**

Undergraduate programme in Orthodontics is designed to enable the qualifying dental surgeon to diagnose, analyse and treat common orthodontic problems by preventive, interceptive and corrective orthodontic procedures.

Objectives are dealt under 3 headings

**SYLLUBUS**

**THEORY**

The following basic instructional procedures will be adapted to achieve the above objectives

**III rd year** **Teaching Hrs - 20**

1. Introduction, Definition, Historical Background, Aims and Objectives of Orthodontics and Need for Orthodontic care.

2. **Growth and Development**: In General
   Definition
   Growth spurts and Differential growth
   Factors influencing growth and Development
   Methods of measuring growth
   Growth theories (Genetic, Sicher's, Scott's, Moss's, Petrovic's, Multifactorial)
   Genetic and epigenetic factors in growth .
   Cephalocaudal gradient in growth ..

**3. Morphologic Development Of Craniofacial Structures**
   Methods of bone growth
   Prenatal growth of craniofacial structures
   Postnatal growth and development of: cranial base, maxilla, mandible, dental arches and occlusion .

**4. Functional Development of Dental Arches and Occlusion**
   Factors influencing functional development of dental arches and occlusion.
   Forces of occlusion
   Wolfe's law of transformation of bone
   Trajectories of forces

## 5. Clinical Application of Growth and Development

## 6. Malocclusion - In General

Concept of normal occlusion
Definition of malocclusion
Description of different types of dental, skeletal and functional malocclusion.

## 7. Classification of Malocclusion

Principle, description, advantages and disadvantages of classification of malocclusion by Angle, Simon, Lischer and Ackerman and Proffit.

## 8. Normal and Abnormal Function of Stomatognathic System

## 9. Aetiology Of Malocclusion

Definition, importance, classification, local and general aetiological factors.
Etiology of following different types of malocclusion:
- Midline diasthema
- Spacing
- Crowding
- Cross-Bite: Anterior/Posterior
- Class III Malocclusion
- Class II Malocclusion
- Deep Bite
- Open bite

## 10. Diagnosis And Diagnostic Aids .

Definition, Importance and classification of diagnostic aids
Importance of case history and clinical examinati6n in orthodontics
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
- Definition
- Description and use of cephalostat
- Description and uses of anatomical landmarks lines and angles used in cephalometric analysis
- Analysis- Steiner's, Down's, Tweed's, Ricket's-E- line

Electromyography and its use in orthodontics
Wrist X-rays and its importance in orthodontics

**11. soldering and welding**

**IV YEAR : Teaching Hrs - 30**

1. **General Principles In Orthodontic Treatment Planning Of Dental And Skeletal Malocclusions**

2. **Anchorage in Orthodontics -** Definition, Classification, Types and Stability Of Anchorage

3. **Biomechanical Principles In Orthodontic Tooth Movement**
   Different types of tooth movements
   Tissue response to orthodontic force application
   Age factor in orthodontic tooth movement

4. **Preventive Orthodontics**
   - Definition
   - Different procedures undertaken in preventive orthodontics' and their limitations.

5. **Interceptive Orthodontics**
   - 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

6. **Corrective Orthodontics**
   - Definition, factors to be considered during treatment planning.
   - Model analysis: Pont's, Ashley Howe's, Bolton, Carey's, Moyer's Mixed Dentition Analysis
   - Methods of gaining space in the arch:- Indications, relative merits and demerits of
   - proximal stripping, arch expansion and extractions
   - Extractions in Orthodontics - indications and selection of teeth for extraction.

7. **Orthodontic Appliances:** General
   - Requisites for orthodontic appliances
   - Classification, indications of Removable and Functional Appliances
   - Methods of force application
   - Materials used in construction of various orthodontic appliances - use of stainless steel,- technical considerations in curing of acrylic, Principles of welding and soldering, fluxes and ant fluxes.
   - Preliminary knowledge of acid etching and direct bonding.
   - REMOVABLE ORTHODONTIC APPLIANCES
     - Components of removable appliances
     - Different types of clasps and their use

- Different types of labial bows and their use
- Different types of springs and their use
- Expansion appliances in orthodontics:
  - Principles
  - Indications for arch expansion
  - Description of expansion appliances and different types of expansion devices and their uses.
  - Rapid maxillary expansion

- **FIXED ORTHODONTIC APPLIANCES**
  - Definition, Indications & Contraindications
  - Component parts and their uses
  - Basic principles of different techniques: Edgewise, Begg straight wire.

- **EXTRAORAL APPLIANCES**
  - Headgears
  - Chin cup
  - Reverse pull headgears

- **MYOFUNCTIONAL APPLIANCES**
  - Definition and principles
  - Muscle exercises and their uses in orthodontics
  - Functional appliances:
    - Activator, Oral screens, Frankel's function regulator, Bionator twin blocks, lip bumper
    - Inclined planes - upper and lower

**8. Orthodontic Management Of Cleft Lip And Palate**

**9. Principles Of Surgical Orthodontics Brief knowledge of correction of:**

- Mandibular Prognathism and Retrognathism
- Maxillary Prognathism and Retrognathism
- Anterior open bite and deep bite
- Cross bite

**10. Principle, Differential Diagnosis & Methods of Treatment of:**

- Midline diasthema
- Cross bite
- Open bite
- Deep bite
- Spacing
- Crowding
- Class II - Division 1, Division 2
- Class III Malocclusion - True and Pseudo Class III

## 11. Retention and Relapse

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

## CLINICALS AND PRACTICALS IN ORTHODONTICS

### PRACTICAL TRAINING DURING II YEAR B.D.S. Teaching Hrs - 36

### I. Basic wire bending exercises Gauge 22 or O.7mm

Straightening of wires (4 No,)
Bending of a equilateral triangle
Bending of a rectangle
Bending of a square
Bending of a circle
Bending of U.V.

### II. Construction of Clasps (Both sides upper/lower) Gauge 22 or O.7mm

3/4 Clasp (C-Clasp)
Full Clasp (Jackson's Crib)
Adam's Clasp
Triangular Clasp

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

Finger Spring
Single Cantilever Spring
Double Cantilever Spring (Z-Spring)
T-Springs on premolars

### IV. Construction of Canine retractors Gauge 23 or 0.6mm

U - Loop canine retractor
(Both sides on upper & lower)
Helical canine retractor
(Both sides on upper & lower)
Buccal canine retractor:
Self supported buccal canine retractor with
Sleeve - 5mm wire or 24 gauge
Sleeve - 19 gauge needle on anyone side.
4. Palatal canine retractor on upper both sides Gauge 23 or 0.6mm

### V. Labial Bow

Gauge 22 or 0.7mm
One on both upper and lower

**CLINICAL TRAINING DURING III YEAR B.D.S.** **Teaching Hrs -70**

| *NO.* | *EXERCISE* |
|---|---|
| 01 | Making upper Alginate impression |
| 02 | Making lower Alginate impression |
| 03 | Study Model preparation |
| 04 | Model Analysis :<br>Pont's Analysis<br>Ashley Howe's Analysis<br>Carey's Analysis<br>Bolton's Analysis<br>Moyer's Mixed Dentition Analysis |
| 05 | Basic soldering exercise |

**CLINICAL TRAINING DURING IV YEAR B.D.S.** **Teaching Hrs - 130**

| *NO.* | *EXERCISE* |
|---|---|
| 01 | Case History taking |
| 02 | Case discussion |
| 03 | Discussion on the given topic |
| 04 | Cephalometric tracings<br>I. Down's Analysis<br>II. Steiner's Analysis<br>III. Tweed's Analysis<br>IV. Digital cephalometric tracing |

**PRACTICAL TRAINING DURING IV YEAR B.D.S.**

I. Adam's Clasp on Anterior teeth Gauge 0.7mm

II. Modified Adam's Clasp on upper arch Gauge 0.7mm

III. High Labial bow with Apron spring on upper arch

IV. (Gauge of Labial bow - 0.9mm, Apron spring - 0.3mm)
Coffin spring on upper arch Gauge I mm

**Appliance Construction in Acrylic**

I. Upper & Lower Hawley's Appliance

II. Upper Hawley's with Anterior bite plane

III. Upper Habit breaking Appliance

IV. Upper Hawley's with Posterior bite plane with 'Z' Spring

V. Construction of Activator

VI. Lower inclined plane/Catalan's Appliance

VII. Upper Expansion plate with Expansion Screw

## RECOMMENDED AND REFERENCE BOOKS

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

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION 90 Marks**

| | |
|---|---|
| Clinical discussion (on patient or study models) | 40 Marks |
| Spotters – 10 numbers (2 Marks each) | 20 Marks |
| Wire bending exercise | 30 Marks |

- Clasps
- Sprigs
- Canine retractors
- Labial bows

# PERIODONTICS

**Objective:**

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.

**Third year** **Teaching Hrs - 30**

| Sl. No. | topic | No.of theory hours |
|---|---|---|
| 1. | **Introduction:** Definition of Periodontology, Periodontics, Periodontia, Brief historicalbackground, Scope ofPeriodontics. | 1 |
| 2. | **Development of perio-dontal tissues,** Micro-structural anatomy and biology of periodontal tissues in detail Gingiva. Junctional epithelium in detail, Epithelial-Mesenchymal interaction .Periodontal ligament, Cementum, Alveolar bone. | 4 |
| 3. | **Defensive mechanisms in the oral cavity:** Role of Epithelium, Gingival fluid, Saliva and other defensive mechanisms in the oral environment. | 1 |
| 4. | **Age changes in periodontal structures and their significance in geriatric dentistry** Age changes in teeth and periodontal structures and their association with periodontal diseases | 1 |
| 5. | **Classification of periodontal diseases** Need for classification, scientific basis for classification Classification of gingival and periodontal as described in world workshop 1989 Gingivitis: Plaque associated, ANUG, Steroid hormone influence, Medication influenced, Desquamative gingivitis, other forms of gingivitis as in nutritional deficiency bacterial and viral infections etc. Periodontitis:Adult periodontitis, Rapidly progressive | 1 |

| | | |
|---|---|---|
| | periodontitis A&B, Juvenile periodontitis(localized, generalized and post-juvenile). Prepubertal periodontitis Refractory periodontitis | |
| **6.** | **Gingival Diseases**<br>a. Localised and generalized gingivitis, Papillary,marginal and diffuse gingivitis.<br>b. Aetiology, pathogenesis, clinical signs, symptoms and management of Plaque associated gingivitis.<br>c. Systemically aggravated gingivitis (sex hormones, drugs and systemic diseases)<br>d. ANUG<br>e. Desquamative gingivitis Gingivitis associated with lichen planus, pemphigoid, pemphigus, and other vesiculobullous lesions<br>f. Allergic Gingivitis<br>g. Infective Gingivitis-Herpetic, Bacterial and fungal.<br>h. Pericoronitis<br>i. Gingival Enlargement (Classification and differential diagnosis ) | 1<br>1<br>1<br>1<br>1<br>1<br>1<br>1<br>1 |
| **7.** | **Epidemiology of periodontal diseases-**<br>Definition of index, incidence, prevalence epidemiology, endemic ,epidemicand pandemic.<br>Classification of indices (Irreversible and reversible)<br>Deficiencies of earlier indices used in periodontics<br>Detailed understanding of Sillness & Loe Plaque index , Loe & Silness Gingival Index, CPITN & CPI.<br>Prevalence of periodontal diseases in India and other countries.<br>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. | 1 |
| **8.** | **Etiology-**<br>**Dental Plaque (Biofilm)**<br>Definition, new concept of biofilm Types, composition, bacterial colonization, growth, maturation &disclosing agents. Role of dental plaque in periodontal diseases. Plaque microorganisms in detail and bacteria associated with periodontal diseases. Plaque retentive factors. Materia alba Food debris<br>**Calculus** | 3 |

| | | |
|---|---|---|
| | DefinitionTypes, composition, attachment, theories of formation<br>Role of calculus in disease<br>**Habits**<br>Their periodontal significance<br>Bruxism & parafunctional habits, tongue thrusting, lip biting, occupational habits<br><br>**Iatrogenic Factors;**<br>Conservative Dentistry<br>Restorations Contact point, marginal ridge, surface, roughness,<br>overhanging restorations, interface between restoration and teeth<br><br>Prosthodontics<br>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.<br>Orthodontics<br>Interrelationship, removable appliances & fixed appliances<br>Retention of plaque, bacterial changes<br><br>**Systemic diseases**<br>Diabetes, sex hormones, nutrition (Vit.C & proteins)AIDS & periodontium Haemorrhagic diseases, Leukemia, clotting factor<br><br>disorders, PMN disorders | 1<br><br>1<br><br>2<br><br>2 |
| **9.** | **Diagnosis**<br><br>Routine procedures, methods of probing, types of probes,(According to case history) | 1 |
| **10.** | **Halitosis:**<br><br>Aetiology and treatment.<br><br>Mention advanced diagnostic aids and their role in brief. | 1 |
| **11** | **Prognosis**<br>Definition, types, purpose and factors to be taken in to consideration | 1 |
| **12** | **Treatment plan**<br>Factors to be considered | 1 |

**TUTORIALS DURING CLINICAL POSTING;** **Teaching Hrs - 70**

1. Infection control
2. Periodontal instruments
3. Chair position and principles of instrumentation
4. Maintenance of instruments (sharpening)
5. Motivation of patients- oral hygiene instructions

**DEMONSTRATIONS:**

1. Methods of using various scaling and surgical instruments
2. Polishing the teeth
3. Demonstration to patients ;about different oral hygiene aids

**FORTH YEAR** **Teaching Hrs - 50**

| No | Topic | No of theory hours |
|---|---|---|
| 1 | **Extension of inflammationfrom gingiva**<br>Mechanism of spread of inflammation from gingival area to deeper periodontal structures<br>Factors that modify the spread | 1 |
| 2 | **Pockets;**<br>Definition, signs and symptoms, classification, pathogenesis, histopathology, root surface changes and contents of the pocket | 2 |
| 3 | **Food Impaction**<br>Definition Types, AetiologyHirschfelds' classification Signs & symptoms & squeal of treatment | 1 |
| 4 | **Trauma from occlusion and pathologic migration**<br>Definition, Types Histopathological changesRole in periodontal disease Measures of management in brief | 2 |
| 5 | **Host response** Mechanism of initiation and progression of Periodontal diseases Basic concepts about cells, Mast cells, neutrophils, macrophages, lymphocytes, immunoglobulins, complement system, immune mechanisms & cytokines in brief Stages in gingivitis-Initial, early, established & advanced Periodontal disease activity, continuous paradigm random burst & asynchronous multiple burst hypothesis | 4 |
| 6 | **Periodontitis**<br>Aetiology, histopathology, clinical signs & symptoms, diagnosis and treatment of adult periodontitis<br><br>Periodontal abscess; definition, classification, pathogenesis, differential diagnosis and treatment | 2<br><br>1 |

| | | |
|---|---|---|
| | Furcation involvement, Glickmans classification, prognosis and management<br><br>Rapidly progressive periodontitis Juvenile periodontitis: Localised and generalised Post-juvenile periodontitis<br><br>Periodontitis associated with systemic diseases Refractory periodontitis | <br><br>2<br><br>2 |
| 7 | **Risk factors**<br>Definition, Risk factors for periodontal diseases | 1 |
| | **Periodontal therapy**<br>**A. General principles of periodontal therapy**.<br>Phase I, II, III, IV therapy.<br>Definition of periodontal regeneration,<br>Repair, new attachment and reattachment.<br><br>**B. Plaque control**<br>Mechanical tooth brushes, interdental cleaningAids, dentifrices<br>Chemical; classification and mechanism of action of each & pocket irrigation | <br><br><br><br>1<br><br><br>2 |
| 8 | **Pocket eradication Procedures**<br>**Scaling and root planning:** Indications Aims & objectives Healing following root planning Hand instruments, sonic, ultrasonic & piezo-electric scalers<br>**Curettage & present concepts:** Definition, Indications, Aims & objectives Procedures & healing response<br><br>**Gingivectomy:** Definition, Indications, Aims & objectives Procedures & healing response<br><br>**Flap surgery:** Definition, Types of flaps, Design of flaps, papilla preservation, Indications & contraindicationsArmamentarium, Surgical procedure & healing response<br><br>**Osseous Surgery:** Osseous defects in periodontal disease DefinitionClassification<br>Surgery: resective, additive osseous surgery (osseous grafts with classification of grafts) Healing responses<br><br>Other regenerative procedures; root conditioning Guided tissue regeneration<br><br>**Mucogingival surgery and periodontal plastic gingival surgeries**; Definition Mucogingival problems: etiology, classification of recession (P.'D.Miller Jr. and Sullivan and Atkins) Indications & objectives Gingival extension procedures:lateral pedicle graft, frenectomy, | 2<br><br><br><br>1<br><br>1<br><br>2<br><br>1<br><br>2<br><br>2<br><br>3 |

| | | |
|---|---|---|
| | frenotomy. Crown lengthening procedures Periodontal microsurgery in brief | |
| 9 | **Splints**<br>Periodontal splints-Purpose & classification, Principles of splinting | 1 |
| 10 | **Hypersensitivity**<br>Causes, Theories & management | 1 |
| 11 | **Implants**<br>Definition, types, scope & biomaterials used. Periodontal considerations: such as implant-bone interface, implant-gingiva interface, implant failure, peri-implantitis andmanagement. | 4 |
| 12 | **Maintenance phase (SPT)**<br>Aims, objectives, and principles, Importance Procedures-Maintenance of implants | 1 |
| 13 | **Pharmaco-therapy**<br>Periodontal dressings, Antibiotics & anti-inflammatory Drugs, Local drug delivery systems | 1 |
| 14 | **Periodontal management of medically compromised patients** | 2 |
| 15 | **Inter-disciplinary care**<br>Pulpo-periodontal involvement -Routes of spread of infection Simons' classification -Management | 2 |
| 16 | **Periodontal medicine**<br>Systemic effects of periodontal diseases Cardiovascular diseases, Low birth weight babies etc. | 1 |
| 17 | **Infection control protocol;**<br>Sterilisation and various aseptic procedures | 1 |
| 18 | **Ethics** | 1 |

**TUTORIALS DURING CLINICAL POSTING; Teaching Hrs - 130**

1 Ultrasonic, Piezoelectric and sonic scaling- demonstration of technique
2 Diagnosis of periodontal disease and determination of prognosis
3 Radiographic interpretation and lab investigations

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

**DEMONSTRATIONS:**

History taking and clinical examination of the patients
Recording different indices
Bacterial smear taking
Surgical procedures- gingivectomy, gingivoplasty, and flap operations
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 Assistance in periodontal surgery - 5 cases
3. A work record should be maintained by all the students and should be submitted at the time of examination after due certification from the head of the department.

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

**Prescribed book: Carranza**

**Referrence books:**

Essentials of Periodontology and periodontics-Torquil MacPhee

Contemporary Periodontics-Cohen

Periodontal therapy-Goldman

Orban's periodontics-Orban

Oral health survey-WHO

Preventive periodontics-Young and Stiffler

Public health dentistry-Slack

Advanced periodontal disease-John Prichard

Preventive dentistry-Forrest

Clinical periodontology-Jan Lindhe

Periodontics-Baer & Morris

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION** **90 Marks**

- clinical case history 30 + clinical work 60
  (oral Prophylaxis)

# PROSTHODONTICS AND CROWN & BRIDGE

## GOALS & OBJECTIVES

**At the end of the final year, the student should be skillful & brave enough to,**

- Understand the basics steps in fabricating complete dentures.
- To learn and perform laboratory and clinical steps in fabricating complete denture.
- To learn and perform laboratory and clinical steps in fabricating removable partial denture.
- To know the importance and application of cast partial denture treatment option among partially edentulous arches.
- To know the fundamental and basic principles of tooth preparation.
- To know the need of implant supported prosthesis.
- To applicate the concepts of maxillofacial Prosthodontics.

## COURSE CONTENTS –

**Theory Classes During Third Year** **Teaching Hrs- 30**

| NO. | TOPIC | IMPORTANCE | HOURS |
|---|---|---|---|
| 1 | **COMPLETE DENTURE:**<br>Applied anatomy and physiology<br>a. Introduction<br>b. Biomechanics of the edentulous state<br>c. Residual ridge resorption | Must know | 2 |
| 2 | Communicating with the patient understanding the patients.<br>- Mental attitude | Must know | 1 |
| 3 | Examination, diagnosis and treatment planning and evaluation of diagnostic data.<br>a) With some teeth remaining<br>b) With no teeth remaining<br>c) Systemic status<br>d) Local factor<br>e) The geriatric patient<br>f) Diagnostic procedure | Must know | 2 |
| 4 | Introduction – Removable partial denture.<br>a) Terminologies and scope | Must know | 1 |
| 5 | Classification of RPD | Must know | 1 |
| 6 | Components of a removable partial denture.<br>a) Major connector<br>b) Minor connector<br>c) Rest and rest seats | Must know | 4 |
| 7 | Components of a removable partial denture.<br>a) Direct retainers<br>b) Indirect retainers | Must know | 4 |

| | | | |
|---|---|---|---|
| | c) Tooth replacement | | |
| 8 | Principle of removable partial denture. | Must know | 2 |
| 9 | Surveying and design<br>a) Surveyors<br>b) Surveying<br>c) designing | Must know | 2 |
| 10 | Mouth preparations and master cast | Must know | 2 |
| 11 | Impression materials and procedure for removable partial denture. | Must know | 2 |
| 12 | Jaw relation and aesthetic try in | Must know | 2 |
| 13 | Laboratory procedure | Must know | 2 |
| 14 | Completion of the partial denture | Must know | 1 |
| 15 | Inserting of removable partial denture | Must know | 1 |
| 16 | Post insertion observations. | Must know | 1 |

The above mentioned topics are dealt with wherever appropriate in the following order so as to cover – Definition

- Types / classification
- Materials
- Methodology
- Advantages and disadvantages
- Indications and contraindication
- Maintain phase.

## CLINICAL /PRACTICAL EXERCISES DURING THIRD YEAR

**Teaching Hrs-70**

- During this period each student supposes to complete three acrylic removable partial dentures.

## Theory Classes During Fourth Year

**Teaching Hrs - 80**

| NO. | TOPIC | IMPORTANCE | HOURS |
|---|---|---|---|
| 1 | Improving the patients denture foundation and ridge relation – an over view<br>- Pre operative examination<br>- Initial hard tissue and soft tissue procedure<br>- Secondary hard tissue & soft tissue procedure<br>- Implant procedure<br>- Congenital deformities.<br>- Postoperative procedure | Must know | 2 hours |

| | | | |
|---|---|---|---|
| 2 | Principles of retention, support and stability | Must know | 2 hours |
| 3 | Impression – detail.<br>- Muscles of experission.<br>- Biologicl considerations for maxillary and mandibular impression including anatomy landmark and their interpretation.<br>- Impression objectives<br>- Impression materials.<br>- Impression technique<br>- Impression procedure for both maxillary and mandibular<br>- Preliminary impression and final impressions | Must know | 8 hours |
| 4 | Biological consideration in jaw relation & jaw movements – craniomandibular relations.<br>- Mandibular movements.<br>- Maxillomandibular relation including vertical and horizontal relations.<br>- Concepts of occlusion – discuss in brief | Must know | 3 hours |
| 5 | Relating the patient to the articulator<br>- Face bow types and uses – discus in brief<br>- Face bow transfer procedure – discuss in brief | Must know | 1 hour |
| 6 | Recording maxillomandibular relation.<br>- Vertical relations<br>- Centric relation records.<br>- Eccentric relation record<br>- Lateral relation record | Must know | 2 hours |
| 7 | Tooth selection and arrangement<br>- Anterior teeth<br>- Posterior teeth<br>- Esthetic and functional harmoney | Must know | 2 hours |
| 8 | Relating the inclination of teeth to concept of ocllsion –in brief<br>- Neutrocentric concept<br>- Balanced Occlusal concept | Must know | 2 hours |
| 9 | Trial dentures | Must know | 1 hours |
| 10 | Denture insertion;<br>- Insertion procedures<br>- Clinical errors<br>- Correcting Occlusal disharmony<br>- Selective grinding procedure | Must know | 1 hours |
| 11 | Treating Problems With Associated Denture Use. | Must know | 2 hours |
| 12 | Treating Abused Tissues - Discuss In Brief | Must know | 2 hours |

| | | | |
|---|---|---|---|
| 13 | Relining and rebasing of dentures | Must know | 2 hours |
| **FIXED PARTIAL DENTURE** | | | |
| 1 | Fundamentals of occlusion - in brief | Must know | 1 |
| 2 | Treatment planning for single tooth restorations. | Must know | 1 |
| 3 | Treatment planning for the replacement of missing teeth including selection and choice of abutment teeth. | Must know | 1 |
| 4 | Fixed partial denture configuration | Must know | 1 |
| 5 | Principles of tooth preparations. | Must know | 2 |
| 6 | Preparation of full veneer crowns – in detail | Must know | 1 |
| 7 | Preparation of partial veneer crowns – in brief | Must know | 1 |
| 8 | Provisional restorations. | Must know | 1 |
| 9 | Fluid control and soft tissue management | Must know | 1 |
| 10 | Impression materials & procedure in FPD | Must know | 1 |
| 11 | Working cast & dies | Must know | 1 |
| 12 | Wax patterns | Must know | 1 |
| 13 | Pontics and edentulous ridges | Must know | 2 |
| 14 | Aesthetic considerations | Must know | 2 |
| 15 | Finishing and cementation | Must know | 1 |
| 16 | Resin bonded fixed partial dentures | Must know | 1 |
| 17 | Preparation for periodontally weakened teeth | Must know | 1 |
| 18 | Preparation for extensively damaged teeth | Must know | 1 |
| 19 | Preparation for intracoronal restoration | Must know | 1 |
| 20 | All ceramic restoration | Must know | 2 |
| 21 | Metal – ceramic restorations | Must know | 1 |
| 22 | Solder joints and other connectors | Must know | 1 |
| 23 | The functional generated path technique | Must know | 1 |
| 24 | Introduction and scope of aesthetic dentistry | Must know | 1 |
| 25 | Anatomy and physiology of smile | Must know | 2 |
| 26 | Role of the color in aesthetic dentistry | Must know | 2 |
| 27 | Simple procedure – (roundening of central incisors to enhance esthetic appearance) | Must know | 1 |
| 28 | Veneers with various materials | Must know | 1 |
| 29 | Maxillofacial prosthesis – in brief | Must know | 3 |
| 30 | Dental implants - | Must know | 2 |
| 31 | Repair of dentures | Must know | 1 |
| 32 | Immediate dentures | Must know | 2 |
| 33 | Single complete denture – discuss in brief. | Must know | 1 |
| 34 | Overdenture. | Must know | 2 |
| 35 | Temporary acrylic partial dentures | Must know | 2 |
| 36 | Immediate removable partial dentures. | Must know | 2 |
| 37 | Removable partial dentures opposing complete denture. | Must know | 1 |

**Note :**

The above mentioned topics are dealt with wherever appropriate in the following order so as to cover – Definition

- Types / classification
- Materials
- Methodology
- Advantages and disadvantages
- Indications and contraindication
- Maintain phase.

## CLINICAL /PRACTICAL EXERCISES DURING FOURTH YEAR

**Teaching Hrs - 300**

- During this period each student supposes to complete 3 acrylic conventional complete dentures.
- Each student will be trained to prepare teeth on models to receive various restorations.
- Typhodont tooth preparation - Exercise of making provisional restoration for porcelain jacket crown

## CLINICAL / PRACTICALUNIVERSITY EXAMINATION 90 Marks

**1. SPOTTERS = 10 marks**
**2. PRACTICALS = 80 marks**

**i. Exercise No.1:**

**Diagnosis and Treatment Plan - 20 Marks**

Clinical Patients treated with porstheses – Complete Denture (CD), Removable partial Denture (RPD), Fixed partial Denture (FPD) & Maxillo-facial prosthesis will be kept as spotters.

Candidate will pick the lot and examine the patient for a given problem of the patient.

The candidate shall examine the patient and identify the problem and treatment plan and methods.

**ii. Exercise No.2**

**Final impression for an edentulous patient –**

**Maxillary or mandibular**

1. Peripheral moulding - 15 Marks
2. Impression - 15 Marks **TOTAL – 30 marks**

**iii. Exercise No. 3**
Preparation of the tooth to receive all porcelain or metal ceramic crown (on phantom head) - **20 marks**

**iv. Exercise No. 4**
Designing on the master cast for a RPD frame work. – **10 marks**

**LEARNING SOURCES FOR STUDENTS**

- Text books
- Reference books
- Practical demonstrations
- Internet sources
- Patients

## SUGGESTIVE REFERENCES


- BOUCHER'S "Prosthodontics Treatment for Edentulous Patients" BY ZARB BOLENDER
- Syllabus of complete denture by HEARTWELL
- Essentials Of Complete Denture Prosthodontics by SHELDON WINKLER
- McCRACKEN'S Removable Partial Prosthodontics.
- Removable Partial Prosthodontics By ERNEST L. MILLER
- Clinical Removable Partial Prosthodontics By STEWERT
- Contemporary Fixed Prosthodontics by ROSENSTIEL
- Fundamentals Of Tooth Preparation By SHILLIBERG
- Tylman's Theory & Practice Of Fixed Prosthodontics By MALONE & OTHERS

- Laboratory procedures in complete dentures by RUDD AND MORROW
- Laboratory procedures in removable partial dentures by RUDD AND MORROW
- Maxillofacial Prosthesis By WILLAM R. LANEY
- Contemporary Implant Dentistry by CARL E. MISH
- Osseointegration And Occlusal Rehabilitation By HOBO s , ICHIDA E. AND GARCIA
- Laboratory procedures in fixed partial dentures by RUDD AND MORROW
- Biological considerations in making impressions by BERNARD LEVIN
- Phillips science of dental materials by KENNETH ANUSAVICE
- Aesthetics Of Anterior Fixed Prosthodontics; By CHICHE & PINAULT.
- Aesthetic And The Treatment Of Facial Form, Vol 28; Mc NAMARA

# CONSERVATIVE DENTISTRY AND ENDODONTICS

## Goals:

The dental graduates during training in the institution 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 disease of the teeth, mouth ,jaws and associated tissues.

## Skills

He/she should attain the following skills necessary for practice of dentistry

I. Use medium and high speed hand pieces to carry out restorative work.
II. Use and be familiar with endodontic instruments and materials needed for carrying out simple endodontic treatment.
III. Translate patients aesthetic needs along with function.
IV. Diagnose and manage various common dental problems encountered in general dental practice keeping in mind the expectations and the right of the society to receive the best possible treatment available wherever possible.
V. Prevent and manage complications if encountered while carrying out various surgical and other procedures.
VI. Carry out certain investigative procedures and ability to interpret laboratory findings.
VII. Promote oral health and help prevent oral diseases where possible
VIII. Control pain and anxiety among the people the patients during dental treatment.

## Attitudes:

I. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
II. Willingness to participate in CDE programme to update knowledge and professional skill from time to time.
III. Help and participate in the implementation of the national oral health policy.
IV. He/she should be able to motivate the patient for the proper dental treatment, at the same time proper maintenance of oral hygiene should be emphasised which will help maintain the restorative work and prevent future damage.

## CURRICULUM & SYLLABUS

### THEORY SYLLABUS FOR III YEAR BDS Teaching Hrs - 30

| Sl. no | Topics | Allotted hours |
|---|---|---|
| 1. | Examination, Diagnosis And Treatment Planning | 2 hours |
| 2. | Infection Control – Methods Of Sterilization Of Instruments, Materials And Equipments | 2 hours |
| 3. | Control Of Pain During Operative Procedures | 2 hours |
| 4. | Dental Caries –<br>A. Definition and classification<br>B. Diagnosis<br>C. Management(general)<br>D. Management of deep dental carious lesion(direct and indirect pulp capping) | 3 hours |
| 5. | Contacts And Contours | 2 hours |
| 6. | Isolation Of Operartive Field | 2 hours |
| 7. | Management Of Gingival Tissue During Operative Procedures | 2 hours |
| 8. | Pulpal Reactions Or Response To Operative Procedures And Restorative Materials | 2 hours |
| 9. | Class I Cavity Preparation For Silver Amalgam –<br>A. Instrumentation And Restorative Techniques<br>B. All Designs | 4 hours |
| 10. | Hypersentivity Of Teeth And Management | 2 hours |
| 11. | Diseases Of Pulp –<br>A. Etiology<br>B. Classification<br>C. Clinical Features<br>D. Management | 2 hours |
| 12. | Diseases Of Periapical Tissues –<br>A. Etiology<br>B. Classification<br>C. Clinical Features<br>D. Management | 2 hours |
| 13. | Biocompatibility Of Restorative Materials | 2 hours |
| 14. | Pulp Protection | 1 hours |

### CLINICAL QUOTA FOR III YEAR BDS Teaching Hrs - 70

1. Class I deep caries excavation and restoration with temporary restorative materials – 5.
2. Class I cavity preparation and amalgam restorations – 10.
3. Glass ionomer restorations – 5 .

## ASSSIGNMENTS FOR III YEAR BDS

1. Dental chair.
2. Instrument grasps and finger rests.
3. Sterilization of operative instruments.
4. Dental caries –
    a. Definition
    b. Classification
    c. Diagnosis
5. Direct and indirect pulp capping procedures.
6. Class I cavity designs for silver amalgam and restorative techniques.
7. Isolation techniques.
8. Speed –
    a. Classification – uses of each speed range.
    b. Precautions and protective measures during high speed.

## DEMONSTRATIONS FOR III YEAR BDS

1. Dental chair operations.
2. Chair side positions –

Operator positions

Patient positions

3. Deep caries management under rubber dam isolation.
4. Class I cavity preparation and restoration with silver amalgam.
5. Gingival cord placement followed by glass ionomer restorations of class V cervical lesions.

## THEORY SYLLABUS FOR IV YEAR BDS

## CONSERVATIVE DENTISTRY Teaching Hrs – 80

| Sl.no | Topics | Allotted hours |
|---|---|---|
| 1. | a) Direct tooth colored restorative materials – Composite resin , Glass ionomer cements - Indications, contra-indications, acid etching and dentin bonding systems, tooth preparation, restorative technique, finishing and polishing procedures, recent advances.<br><br>b) Indirect tooth coloured restorations – Indirect composites Introduction, indications, contra-indications, advantages and contraindications | 5 hours |
| 2. | Management Of Non-Carious Lesions | 1 hours |

| | | |
|---|---|---|
| 3. | Silver Amalgam Restorations<br>a. Class II cavity designs<br>b. Pin retained amalgam restorations<br>c. Bonded amalgam restorations<br>d. Mercury hygiene<br>e. Failures of amalgam restorations | 5 hours |
| 4. | Direct Filling Gold –<br>a. Indications and contra-indications<br>b. Cavity designs<br>c. Types of DFG.<br>d. Principles of manipulation, compaction technique<br>e. Finishing and polishing | 2 hours |
| 5 | Gnathological Concepts Of Restorations – Physiology Of Occlusion, Normal Occlusion, Ideal Occlusion, Mandibular Movements, Occlusal Analysis, Occlusal Rehabilitation And Restoration | 2 hours |
| 6 | Cast Gold Restorations –<br>a. Definition for inlay and onlay<br>b. Indications and contra-indications<br>c. Class II cavity designs<br>d. Impression techniques<br>e. Lab procedures-wax pattern, spruing, investing, casting<br>f. Seating, adjusting and polishing<br>g. Cementation<br>h. Casting defects – causes and prevention | 5 hours |
| 7 | Principles Of Esthetic Dentistry | 2 hours |
| 8 | Tooth colored inlays and onlays –<br><br>Clinical procedures for CEREC and CAD CAM | 2 hours |
| 9 | Ceramic Veneers(In Brief) | 1 hours |
| 10 | Lasers In Conservative Dentistry And Endodontics | 2 hours |

## ENDODONTICS

| Sl.no | Topics | Allotted hours |
|---|---|---|
| 1. | Definition, Aim And Scope Of Endodontics | 1 hours |
| 2. | Rationale And Principles Of Endodontics | 3 hours |
| 3. | Clinical Diagnostic Methods | 2 hours |
| 4. | Endodontic Armamentarium –<br><br>a. Instrument classification<br>b. Standardization<br>c. Sterilization | 3 hours |
| 5. | Case Selection And Treatment Planning | 2 hours |
| 6. | Anatomy Of Pulp Space | 2 hours |
| 7. | Endo-Perio Lesions – Classification And Management | 2 hours |
| 8. | Discoloration of teeth –<br><br>Etiology<br><br>Classification<br><br>Management | 2 hours |
| 9 | Access Opening And Its Principles | 2 hours |
| 10 | Determination Of Working Length | 2 hours |
| 11 | Preparation Of Root Canal – Cleaning And Shaping(Rules And Techniques), endodontic mishaps | 5 hours |
| 12 | Root Canal Irrigants | 1 hours |
| 13 | IntraCanal Medicaments | 1 hours |
| 14 | Root Canal Microflora and culture techniques. | 2 hours |
| 15 | Root Canal Obturation – Obturation Materials And Techniques | 3 hours |
| 16 | Post Endodontic Restoration | 2 hours |
| 17 | Traumatic Teeth Classification And Management | 2 hours |
| 18 | Endodontic Emergencies And Management | 2 hours |
| 19 | Endodontic Surgeries | 5 hours |
| 20 | Root Resorption | 2 hours |
| 21 | Smear Layer | 1 hour |
| 22 | Apexification And Apexogenesis | 1 hour |
| 23 | Use Of Microscopes In Endodontics In Brief | 1 hour |

## CLINICAL QUOTA FOR IV YEAR Teaching Hrs - 300

1. Management of class II deep carious lesion, restorations with temporary cement – 5 cases.
2. Class II cavity preparation and restoration with silver amalgam –20 cases.
3. Glass ionomer restorations – 5 cases.
4. Composite resin restorations – class III, class IV and class V restorations – 5 cases.
5. Anterior RCT on extracted teeth – 2 cases.
6. Class I and class II composite resin restorations – 5 cases
7. Anterior RCT – 2 cases.

## ASSIGNMENT FOR IV YEAR

1. Class II cavity design for silver amalgam restoration.
2. Class III and class IV cavity preparation and restorations with composite resins.
3. Class V cavity preparation and restoration with GIC.
4. Diagnostic aids in endodontics.
5. Endodontic Instruments –
    a. Classification
    b. Standardization
    c. Explanation of individual instruments with uses
    d. Sterilization

## DEMONSTRATIONS FOR IV YEAR

1. Composite resin restorations for anterior teeth.
2. Anterior and posterior RCT - (access opening and working length determination).

## Recommended Books

- Principles and Practice of operative Dentistry by Charbeneau, 3rd Ed
- Endodontics by John.I Ingle 4th Ed.
- Endodontic practice by Louis. J Grossman 2nd Ed.
- Sturdevant's Art and Science of Operative Dentistry by Theodorne M Roberson, 5th Ed.
- Pathways of Pulp by Cohen, 5th Ed.

## CLINICAL / PRACTICALUNIVERSITY EXAMINATION 90 Marks

1. Preparation of Class II Cavity for Silver Amalgam in a molar tooth and restoration.

Or

2. Preparation of Access Cavity for Root Canal Treatment in an Anterior Tooth followed by working length determination, biomechanical preparation and Master cone selection.

## Details of Marks Distribution of the Practical Examination :-

1. Conservative Exercise

Class II Cavity Preparation 40 marks

Base and matrix - 20 marks

Filling with silver amalgam and carving - 30 marks

Total 90 marks

Or

2. Endodontic Exercise :

Access cavity 30 marks

Working length determination - 20 marks

Bio – mechanical Preparation and

Master cone selection. 40 marks

Total 90 marks

# ORAL & MAXILLOFACIAL SURGERY

**Aim of the Course:**

"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 inpatient management of maxillofacial problems".

**Objective :**

**a. Knowledge and 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 patient to have oral surigical specialist opinion or treatment.
5. Understand the principles of in-patient management.
6. Understand 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.

**Syllabus :**

**THIRD YEAR BDS SYLLABUS:**

**THEORY** **Teaching Hrs - 20**

**1.TRIGEMINAL NERVE** : Detailed Anatomy and its applied aspects

**2.Diagnosis in oral surgery**:

(A) history taking (B) Clinical examination (C) Investigations

Principles of infection control and cross-infection control with particular reference to HIV/AIDS and Hepatitis.

**3.Principles of Oral Surgery -**

a) Asepsis: Definition, measures to prevent infection during surgery.

1. Preparation of the patient
2. Measures to be taken by operator
3. Sterilisation of instruments - various methods of sterilisation etc.
4. Surgery set up.

b)Painless Surgery:

1. Pre- anaesthetic considerations

Pre-medication: purpose, drugs used

2. Anaesthetic considerations -

a) Local b) Local with IV sedations

3. Use of general anaesthetic

c) Access:

Intra-oral: Mucoperiosteal flaps, principles, commonly used intra oral incisions.

Bone Removal: Methods of bone removal.

Use of Burs: Advantages & precautions

Bone cutting instruments: Principles of using chisel & osteotome.

Extra-oral: Skin incisions - principles, various extra-oral incision to expose facial skeleton.

a) Submandibular b) Pre auricular

b) Incision to expose maxilla & orbit

c) Bicoronal incision

d) Control of haemorrhage during surgery

Normal Haemostasis

Local measures available to control bleeding

Hypotensive anaesthesia etc.

e) Drainage & Debridement

Purpose of drainage in surgical wounds

Types of drains used

Debridement: purpose, soft tissue & bone debridement.

f) Closure of wounds

Suturing: Principles, suture material, classification, body response to variousmaterials etc.

g) Post operative care

Post operative instructions

Physiology of cold and heat

Control of pain - analgesics

Control of infection - antibiotics

Control of swelling - anti-inflammatory drugs

Long term post operative follow up - significance.

## 4.LOCAL ANAESTHESIA

Introduction.
Properties of an ideal local anaesthetic drug.
Properties of common local anaesthetic drugs in use.
Choice of anaesthesia – local or general
Indications and contra indications, advantages and disadvantages of local
anaesthesia
Components of a standard local anaesthetic solution and the part played by eachcomponent
Mechanism of local anaesthetics.
Pharmacodynamics of local anaesthetic agents.
Preanaesthetic medication
Technique of infiltration anaesthessia, Nerve block anaesthesia. Symptoms andsigns of anaesthesia,
Complications associated with local anaesthesia and their management.

## 5.GENERAL ANAESTHESIA

Properties of general anaesthetic drugs commonly used
Pre-anaesthetic preparation of patient and premedication
Evaluation of a patient for general Anaesthesia
Short Anaesthesia in a Dental Chair Endotracheal anaesthesia, Intravenous
Anaesthesia
Symptoms and signs of general Anaesthesia
Complications arising during the administration of general Anaesthesia and theirmanagement
Hypotensive Anaesthesia

## 6.EXODONTIA:

Objectives
Indications for tooth extraction
Pre-operative assessment
Principles of Elevators
Forceps extraction
Surgical extraction (Trans – alveolar extraction)
Extraction technique under general Anaesthesia in the Dental chair
Complications of tooth extraction and their management
Principles of Suturing techniques.
Minor surgery.

## CLINICALS: Teaching Hrs - 90

Case History taking
Administration of local anaesthesia: Various techniques
Extraction of Periodontally weak teeth: 5 cases
Different type of Suturing techniques performing on dummy models.
Different type of Wiring techniques performing on dummy models.

## FOURTH YEAR BDS SYLLABUS:

**THEORY:** **Teaching Hrs - 50**

1.Impacted teeth:

Incidence, definition, aetiology.

a Impacted mandibular third molar.

b Classification, reasons for removal
Assessment - both clinical & radiological

c Surgical procedures for removal.
Complications during and after removal,

d Prevention and management.

e Mandibular andMaxillary third molar,
Indications for removal, classification,
Surgical procedure for removal.

(f) Impacted maxillary canine
Reasons for canine impaction,
Localization, indications for removal,
Methods of management, labial and palatal approach,
Surgical exposure, transplantation, removal etc.

2. Pre-prosthetic Surgery:

Definition, classification of procedures

(a) Corrective procedures: Alveoloplasty,
Reduction of maxillary tuberosities,
Frenectomies and removal of tori.

(b) Ridge extension or Sulcus extension procedures
Indications and various surgical procedures

(c) Ridge augmentation and reconstruction.
Indications, use of bone grafts,
Hydroxyapatite
Implants - concept of osseo integration
Knowledge of various types of implants andsurgical procedure to place implants.

3. Diseases of the maxillary sinus

Surgical anatomy of the sinus.
Sinusitis both acute and chronic
Surgical approach of sinus - Caldwell-Luc procedure
Removal of root from the sinus.
Oro-antral fistula - aetiology, clinical features and various surgical methods for closure.

4. Benign cystic lesions of the jaws -

Definition, classification, pathogenesis.
Diagnosis - Clinical features, radiological, aspiration biopsy, use of contrast media and histopathology.

Management - Types of surgical procedures, Rationale of the techniques, indications, procedures, complications etc.

5. Tumours of the Oral cavity -

General considerations

Non odontogenetic benign tumours occuring in oral cavity - fibroma, papilloma,lipoma, ossifying fibroma, myeloma etc.

Ameloblastoma - Clinical features, radiological appearance and methods of management.

6. Salivary Gland diseases

Diagnosis of salivary gland diseases

Sialography, contrast media procedure

Infections of the salivary glands

Sialolithiasis – Sub mandibular duct and gland and parotid duct.

Clinical features, management.

Salivary fistulae

Common tumours of salivary glands like Pleomorphic adenoma including minor salivary glands.

7. Fractures of the jaws -

General considerations, types of fractures, aetiology, clinical features and general principles of management.

mandibular fractures - Applied anatomy, classification.

Diagnosis - Clinical and radiological

Management - Reduction closed and open

Fixation and immobilisation methods

Outline of rigid and semi-rigid internal fixation.

Fractures of the condyle - aetiology, classification, clinical features, principles of management.

Fractures of the middle third of the face.

Definition of the mid face, applied surgical anatomy, classification, clinical features and outline of management.

Alveolar fractures - methods of management

Fractures of the Zygomatic complex

Classification, clinical features, indications for treatment, various methods of reduction and fixation.

Complications of fractures - delayed union, non-union and malunion.

8.Medical Emergencies in dental practice -

Primary care of medical emergencies in dental practice particularly -

(a) Cardio vascular (b) Respiratory (c) Endocrine

(d) Anaphylactic reaction (e) Epilepsy (f) Epilepsy

9. Emergency drugs & Intra muscular, I.V. Injections -

Applied anatomy, Ideal location for giving these injections, techniques etc.

10.Carcinoma of the oral cavity -

Biopsy - types

TNM classification.

Outline of management of squamous Cell carcinoma: surgery, radiation and chemotherapy

Role of dental surgeons in the prevention and early detection of oral cancer.

11. Jaw deformities – Orthognathic Surgery
    Basic forms - Prognathism, Retrognathism and open bite.
    Reasons for correction.
    Outline of surgical methods carried out on mandible and maxilla.

12. Disorders of T.M. Joint
    Applied surgical anatomy of the joint.
    Dislocation - Types, aetiology, clinical features and management.
    Ankylosis - Definition, aetiology, clinical features and management
    Myo-facial pain dysfunction syndrome, aetiology, clinical features, management -
    Non surgical and surgical.
    Internal derangement of the joint.
    Arthritis of T.M. Joint.

13. Infections of the Oral cavity
    Introduction, factors responsible for infection, course of odontogenic infections, spread of odontogenic infections through various facial spaces.
    Dento-alveolar abscess - aetiology, clinical features and management.
    Osteomyelitis of the jaws - definition, aetiology, pre-disposing factors, classification, clinical features and management.
    Ludwigs angina - definition, aetiology, clinical features, management and Complications.
    Osteoradionecrosis – Prevention and its Managment
14. Neurological disorders -
    Trigeminal neuralgia - definition, aetiology, clinical features and methods of management including surgical.
    Facial paralysis - Aetiology, clinical features.
    Nerve injuries - Classification, neurorhaphy etc.

15. Cleft Lip and Palate -
    Aetiology of the clefts, incidence, classification, role of dental surgeon in the management of cleft patients.
    Outline of the closure procedures.

16.Reconstructive Surgery.
    Types of Bone Grafts.
    Indications and contra-indications.
    Mechanism of Graft acceptance at the recipient site.
    Reasons for Graft failure and its management.

17. Distraction osteogenesis

18. Lasers and cryosurgery in oral & maxillofacial surgery.

19.Principles of Micro-vascular surgery.

**CLINICALS:** **Teaching Hrs - 200**

Discussion Topics:
Trigeminal Nerve anatomy and its applied aspects
Case History Taking and Investigations
Principles of Exodontia
Local Anaesthesia
Extraction: Minimum of 30 cases to be performed.
Suturing to be performed on patients.
Alveolopasties should be performed independently:Minimum of 2 cases to be done
Open method Extracions: Perfomed independently or assistance- Minimum of 2 cases to be done.
Major operative procedures: To be observed- Minimum of 2 cases.

## Recommended Books


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


**CLINICAL / PRACTICAL UNIVERSITY EXAMINATION** **90 Marks**

Case history, examination of the patient, presenting the case history to the examiners at chair side Marks : 25
Local Anaesthesia technique – Marks : 15
Extraction of firm molar, (either maxillary / mandibular) tooth and management of patient – marks : 50

# PUBLIC HEALTH DENTISTRY

**Goal:**

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

**Objectives:**

**Knowledge:** At the conclusion of the course the student shall have a knowledge of the basis of public health, preventive dentistry, public health problems in India, nutrition, environment and their role in health, basics of dental statistics, epidemiological methods, national oral health policy.

**Skill and attitude:** At the conclusion of the course the student shall acquire the skill of identifying health problems affecting the society, conducting health surveys, conducting health education classes and deciding health strategies.

**Communication abilities:** At the conclusions of the course the student should be able to communicate the needs of the community efficiently, inform the society of all the recent methodologies in preventing oral diseases.

**SYLLABUS FOR 4TH B.D.S** **Theory** **Teaching hrs –62**

| Sl No | Topics | Hours allotted |
|---|---|---|
| **1. Introduction to Dentistry** | | |
| i | **Introduction to Dentistry:** Definition of dentistry, History of dentistry, Scope, aims and objectives of Dentistry. | 1 hr |
| **2. Public health** | | |
| i | **Health & disease:** Concepts, Philosophy, Definition and Charecteristics | 3hr |
| ii | **Public health:** Definition & concepts, History of public health. | 1 hr |
| iii | **General epidemiology:** Definitions, objectives & methods. | 5hr |
| iv | **Environmental health:** Concepts, Principles, protection, sources, purification, environmental sanitation of water, Disposal of waste, sanitation, then role in mass disorder | 3hr |
| v | **Health education:** Definition, concepts, principles, methods and health education aids | 2hr |
| vi | **Public Health Administration:** Priority, establishment, manpower, private practice management, hospital management. | 3hr |
| vii | **Ethics and Jurisprudence:** Professional liabilities, negligence, malpractice, consents, evidence, | 2hr |

| | | |
|---|---|---|
| | contracts and methods of identification in forensic dentistry | |
| viii | **Nutrition in Oral Diseases** | 1hr |
| ix | **Behavioural science:** Definition of sociology, anthropology and psychology and their relevance in dental practice and community | 1hr |
| x | **Health care delivery system:** Centre and state, oral health policy, Primary Health Care, National health programmes, Health Organizations | 4hr |
| **3. Dental Public Health** | | |
| 1 | **Dental Public Health:** Definition and difference between community and clinical health | 1hr |
| 2 | **Epidemiology** of dental caries, periodontal diseases, malocclusion, dental fluorosis and oral cancer | 4hrs |
| 3 | **Survey Procedures : Planning, Implementation and evaluation, WHO** Basic oral health survey methods 1997, indices for oral diseases | 3hrs |
| 4 | **Delivery of dental care:** Dental auxiliaries, operational and non-operational, incremental and comprehensive health care, school dental health | 2hr |
| 5 | **Payments in Dental Care: Methods** of payments and dental insurance, Government plans | 2hr |
| 6 | **Preventive dentistry:** Definition, levels, role of individual, community and profession, fluorides in dentistry, plaque control programmes | 8hr |
| **4. Research methodology and Biostatistics** | | |
| 1 | **Health Information:** Basic knowledge of computers, MS Office, Windows 2000, Statistical programmes | 1hr |
| 2 | **Research methodology: Definition, types** of research, designing a written protocol | 1hr |
| 3 | **Biostatistics:** Introduction, collection of data, presentation of data, Measures of central tendencies, Measures of dispersion, Tests of significance, Sampling and sampling techniques-types, errors, Bias blind trials and calibration | 7hr |
| **5. Practice Management** | | |
| 1 | **Practice Management :** Place and locality, Premises and layout, Selection of equipments, Maintenance of records/accounts/audit | 1hr |
| **6. Dentist act 1948 & amendment** | | 1hr |
| **7. Dental Council of India and State Dental Councils** | | 1hr |
| **8. Composition and responsibilities** | | 1hr |
| **9. Indian Dental Association: Head office, State, Local Branches** | | 1hr |

| | |
|---|---|
| 10. Disaster management: Role of dentists/Oral Health Professionals in the management ofpandemics, epidemics and natural disasters | 1hr |
| 11. Policy development to address oral health issues in India The students are introduced to the basic knowledge of policy formulation, development and implementation with examples. Further they are made to understand the policy making process and are asked to frame a policy for one of the issues at hand in our Country. | 1hr |

**Clinical** **Teaching hrs –200**

**Practical /Clinical/Field program in community dentistry:**

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

**Exercises:**

1. Collection of statistical data on population in India, birth rates, morbidity and mortality, literacy, per capita income.
2. Incidence and prevalence of common oral diseases like dental caries, periodontal diseases, oral cancer, fluorosis at national and international levels.
3. Preparation of oral health education material – posters, models, slides, lectures etc.
4. Oral health status assessment of the community using indices and WHO basic oral health survey methods.
5. Exploring and planning setting up of private dental clinics in rural, semi urban and urban locations. Availment of finances for dental practices-preparing project report.
6. Visit to primary health centre – to acquaint with activities and primary health care delivery.
7. Visit to water purification plant/public health laboratory/centre for treatment of sewage water.
8. Visit to schools to assess the oral health status of school children, emergency treatment and health education including possible preventive care at school.
9. Visit to institution for the care of handicapped, physically, mentally or medically compromised patients.
10. Preventive dentistry: in the department application of pit and fissure sealants, fluoride gel application procedure, ART, Comprehensive health 5 patients (at least 2 patients).

**Recommended books& references**


- Dentistry, Dental Practice and community by David F Striffler & Brian A Burt,1983
- Principles of Dental Public Health by James Morse Dunning,IV Edn 1986

- Community Dental Health by Anthony Jong 3rdEdn 1994
- Dental Public Health-An introduction to community dentistry. Edited by Geoffrey L Slack & Brian A Burt 1980
- PreventiveDentistry by Murray,1997
- Fluorides in Dentistry by Frejeskov
- Primary Preventive Dentistry by Norman O Harris ,FranklinGracia-Goody 6th Edn
- Preventive Materials, methods& programmes By PerAxelson I Edn 2004
- Fluorides in Caries Prevention by J J Murray,A JRugg-Gunn,G N Jenkins3rd Edn 1991
- Fluorides in Human Health by WHO Geneva 1970
- Text book of Preventive & Social Medicine by Park 19th Edn
- Epidemiology,biostatistics and preventive medicine by JamesF Jekel ,
- DavidKatz,Joann Elmore 2nd Edn 2001
- Methods in biostatistics byB.K.Mahajan
- Research Methodology by C.R.Kothari

**CLINICAL / PRACTICALUNIVERSITY EXAMINATION** **90 Marks**

1. Oral health assessment using Indics (any 2 indices) (2 X 20) = 40 marks
2. Preventive dentistry procedures (One exercise- Topical Fluoride application or pit and fissure sealant application) = 25 marks
3. Oral health education talk on assigned topic = 25 marks

# AESTHETIC DENTISTRY

Aesthetic Dentistry has gained popularity over the last decade. Therefore it is better that undergraduate students understand the philosophy and scientific knowledge of aesthetic dentistry.

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

**Recommended books:**

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

# FORENSIC ODONTOLOGY

**Definition** **Teaching Hrs - 30**

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

**Objectives of the undergraduate curriculum**

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

1). Have sound knowledge of the theoretical and practical aspects of forensic odontology.
2). Have an awareness of ethical obligations and legal responsibilities in routine practice and forensic casework.
3). Be competent to recognize forensic cases with dental applications when consulted by the police, forensic pathologists, lawyers and associated professionals.
4). Be competent in proper collection of dental evidence to cases of identification, ethnic and sex differentiation, age estimation and bite marks.

5). Be able to assist in analysis, evaluation, and presentation of dental facts within the realm of law.

## Curriculum for Forensic Odontology

### 1. Introduction to forensic dentistry

a. Definition and history
b. Recent developments and future trends

### 2. Overview of forensic medicine and toxicology

a. Cause of death and postmortem changes
b. Toxicological manifestations in teeth and oral tissues

### 3. Dental identification

a. Definition
b. Basis for dental identification
c. Postmortem procedures
d. Dental record compilation and interpretation
e. Comparison of data, and principles of report writing
f. Identification in disasters and handling incinerated remains
g. Postmortem charges to oral structures

### 4. Maintaining dental records

a. Basic aspects of good record-keeping
b. Different types of dental records
    i. Dental charts
    ii. Dental radiographs
    iii. Study casts
    iv. Denture marking
    v. Photographs
c. Dental notations
d. Relevance of dental records in forensic investigation

### 5. Age estimation

a. Age estimation in children and adolescents
    i. Advantages of tooth calcification over 'eruption' in estimating age
    ii. Radiographic methods of Schour & Massler, Demirjian et al
b. Age estimation in adults
    i. Histological methods – Gustafson's six variables and Johanson's modification, Bang & Ramm's dentine translucency
    ii. Radiographic method of Kavaal et al
c. Principles of report writing

### 6. Sex differentiation

a. Sexual dimorphism in tooth dimensions (Odonometrics)

### 7. Ethnic variations ('racial' differences) in tooth morphology

a. Description of human population groups

b. Genetic and environmental influences on tooth morphology
c. Description of metric and non-metric dental features used ethnic differentiation.

**8. Bite mark procedures**

a. Definitions and classification
b. Basis for bite mark investigation
c. Bite mark appearance
d. Macroscopic and microscopic ageing bite marks
e. Evidence collection from the victim and suspect of bite mark
f. Analysis and comparison
g. Principles of report writing
h. Animal bite investigation

**9. Dental DNA methods**

a. Importance of dental DNA evidence in forensic investigations
b. Types of DNA and dental DNA isolation procedures
c. DNA analysis in personal identification
d. Gene-linked sex dimorphism
e. Population genetics

**10. Jurisprudence and ethics**

a. Fundamentals of law and the constitutions
b. Medical legislation and statutes (Dental and Medical Council Acts, etc)
c. Basics of civil law (including torts, contracts and consumer protection act)
d. Criminal and civil procedure code (including expert witness requirement)
e. Assessment and quantification of dental injuries in courts of law
f. Medical negligence and liability
g. Informed consent and confidentiality
h. Rights and duties of doctors and patients
i. Medical and dental ethics (as per Dentists' Act)

Theory sessions and practical exercises

Total hours for the course
Didactic – 10 – 12 hours
Practical – 20 – 25 hours

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

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

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

Approach to teaching forensic odontology.

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

**Preclinical stream**

- Introduction to forensic odontology
- Sex differences in odontometrics
- Ethnic variations in tooth morphology
- Histological age estimation
- Dental DNA methods
- Bite marks procedures
- Overview of forensic medicine and toxicology

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

**Clinical stream**

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

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

# ORAL IMPLANTOLOGY

**Teaching Hrs - 30**

## Introduction

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

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

Criteria for success of osseointegrated implant supported prosthesis

## Suggested Books For Reading


| | | |
|---|---|---|
| Contemporary Implant Dentistry | - | Carl.E.Misch<br>Mosby 1993 First Edition. |
| Osseointegration and Occlusal Rehabilitation | | Hobo S., Ichida. E. and Garcia L. T.<br>QuintessencePublishing Company,<br>1989 First Edition. |

# BEHAVIOURAL SCIENCES

**Teaching Hrs - 20**

## Goal

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

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

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

## Objectives:

### A) Knowledge & Understanding:

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

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

### B) Skills

The student shall be able to:

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

## Integration:

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

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

**Psychology:**

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

**Sociology:**

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

**Reference Books:**

General psychology- S.K Mangal
General psychology – Hans Raj, Bhatia
General psychology – Munn
Behavioural Sciences in Medical practise – Manju Mehta.
Sciences basic to psychiatry- Basanth puri & peter J Tyrer

# ETHICS

**Teaching Hrs - 20**

## Introduction:

There is a definite shift now from the traditional patient and doctor relationship and delivery of dental care. With advances in science and technology and the increasing needs of the patient their families and community, there is a concern for the health of the community as a whole. There is a shift to greater accountability to the society. Dental specialists like other health professionals are confronted with many ethical problems. It is therefore absolutely necessary for each and every one in health care delivery to prepare themselves to deal with these problems. To accomplish this and develop human values the council desires that all the trainees undergo ethical sanitization by lectures or discussion on ethical issues discussion of cases with an important ethical component.

## Course content:

### Introduction to ethics-

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

### Ethics of the individual-

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

### Profession Ethics-

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

### Research Ethics-

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

Ethical workshop of cases
Gathering all scientific factors

Gathering all value factors
Identifying areas of value – setting of priorities
Working our criteria towards decisions

**Recommended Reading:**

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

## CURRICULUM OF DENTAL INTERNSHIP PROGRAMME.
## (As per DENTAL COUNCIL OF INDIARevised Internship Programme, 2011)

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

### Determinants of Curriculum for internship for Dental Graduates:

The curricular contents of internship training shall be based on.

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

### Objectives:

A. To facilitate reinforcement of learning and acquisition of additional knowledge:-
a) Reinforcement of knowledge.
b) Techniques & resources available to the individual and the community; Social
and cultural setting.
c) Training in a phased manner, from a shared to a full responsibility.
B. To facilitate the achievement of basic skills: attaining competence Vs.maintaining
competence in:-
i) History taking.

ii) Clinical Examination.
iii) Performance and interpretation of essential laboratory data.
iv) Data analysis and inference.
v) Communication skills aimed at imparting hope and optimism in the patient.
vi) Attributes for developing working relationship in the Clinical setting and Community team work.
C. To facilitate development of sound attitudes and habits:-
i) Emphasis on individual and human beings, and not on disease/symptoms.
ii) Provision of comprehensive care, rather than fragmentary treatment.
iii) Continuing Dental Education and Learning of accepting the responsibility.
D. To facilitate understanding of professional and ethical principles:-
- Right and dignity of patients.
- Consultation with other professionals and referral to seniors/institutions.
- Obligations to peers, colleagues, patients, families and Community.
- Provision of free professional services in an emergent situation.
E. To initiate individual and group action, leading to disease prevention and dental
health promotion, at the level of individuals families and the community.

**Content (subject matter)**

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

**General Guidelines:**

1. It shall be task-oriented training. The interns should participate in various institutional and field programmes and be given due responsibility to perform the
activities in all departments of the Dental Colleges and associated Institutions.
2. To facilitate achievement of basic skills and attitudes the following facilities should be provided to all dental graduates:

i) History taking, examination, diagnosis, charting and recording treatment plan of cases.
ii) Presentation of cases in a group of Seminar.
iii) Care and sterilization of instruments used.
iv) Performance and interpretation of essential laboratory tests and other relevant investigations.
v) Data analysis and inference.
vi) Proper use of antibiotics, anti-inflammatory and other drugs, as well as other therapeutic modalities.
vii) Education of patients, their relatives and community on all aspects of dental health care while working in the institution as also in the field.
viii) Communication aimed at inspiring hope, confidence and optimism.
ix) Legal rights of patients and obligations of dental graduate under forensic jurisprudence.

1. **Oral Medicine & Radiology:**

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

2. **Oral and Maxillofacial surgery**

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

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

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

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

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

1. **Emergencies.**

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

2. Work in I.C.U. with particular reference to resuscitation procedures.
3. Conduct tutorials on medico-legal aspects including reporting on actual cases coming to casualty. They should have visits to law courts.

3. **Prosthodontics**

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

1. Complete denture (upper & lower) 2
2. Removable Partial Denture 4
3. Fixed Partial Denture 1

4. Planned cast partial denture 1
5. Miscellaneous-like reline/overdenture/repairs of Maxillofacial Prosthesis 1
6. Learning use of Face bow and Semi anatomic articulator technique
7. Crowns
8. Introduction of Implants 1

## 4. **Periodontics**

A. The dental graduates shall perform the following procedures
1. Prophylaxis 15 Cases
2. Flap Operation 2 Cases
3. Root Planning 1 Case
4. Currettage 1 Case
5. Gingivectomy1 Case
6. Perio-Endo cases 1 Case

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

## 5. **Conservative Dentistry**

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

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

## 6. **Pedodontics and Preventive Dentistry**

During their posting in Pedodontics the Dental graduates shall perform:
1. Topical application of fluorides including varnish 5 Cases
2. Restorative procedures of carious deciduous teeth in children. 10 Cases
3. Pulpotomy 2 Cases
4. Pulpectomy 2 Cases
5. Fabrication and insertion of space maintainers 1 Case
6. Oral habit breaking appliances 1 Case

## 7. **Oral Pathology and Microbiology**

The interns shall perform the following:
1. History-recording and clinical examination 5 Cases
2. Blood, Urine and Sputum examination 5 Cases
3. Exfoliative Cytology and smears study 2 Cases
4. Biopsy- Laboratory Procedure & reporting 1 Case

## 8. **Orthodontics**

A. The interns shall observe the following procedures during their posting in Orthodontics:
1. Detailed diagnostic procedures for 5 patients
2. Laboratory techniques including wire-bending for removable appliances, soldering and processing of myo-functional appliances.
3. Treatment planning options and decisions.
4. Making of bands, bonding procedures and wire insertions.
5. Use of extra oral anchorage and observation of force values.
6. Retainers.
7. Observe handling of patients with oral habits causing malocclusions.

The dental graduates shall do the following laboratory work:-
1. Wire bending for removable appliances and space maintainers including weldoing and heat treatment procedure. - 5 Cases
2. Soldering exercises, banding & bonding procedures - 2 Cases
3. Cold-cure and heat-cure acrylisation of simple Orthodontic appliances - 5 Cases

## 9. **Public Health Dentistry**

1. The interns shall conduct health education sessions for individuals and groups on oral health public health nutrition, behavioral sciences, environmental health, preventive dentistry and epidemiology.
2. They shall conduct a short term epidemiological survey in the community, or In the alternate, participate in the planning and methodology.
3. They shall arrange effective demonstrations of:
a4. Conduction of oral health education programmes at
A) School setting 2
B) Community setting 2
C) Adult education programmes 2
5. Preparation of Health Education materials 5
6. Exposure to team concept and National Health Care systems:
a) Observation of functioning of health infrastructure.
b) Observation of functioning of health casre team including multipurpose workers male and female, health educators and other workers.
c) Observation of atleast one National Health Programme:-
d) Observation of interlinkages of delivery of oral health care with Primary Health care.
Mobile dental clinics, as and when available, should be provided for this teachings.

## 10 **Elective Posting**

The Interns shall be posted for 15 days in any of the dental departments of their choice mentioned in the foregoing.

## **Organisation of content:**

The Curriculum during the 4 years of BDS training is subject based with more emphasis on learning practical skills. During one year internship the emphasis will be on competency-based, community oriented training. The practical skills

to be mastered by the interns along with the minimum performance level are given under the course content of different departments of Dental Education. The supervisors should seding it that proper facilities are provided in all departments and attached institutions for their performance.

**Specification of teaching activities:**

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

**Use of Resource Materials:**

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

**Evaluation**

**1. Formative Evaluation:**

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

**2. Summative Evaluation:**

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

11. **Rural Services**

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

1. Community Health Monitoring programmes and services which include Preventive, Diagnostic and corrective procedures
2. To create educational awareness about dental hygiene and diseases.
3. Conduction of Oral Health Education Programmes at –

(a) School Setting - 5
(b) community Setting - 5
(c) Adult Education Programme - 5

4. compulsory setup of satellite clinics in remote areas - 1
5. Lectures to create awareness and education in public forums about the harmful effects of tobacco consumption and the predisposition to oral cancer
– two Lectures per student.

**Period of Postings**

1 Oral Medicine & Radiology- 1 month
2 Oral & Maxillofacial Surgery- 1 ½ months
3 Prosthodontics - 1 ½ months
4 Periodontics - 1 month
5 Conservative Dentistry- 1 month
6 Pedodontics- 1 month
7 Oral Pathology and Microbiology - 15 days
8 Orthodontics - 1 month
9 Community Dentistry/ Rural Services - 3 months
10 Elective - 15 days