

# MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

## SYLLABUS : FINAL BDS

**Candidate will be examined in the following subjects :**

1. Prosthodontics
2. Conservative Dentistry including Endodontics.
3. Pedodontics.
4. Oral and Maxillofacial Surgery.
5. Periodontics.
6. Orthodontics.
7. Oral Medicine and Radiology.

### **Subject 1 : PROSTHODONTICS AND CROWN AND BRIDGE**

**LECTURES: 50 Lectures.**

#### Complete Denture Prosthodontics :

1. Introduction to Prosthodontics, Terminologies , Aims , Objectives and scope
2. Human Masticatory apparatus : General consideration.
3. Anatomical & Physiological Landmarks of the maxillary and Mandibular Foundations and their significance.
4. Patients education related to complete denture prosthesis.
5. History taking, examination, diagnosis and treatment planning of an edentulous patient.
6. Importance of Diet and Nutrition.
7. Surgical and Non surgical preparation of the patient.
8. Impressions for complete Denture:  
Definition, Objectives.  
Theories and Techniques of impression making.
9. Bordor moulding procedure with special attention to Posterior platal seal area.  
Various techniques for cast preparation.

#### 10) Record Bases and occlusion rims :-

materials and methods of preparation.

#### 11) Jaw relation records – Methods and instrumentation.

Orientation relation (Face bow record)

Vertical Jaw Relation

Horizontal Jaw Relations.

#### 12) Mandibular Movements and different types of articulators.

#### 13) Selection and arrangement of teeth- Anterior and posterior

Concepts of occlusion, Balanced occlusion and factors responsible for the same.

- 14) Try in of waxed up Dentures.  
Reproduction of gingival tissue morphology .
- 15) laboratory procedures ; Elasking , wax elimination, , packing, acrylisation, recovery of dentures.
- 16) Correction of processing errors – laboratory Remount procedure.
- 17) Trial insertion of Denture and Clinical Remount procedures.
- 18) Insertion of denture and instruction to a patient ; Recalls.
- 19) Repair of Broken denture; Relining & Rebasing of a denture.
- 20) Problems associated with the use of complete denture and their treatment.
- 21) Prosthetic Management of poor foundation cases (Atrophied Ridges)
- 22) Treatment of Abused oral tissues.
- 23) Recent advances.

## **B] Removable partial Dentures. :30 Lectures.**

1. Introduction to partial denture, various terminologies used in partial denture.
2. Various components of fixed and removable partial denture and their comparison.
3. Classification of partially edentulous dental arches.
4. Dental cast surveyor and use of surveying procedure, path of insertion and removal.
  5. Components of partial dentures; Their selection, requirements of design and indications. (principles of designing and stress control)
    - a) The partial denture bases.
    - b) The artificial teeth.
    - c) The Direct Retainer.
    - d) The major connector.
    - e) The minor connector.
    - f) The indirect retainer.
    - g) The stress breaker.
    - h) The precision attachments.
6. Examination, diagnosis , treatment planning, surveying of diagnostic cast.
7. Preparation of patient to receive partial denture : General preparation.
8. Tooth alteration procedure. Making final impression to get master cast. Various impression procedure and Reviews on materials used.
9. Definitive analysis of master cast, work authorization to Dental Technician.
10. Laboratory procedures related to casting for fabrication of partial denture framework (Audio Visual demonstration.)
11. Trying of cast partial framework in mouth, adjusting the occlusion. The functional impression : Altered cast technique.
12. Jaw Relation record, selection and arrangement of teeth & try-in of denture.
13. Acrylization of partial denture bases-
14. Insertion of Removable partial denture & instructions to patient .
15. Patients Complaints and their solution.
16. Factors influencing magnitude of stress transfer on abutment teeth.
17. Management of Kennedy CI I & II Cases and CI III & IV cases.
18. Perioprosthodontic relationship.

## **FIXED PROSTHODONTICS : Lectures :- 30.**

1. Aims and objectives of fixed partial denture prosthesis, and effects of loss of natural tooth/ teeth.
2. Examination & Diagnosis for patient of fixed partial denture .
3. Treatment required prior to fixed denture prosthesis.
4. Oral anatomy, physiology and histology as related to fixed partial denture prosthesis
5. Terminologies related to fixed prosthodontics.
6. Types of fixed partial dentures.
7. Component parts of fixed partial denture - Retainer, Pontic & Connector
8. Abutment selection and Questionable abutment.
9. Individual abutment preparation to receive
  1. acrylic jacket crown
  2. Porcelain fused to Metal jacket crown
  3. Partial veneer.
  4. Metal veneer crowns.
10. Tissue management and gingival dilatation methods.
11. Impression procedures in fixed prosthodontics
12. Temporization procedures.
13. Die preparation and review of materials used for die preparation , Laboratory procedures for fabrication.
14. Try in of fixed partial denture.
15. Cementation of fixed partial denture,
16. Maintenance of fixed partial denture, instructions to patients , recall visits repair of F.P.D. Management of failures in fixed partial denture treatment.
17. Restoration of Endodontically treated tooth.
18. Introduction to adhesive bridges, laminates, All ceramic crowns.

## Special Prosthesis : Lectures :- 20

Brief introduction & general consideration.

1. Maxillofacial prosthesis - Aims & objectives, various types , materials used for maxillofacial prosthesis. Obturators & splints.
2. Overdentures, Immediate denture, Intermediate/ Interim or denture Implant denture,
3. Prosthodontic consideration in geriatric patient.

Theory Hours :

- |    |                          |   |          |
|----|--------------------------|---|----------|
| 1. | Complete Denture         | : | 50 Hours |
| 2. | R.P.D.                   | : | 30 Hours |
| 3. | Fixed partial Denture    | : | 30 Hours |
| 4. | Maxillofacial Prosthesis | : | 20 Hours |

hand special

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Total            130 Hours

130 Hours Spread over Ist to IVth BDS

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Preclinical Hours : ....            360 Hrs.

Spread over Ist & II BDS.

Clinical Hours : ....            540 Hrs.

Spread over IIIrd & IV BDS.

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Total Duration : ....            1000 Hrs.

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### EXAMINATION PATTERN

#### I. Theory (Maximum) ----- 60 Marks

Theory (written) paper shall be of three hours duration.

Theory paper shall have three parts A,B, & C.

**Section A :** MCQ - Total 20 Marks.

20 multiple choice questions carrying one mark each.... 20 marks.

**Section B :** SAQ - Total 20 marks.

Ten short questions carrying two marks each ..... 20 marks.

**Section C :** LAQ - Total 20 Marks.

Two long answer question carrying ten marks each ..... 20 marks.

## II. A) CLINICALS

i) Clinical for C.D.	....	60 Marks. (breakup as per proforma)
ii) Chairside Orals	....	15 Marks.
iii) Journal (work record)	....	05 Marks.
Total	....	80 Marks

B) i) Oral (Viva Voce) 20 Marks.

(A+B)= 100 Marks

III) Internal Assessment (Theory -20 + Practical – 20) = 40 Marks

## Subject 2 : CONSERVATIVE DENTISTRY INCLUDING ENDODONTICS :

Theory Hours ... 70 Hrs. Spread over II,III & IV BDS

Preclinical Hrs .. 240 Hrs. Spread over II BDS.

Clinical Hours ... 360 Hrs. Spread over III rd & IV BDS.

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Total Duration ... 670 Hrs.

### LECTURES :

1. Definition and scope.
2. Oral Hygiene in relation to conservative dentistry.
3. Instruments-Nomenclature, design and formulae, care and Sterilization.
4. Examination, diagnosis and treatment planning.
5. Charting and recording of cases.
6. Histology of the tooth structure as related to the operative procedures.
7. Hypoplasias, Attrition, abrasion, erosion and their management.
8. Dental caries, etiology, Pathology, Clinical features, Classification diagnosis, prevention & control.
9. Cavities-classification and nomenclature.
10. Choice of filling materials.
11. Principles of cavity preparation, control of pain.
12. Prevention of damage to hard and soft tissue during operative procedures.
13. Methods employed for exclusion of saliva.
14. Bio-Mechanics of cavity design and restoration with filling materials. Pulp and tissue protection. Airotors - high speed equipment, air motor and micromotor Cavity preparation for various types of restorations including onlays inlays

and pinlays, Restorative procedures Matrices.

15. Drugs used in conservative dentistry.
16. Introduction to recent advances in restoration materials and procedures.
17. Fractured teeth and their management, effect of systemic diseases on dental tissues.
18. Sensitive dentine - its management.
19. Ceramics in Conservative Dentistry.
20. Perio-operative problems.
21. Biological aspects of restorative materials.
22. Role of conservative Dentistry in esthetics.
23. Current advances

**ENDODONTICS :**

1. Definition, aims, objects.
2. Rationale of endodontic therapy, morphology of root canal.
3. Diseases of the pulp and periapical tissue & endodontic entries.
4. Diagnostic aids in Endodontics.
5. Endodontic Instruments.
6. Care and sterilization on instruments for endodontics treatment of vital and non vital pulp. Tests for sterility of the root canal.
7. Drug used in root canal therapy.
8. Biomaterial preparation & obturation of Root canal various techniques and material used.
13. Geriatric endodontics.
10. Bleaching of teeth, Restoration of endodontically treated teeth.
11. Surgical treatment in Endodontics.
12. Emergencies in Endodontics, Endo-Perio Problems.
13. Recent advances.

**EXAMINATION PATTERN :**

I. Theory (Maximum)----- 60 Marks

Theory (written) paper shall be of three hours duration.

Theory paper shall have three parts A,B, & C.

Section A : MCQ - Total 20 Marks.

20 multiple choice questions carrying one mark each

20 marks.

Section B : SAQ - Total 20 marks.

Ten short questions carrying two marks each 20 marks.

Section C : LAQ - Total 20 Marks.

Two long answer question carrying ten marks each .... 20 marks

**II. A) CLINICALS**

i) History taking ----- 10 Marks

ii) Cavity preparation for silver Amalgam 25 Marks  
modified class II MO or DO  
or Class I with Buccal and lingual extension

iii) Base / Lining along with matrix Band adaptation 15 Marks

iv) Permanent filling Restoration with Silver Amalgam  
& chair side Orals. 25 Marks.

iv) Record (Clinical Journal ) 05 Marks.

Total ----- 80 Marks.

B) i] Oral (Viva Voce) 20 Marks.

(A+B)= ----- 100 Marks

III) Internal Assessment (Theory -20 + Practical – 20) = 40 Marks

**Subject 3 : PEDODONTICS**

Theory Hours ... 40 Hrs. Spread over III & IV BDS.

Clinical Hours ... 150 Hrs. Spread over III & IV BDS.

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Total Duration ... 190 Hrs.

## LECTURES :

1. Introduction, definition, scope, practice management and importance of pedodontics.
2. Growth and development of Dental and oro- facial structure and normal occlusion. Developmental anomalies Genetics related to pedodontics.
3. Morphology of Dentitions and its applications :
  - a) Allied Morphology and Histology of primary and young permanent teeth.
  - b) Importance of first permanent molar.
4. Fundamental of Dental Health.
  - a) Biological factors responsible for maintenance of dental and Oral Health.
  - b) Contributory Local factors affecting oral health plaque & Saliva etc.
5. Child psychology and management of child patient.
  - a. Physical development of child
  - b. Milestone of child development & behavioral pattern as narrated in various theories.
  - c. Fear & anxiety related to pedodontics.
6. Preventive, interceptive and early corrective orthodontics for children.
7. Examination, diagnosis and treatment planning.
8. Preventive dentistry, fluorides, fissure sealants diet counselling etc. Endemic fluorosis.
9. Endodontics in pediatric dentistry.
10. Clinical aspects of pediatric dentistry as related to  
Setting of pedodontic clinic.  
Teeth disorders.  
Development Anomalies  
Dental caries in children  
Restorative Dentistry  
Pulp Therapy and Endodontics  
Space Maintainers & Myofunctional appliances .  
Treatment of traumatized teeth.  
Management of problems of the primary and mixed dentition period,  
Gingival disorders in children.  
Stomatological conditions in children

Management of handicapped children  
Mouth habits and their managements.  
Epidemiology- Definition and general principal

11. Current advances.

## CLINICALS

Case history diagnosis & treatment planning of 10 cases.

### EXAMINATION PATTERN :

#### I. Theory (maximum)----- 60 Marks

Theory (written) paper shall be of three hours duration.

Theory paper shall have three parts A,B, & C.

Section A : MCQ - Total 20 Marks.

20 multiple choice questions carrying one mark each.... 20 marks.

Section B : SAQ - Total 20 marks.

Ten short questions carrying two marks each ..... 20 marks.

Section C : LAQ - Total 20 Marks.

Two long answer question carrying ten marks each ..... 20 marks.

#### II. A) CLINICALS

i) Case History & Diagnosis	... 35 Marks
ii) Chair side Orals	... 25 Marks.
iii) Treatment Planning	... 10 Marks.
iv) Journal	... 10 Marks.
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Total -----	80 Marks.

B) Oral (Viva Voce) 20 Marks.

A + B = 100 Marks

III. Int. Assessment (Theory 20 + Practical 20 ) ----- 40 Marks

## **Subject 4 : ORAL & MAXILLOFACIAL SURGERY.**

Theory Hours :

- |                                  |     |          |
|----------------------------------|-----|----------|
| 1. Anaesthesia (Local & general) | ... | 10 Hours |
| 2. Exodontia                     | ... | 10 Hours |
| 3. Oral & Maxillofacial Surgery  | ... | 40 Hours |

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60 Hours

Spread over III & IV BDS.

Clinical Hours :           ....   220 Hours

Total Duration :           ....   280 Hours

### **LECTURES :**

#### ***Local Anaesthesia :***

1. Introduction, Theories of Local Anaesthesia.
2. Properties of an Ideal Local anaesthetic drug.
3. Classification & Properties of common local anaesthetic drugs in use.
4. Choice of anaesthesia, Local and general anaesthesia.
5. Indications and contra-indications, advantages and disadvantages of local anaesthesia.
6. Components of a standard local anaesthetic solution.
7. Mechanism of action of local anaesthesia.
8. Pre-anaesthetic medication.
9. Technique of infiltration anaesthesia, Nerve block Anaesthesia. Signs and Symptoms of anaesthesia.
10. Complications associated with local anaesthesia and their management.

#### ***General Anaesthesia :***

1. Properties of general anaesthetic drugs commonly used.
2. Pre-anaesthetic preparation of a patient and pre-medication.
3. Evaluation of a patient for general anaesthesia.
4. Short anaesthesia in Oral surgery, Endotracheal Anaesthesia, Intravenous anaesthesia.
5. Signs and Symptoms of general anaesthesia.
6. Complications arising during the administration of general anaesthesia and their management.

#### **Exodontia :**

1. Objectives.

2. Indications and contra-indication for tooth extraction.
3. Pre-operative assessment.
4. Forcep extraction. (Intra-alveolar extraction.)
5. "Surgical extraction" (Trans-alveolar extraction).
6. Extraction under general anaesthesia in the dental chair.
7. Complications of tooth extraction and their management.

### **Oral & Maxillofacial Surgery :**

1. Introduction of oral and maxillofacial surgery.
2. Diagnosis in Oral Surgery.
  - a) History taking
  - b) Clinical examination.
  - c) Special Investigations.
3. importance of general conditions of the patient in relation to Oral surgery.
4. Instruments used in Oral Surgery.
5. Basic principles of surgery. Sterilization & Asepsis, Suturing techniques.
6. Use of antibiotics in oral surgery.
7. Diagnosis, pre-operative assessment and treatment of impacted teeth.
8. Surgical procedure in relation to endodontic therapy (Apicectomy).
9. Pre-prosthetic surgery including oral implantology
10. Oro-facial infections, their diagnosis and treatment.
11. Inflammatory diseases of jaw bone and their management..
12. Diagnosis and management of Cysts of Oral Cavity.
13. Fractures of facial skeleton, Diagnosis and management.
14. Diagnosis and treatment of benign & malignant neoplastic lesions of the oral cavity (odontogenic & non-odontogenic).
15. Precancerous lesions of oral cavity, diagnosis and management.
16. Surgical Orthodontics - broad outlines.
17. Diseases of Maxillary sinus. with special reference to Oro-antral fistula.
18. Management of haemorrhage and shock in Oral Surgery.
19. Diseases of salivary glands, Diagnosis and Treatment.

20. Diseases of temporomandibular joint & its management.
21. Neurological disorders, Trigeminal Neuralgia & facial palsy.
22. Cleft lip & cleft palate.
23. Emergencies in oral surgery and its management.
24. Recent advances

## EXAMINATION PATTERN :

I. THEORY (Maximum)----- 60 MARKS.

Theory (written) paper shall be of three hours duration.

Theory paper shall have three parts A,B, & C.

Section A : MCQ - Total 20 Marks.

20 multiple choice questions carrying one mark each.... 20 marks.

Section B : SAQ - Total 20 marks.

Ten short questions carrying two marks each..... 20 marks.

Section C : LAQ - Total 20 Marks.

Two long answer question carrying ten marks each ..... 20 marks.

## II. A) CLINICALS

i) History Taking X-ray Interpretation, Instruments & Drugs	... 20 Marks
ii) Local Anaesthesia Technique	... 15 Marks.
iii) Exodontia Technique	... 25 Marks.
iv) Post Operative instructions, Management & Chairside orals	... 15 Marks.
v) Journal	... 05 Marks.
Total	80 Marks.

B) Oral (Viva Voce) .. 20 Marks.

A + B = 100 Marks

III. Int. Assessment (Theory 20 + Prct. 20) ... 40 Marks

## Subject 5 : PERIODONTICS.

Theory Hours : ..... 60 Hours.

Clinical Hrs. : ..... 220 Hours.

Total Duration : ... 280 Hours. Spread over III & Final BDS

## LECTURES :

1. Introduction - Scope and applicability of the subject.  
Historical background of periodontology.
2. Maintenance of Health Role and scope of oral physiotherapy  
measures, patient education programme and periodic check.
3. Etiopathogenesis Classification of gingival and periodontal discases. Defence  
mchanism of oral cavity.
4. Gingival enlargement.
5. Infective muco-gingival conditions-specific and non-specific.

6. Degenerative conditions-Viz disquonative gignivities and Junvenile periodontics (Gingivosis and Periodontosis.)
7. Atrophic conditions affecting gingival and periodontal tissues including aging.Periodontal problems in growing children.
8. Local and systematic factors in the causation of gingival and periodontal lesions.
9. Periodontitis and its sequelae.
10. Malocclusion, Malalignment and traumatic occlusion, Bruxsim and Tempero mandibular joint disturbances, occlusal equilibration.
11. Diagnosis and diagnostic aids including roentgenography and its uses and limitations.
12. Prognosis.
13. Morphological defects of the muco-gingival structures influencing periodontium and their treatment.
14. Treatment of all gingival and periodontal disturbances treatment planning phase and rationale. And periodontal charting Different available therapeutic procedures.  
Healing Mechanism.
15. Role of Nutrition in etiology and treatment of periodontal diseases.
16. Drugs & materials used in periodontics.
17. Instrumentation.
18. Splints.
19. Preventive periodontics.
20. Concept of focal infection.
21. Oral hygiene practices in India.
22. Inter disciplinary care & recent advances, Implants,
23. Systemic effects of periodontal diseases in brief.
24. Recent advances in perirodontics .

**EXAMINATION PATTERN :**

**I.THEORY** (Maximum)-----60 MARKS.

Theory (written) paper shall be of three hours duration.

Theory paper shall have three parts A,B, & C.

Section A : MCQ - Total 20 Marks.

20 multiple choice questions carrying one mark each.... 20 marks.

Section B : SAQ - Total 20 marks.

Ten short questions carrying two marks each ..... 20 marks.

Section C : LAQ - Total 20 Marks.

Two long answer question carrying ten marks each ..... 20 marks.

**II. A) CLINICALS**

i) Case History	. 20 Marks
ii) Instrumentation & Scaling	... 40 Marks.
iii) Post Operative instructions and chairside orals.	... 15 Marks.
iv) Journal	... 05 Marks.
Total -----	80 Marks.

B) Oral (Viva Voce)	. 20 Marks.
A + B =	100 Marks.

**III. Internal Assessment** (Theory 20 + Practical 20) ..... 40 Marks.

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**Subject 6 : ORTHODONTICS.**

Theory Hours : ..... 40 Hours.

Practicals & Clinical Hrs. : ..... 150 Hours.

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Total Duration : ... 190 Hours. Spread over III & Final BDS

**LECTURES :**

Stress in lectures should be on the Preventive and Interceptive principles of Orthodontics.

1. Definition, Aims, objects and scope of Orthodontics.
2. Growth and Development of jaws, teeth, face and skull.
3. Genetics as applied to Orthodontics.
4. Normal occlusion and its characteristics. Factors responsible for establishment and maintenance of normal occlusion.
5. Malocclusion-types, different classifications & differential diagnosis.
6. Aetiology of malocclusion.
7. History taking and examination of patient and case analysis and differential diagnosis including photographic analysis, cephalometrics and analysis and treatment planning and prognosis.
8.
  - a) Preventive and interceptive treatment aids of malocclusion.
  - b) Space management in orthodontics.
  - c) Treatment of CI I, CI II, CI III malocclusions
9. Appliances used in Orthodontic treatment - Adequate knowledge of removable and fixed appliances, Mechanical appliances and functional appliances
10. Biological and biomechanical aspects of Orthodontics treatment.
11. Retention after treatment and relapse.
12. Materials used in Orthodontics.
13. Habit breaking appliances.
14. Surgical Orthodontics.
15. Current advances.

**EXAMINATION PATTERN :**

I.THEORY (Maximum)----- 60 MARKS.

Theory (written) paper shall be of three hours duration.

Theory paper shall have three parts A,B, & C.

Section A : MCQ - Total 20 Marks.

20 multiple choice questions carrying one mark each.... 20 marks.

Section B : SAQ - Total 20 marks.

Ten short questions carrying two marks each ..... 20 marks.

Section C : LAQ - Total 20 Marks.

Two long answer question carrying ten marks each ..... 20 marks.

## II. A) PRACTICALS / CLINICALS

i) Wire bending and Preparation of an appliance in wax	...	40 Marks.
ii) Model Analysis (any two indices with brief treatment plan)	...	15 Marks.
iii) Identification of appliances, cephalometric landmarks.	...	20 Marks.
iv) Journal	...	05 Marks.
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Total		80 Marks.
B) Oral (Viva Voce)	...	20 Marks.
A + B	=	100 Marks.

III. Internal Assessment (Theory 20 + Prctical. 20 ) ...40 Marks.

**Subject 7 : ORAL MEDICINE, DIAGNOSIS & RADIOLOGY.**

Theory Hours : ..... 40 Hours.

Clinical Hrs. : ..... 90 Hours.

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Total Duration : ... 130 Hours. Spread over III & IV BDS

**LECTURES :**

Oral Medicine and Diagnosis :

1. Scope and importance of the subject.
2. Acute infections of oral & perioral structures.
3. Ulcerative & Vesiculobullous lesions of oral cavity.
4. Red and White lesions affecting oral mucosa.
5. Pigmentation of oral-tissues.
6. Diseases of tongue.
7. Diagnosis and differential diagnosis of Caries, Pulpitis & Periodontitis & regressive changes of dentition.
8. Metabolic, allergic and Endocrine disturbances and their oral manifestations.
9. Nutritional deficiencies and their significance in dentistry.
10. Blood dyscrasias and their management.
11. Oral sepsis and its effect on general system.
12. Dermatological disorders & their oral manifestations.
13. Disorder of Temporomandibular joints.
14. Diseases of Jaw-bone.
15. Diseases of Maxillary-Sinus.
16. Oral Pre-malignant lesions.
17. Benign & malignant neoplasms of oral cavity.
18. Cervico-facial lymphadenopathy.
19. Diseases of salivary glands.
20. Oro-Facial pain.
21. Cysts of the oral cavity.
22. Management of Cardiac patient in dentistry.
23. Methods of diagnosis including special investigations.
24. Immunological concepts of oral lesions, HIV Infection, Hepatitis & other viral infections.
25. Forensic odontology.
26. Recent advances.

## **RADIOLOGY**

1. Physics of radiation Production and properties of X-rays and radiation biology.
2. Principles of X-ray production & fluoroscopy factors affecting procedure radiographs, Intensifying screens and grids and dark room procedures.
3. Technique of intra oral and extra-oral Radiography and normal anatomical land marks.
4. Radiological interpretation of abnormal dental and jaw conditions. & manifestation of systemic disease in jaw.
5. Elements of Radiation treatment in oral and facial conditions and their sequelae.
6. Contrast radiography and recent advances in dental Radiology including Radioactive traces.
7. Recent advances in imaging.

### **EXAMINATION PATTERN :**

I. THEORY(Maximum) 60 Marks.

Theory (written) paper shall be of three hours duration.

Theory paper shall have three parts A,B, & C.

Section A : MCQ - Total 20 Marks.

20 multiple choice questions carrying one mark each.... 20 marks.

Section B : SAQ - Total 20 marks.

Ten short questions carrying two marks each ..... 20 marks.

Section C : LAQ - Total 20 Marks.

Two long answer question carrying ten marks each ..... 20 marks.

### **II.A) CLINICALS**

i) Case History, clinical examination, 25 Marks.

Diagnosis,treatment planning of a  
case and chairside orals ...

ii) Taking an IOPA and processing  
with Interpretation ... 25 Marks.

iii) Interpretation of five clinical  
slides/or Radiographs. .... 25 Marks.

iv) Journal ... 05 Marks.

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Total ----- 80 Marks.

B) Oral (Viva Voce) ... 20 Marks.

A + B = 100 Marks.

III) Internal Assessment (Theory -20 , Practical – 20) = 40 Marks

## APPENDIX-C

### SCHEME OF INTERNAL ASSESSMENT

To assess the overall progress of the students by evaluating the professional skills he/she has developed and the knowledge he has got it is necessary to assess the students periodically. The marks to be allotted should be real estimate of the students achievement of skills and subject knowledge without any prejudice.

Maximum marks allotted for internal assessment for each subject head in theory and practical/clinical will be 20 % of the total marks.

In all four college tests shall be conducted in one academic year i.e. two tests in each term. Each test will have marks as under:

For final B.D.S. subjects :- Four college tests tube conducted in theory in final B.D.S. only. However for clinical & Practical test – 2 tests to be conducted in 3<sup>rd</sup> B.D.S. as a post ending test and 2 tests to be conducted in final BDS as a post ending test during clinical posting as under.-

#### **FIRST TERM.**

- a. First internal (for the syllabus completed from the start of term till commencement of the examination) Unit Test.
- b. Second Internal : Should include entire syllabus completed in first term (TERMINAL EXAMINATION)

#### **SECOND TERM**

- c. Third internal : Should including the topics covered only in the second term till the commencement of the examination (Unit Test)
- d. Fourth Internal should include entire syllabus prescribed by the university (PRELIMINARY EXAMINATION)
- e. The pattern of Internal Assessment will be as under:

##### **1. THEORY**

Written .... 40 Marks.

(Section A : 20 MCQ ... 10 Marks, Section B : 10 SAQ ... 20 Marks, Section C : Two LAQ ... 10 Marks,)

Oral .... 10 Marks.

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Total ----- 50 Marks.

##### **2. PRACTICAL/CLINICAL ..... 50 Marks.**

The marks for each test will be brought down to ... 5 Marks.

## MAHARASHTRA UNIVERSITY OF HEALTH SCIENCE, NASHIK

### Scheme of Practical & /or Clinical examination

University Practical/Clinical Examination ...

80 Marks

The Practical/Clinical examination shall be conducted at the centres where adequate facilities are available to conduct such examinations and the centre/college is approved/recognised by Dental Council of India.

Not more than 30 students to be examined per day. The marks should be submitted in the proforma (Appendix - E & F) supplied by the University Authority. This proforma should be signed by the examiners. Over writing or scratching will not be permitted. Any corrections made, must have the counter-signature of external examiners. The sealed envelop containing this proforma shall be submitted on the same day to the Dean for onward transmission to the Controller of examinations, Maharashtra University of Health Sciences, Nashik. No examiner or any other person connected with the work of practical examination is permitted to carry any paper or violate the rules of examination. The person found guilty will be debarred from such Confidential work for a minimum period of 5 Consecutive University examinations or the actions as suggested by the relevant Committee to investigate such matters.

### APPENDIX-E

#### FORMAT OF THE PRACTICAL / CLINICAL EXAMINATION MARKS

#### MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK

Chart showing marks obtained by the candidates in practical / clinical examination, to be submitted by the examiner in sealed cover through the Dean of the college to the Controller of Examination, MUHS, Nashik

Name of Examination : Final B.D.S. Summer / Winter 200\_\_

Centre : \_\_\_\_\_

**1) SUBJECT : PROSTHODONTIC, CROWN AND BRIDGE** Max. Marks 80

**NOTE :- SCRATCHING OR OVERWRITING IN MARKS ARE NOT ALLOWED**

Roll No.	Checking of Special Tray/or Record Bases (To Be kept ready by the Student)	Border Moulding Procedure or Establishing Vertical Jaw Relation	Final Impression or Recording Centric Jaw Relation	History and Examinations T/P and Chair Side Orals Related to Clinical Work	Clinical Work Record (Journel)	Total
	(10)	(25)	(25)	(15)	(5)	(80)

**2) SUBJECT : CONSERVATIVE DENTISTRY INCLUDING ENDOTONTICS** Max. Marks:- 80

NOTE :- SCRATCHING OR OVERWRITING IN MARKS ARE NOT ALLOWED

Roll No.	History taking Examinations and Treatment Planning	Cavity Preparation for Silver Amalgam Modified Class II MO. or DO or Class one Cavity with Buccal or Lingual Extensions	Base/Lining alwong with Materix Band adapation	Registration with Dental Amalgum and Chair side orals related with exercises	Clinical Work Record	Total
	(10)	(25)	(15)	(25)	(5)	(80)

**3) SUBJECT : PEDODONTICS**

Max. Marks:- 80

NOTE :- SCRATCHING OR OVERWRITING IN MARKS ARE NOT ALLOWED

Roll No.	Clinical Case Exam. of a Child History taking and Diagnosis	Chair Side Orals	Treatment Planning	Record (Journal)	Total
	(35)	(25)	(10)	(10)	(80)

**4) SUBJECT : ORAL MAXILLOFACIAL SURGERY**

Max. Marks:- 80

NOTE :- SCRATCHING OR OVERWRITING IN MARKS ARE NOT ALLOWED

Roll No.	Clinical Case History Exam. X-ray Enterpretation Instruments and Drugs.	Local Anaesthesia Technique	Exodontia Technique	Post Operative Instructions, Management and Chair Side Orals	Journal	Total
	(20)	(15)	(25)	(15)	(5)	(80)

**5) SUBJECT : PERIODONTICS**

Max. Marks:- 80

NOTE :- SCRATCHING OR OVERWRITING IN MARKS ARE NOT ALLOWED

Roll No.	Clinical Case History Exam. Treatment Planning	Scalling and Polishing and Instrumentation	Post Operative Instructions and Chair Side Orals	Journal	Total
	(20)	(40)	(15)	(5)	(80)

**6) SUBJECT : ORTHODONTICS**

Max. Marks:- 80

NOTE :- SCRATCHING OR OVERWRITING IN MARKS ARE NOT ALLOWED

Roll No.	Wire Bending and preparation of an appliance in Wax	Model Analysis (Any tow indices with Brief Treatment Plan)	Identification of Appliances Cephalomteric Landmarks	Journal	Total
	(40)	(15)	(20)	(5)	(80)

**7) SUBJECT : ORAL MEDICINES (ORAL DIAGNOSIS) RADIOLOGY** Max. Marks:- 80

NOTE :- SCRATCHING OR OVERWRITING IN MARKS ARE NOT ALLOWED

Roll No.	Clinical Case History Exam. Treatment Planning and Chair side Oral	Taking IOPA and Processing with Interpretation	Interpretation of Five Clinical Slides or Radiographs	Journal	Total
	(25)	(25)	(25)	(5)	(80)

**NAME AND SIGNATURE OF EXAMINERS**

1) External Examiner : \_\_\_\_\_

2) Enternel Examiner : \_\_\_\_\_

**(Common to All)**

**APPENDIX - F**

**MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK**

**Final B.D.S. Summer / Winter 200\_\_ Examination**

Subject : \_\_\_\_\_

Name of the Centre: \_\_\_\_\_

Date of Practical Conduction: \_\_\_\_\_

(No Straching or overwriting please) correction if any to be signed by External & Internal Examiners both.

: ORAL EXAMINATION MARKS :

Roll No.	Enrollment No.	Marks alloted out of 20 (Max)	
		in figures	in words

**External Examiners :**

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

**Internal Examiners :**

Name: \_\_\_\_\_

Signature: \_\_\_\_\_

**APPENDIX B**  
**MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK**  
**Scheme of Examination for Final B.D.S Examination**

Sr.No.	Subject	Subheads	Maximum marks allotted	Minimum marks required to pass in each sub head	Maximum marks allotted	Minimum marks required for awarding distinction
1	Prosthodontics	i) Theory (Written)	60	-	200	150
		ii) Oral	20	-		
		iii) Theory + Oral	80	40		
		iv) Internal Assessment (Theory)	20	-		
		iv) Theory + Oral + Internal Assessment (Theory)	100	50		
		i) Practical/Clinical	80	40		
ii) IA Practical/Clinical	20	-				
iii) Practical/Clinical + Internal Assessment (Practical/Clinical)	100	50				
2	Conservative Dentistry including Endodontics	i) Theory (Written)	60	-	200	150
		ii) Oral	20	-		
		iii) Theory + Oral	80	40		
		iv) Internal Assessment (Theory)	20	-		
		iv) Theory + Oral + Internal Assessment (Theory)	100	50		
		i) Practical/Clinical	80	40		
ii) IA Practical/Clinical	20	-				
iii) Practical/Clinical + Internal Assessment (Practical/Clinical)	100	50				
3	Pedodontics	i) Theory (Written)	60	-		
		ii) Oral	20	-		

		iii) Theory + Oral iv) Internal Assessment (Theory) iv) Theory + Oral + Internal Assessment (Theory)	80 20 100	40 - 50	200	150
		i) Practical/Clinical ii) IA Practical/Clinical iii) Practical/Clinical +Internal Assessment (Practical/Clinical)	80 20 100	40 - 50		
4	Oral and Maxillofacial Surgery	i) Theory (Written) ii) Oral iii) Theory + Oral iv) Internal Assessment (Theory) iv) Theory + Oral + Internal Assessment (Theory)	60 20 80 20 100	- - 40 - 50	200	150
		i) Practical/Clinical ii) IA Practical/Clinical iii) Practical/Clinical +Internal Assessment (Practical/Clinical)	80 20 100	40 - 50		
5	Pedodontics	i) Theory (Written) ii) Oral iii) Theory + Oral iv) Internal Assessment (Theory) iv) Theory + Oral + Internal Assessment (Theory)	60 20 80 20 100	- - 40 - 50	200	150
		i) Practical/Clinical ii) IA Practical/Clinical iii) Practical/Clinical +Internal Assessment (Practical/Clinical)	80 20 100	40 - 50		

6	Orthodontics	i) Theory (Written)	60	-	200	150
		ii) Oral	20	-		
		iii) Theory + Oral	80	40		
		iv) Internal Assessment (Theory)	20	-		
		iv) Theory + Oral + Internal Assessment (Theory)	100	50		
		i) Practical/Clinical	80	40		
7	Oral Medicine and Radiology	ii) IA Practical/Clinical	20	-		
		iii) Practical/Clinical +Internal Assessment (Practical/Clinical)	100	50		
		i) Theory (Written)	60	-	200	150
		ii) Oral	20	-		
		iii) Theory + Oral	80	40		
		iv) Internal Assessment (Theory)	20	-		
iv) Theory + Oral + Internal Assessment (Theory)	100	50				
i) Practical/Clinical	80	40				
			Grand Total		1400	1050

**Appendix – D**

**MAHARASHTRA UNIVERSITY OF HEALTH SCIENCES, NASHIK**

**INTERNAL ASSESSMENT MARKS FOR ....B.D.S. SUMMER/WINTER EXAMINATION, YEAR**

Subject: \_\_\_\_\_  
College: \_\_\_\_\_

Subhead – Theory / Practical

Sr. No.	Enrollment No	Roll No.	Name of the Student	Internal Assessment Test				Aggregate Total Out of 20	Net total (after rounding the fraction, if any) Marks obtained out of 20	In Words (Out of Twenty)	Signature of Student
				First Max 5	Second Max 5	Third Max 5	Fourth Max 5				

Certificate that the marks entered in above proforma are as obtained by the candidates. The department will produce the necessary documents for verification University Authority if required.

Date : \_\_\_\_\_

\_\_\_\_\_  
Signature of Subject Teacher)

\_\_\_\_\_  
(Signature of Head of the Department)

## **Duration of the Courses:**

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

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.

## **Migration:**

Migration from one dental college to other is not a right of a student. However, migration of students from one dental college to another dental college in India may be considered by the Dental council of India. Only in exceptional cases on extreme compassionate ground\*, provided following criteria are fulfilled. Routine migrations on other ground shall not be allowed.

Both the colleges, i.e. one at which the student is studying at present and one to which migration is sought, are recognised by the Dental Council of India.

The applicant candidate should have passed first professional BDS examination.

The applicant candidate submits his application for migration, complete in all respects, to all authorities concerned within a period of one month of passing (declaration of results) the first professional Bachelor of Dental Surgery (BDS) examination.

The applicant candidate must submit an affidavit stating that he/she will pursue 240 days of prescribed study before appearing at II<sup>nd</sup> professional Bachelor of Dental Surgery (BDS) examination at the transferee dental college, which should be duly certified by the Registrar of the concerned University in which he/she is seeking transfer. The transfer will be applicable only after receipt of the affidavit.

## **Note 1:**

- (i) Migration is permitted only in the beginning of II<sup>nd</sup> year BDS Course in recognized Institution.

All applications for migration shall be referred to Dental Council of India by college authorities. No Institution / University shall allow migrations directly without the prior approval of the Council.

Council reserved the right, not to entertain any application which is not under the prescribed compassionate grounds and also to take independent decisions where applicant has been allowed to migrate without referring the same to the Council.

**Note 2: \*compassionate ground criteria:**

Death of supporting guardian.

Disturbed conditions as declared by Government in the Dental College area.

**III. Attendance requirement, Progress and Conduct**

75% in theory and 75% in practical / clinical in each year.

In case of a subject in which there is no examination at the end of the academic year / semester, the percentage of attendance shall not be less than 70%.

However, at the time of appearing for the professional examination in the subject, the aggregate percentage of attendance in the subject should satisfy condition (i) above.

**IV. Subjects of Study:**

**First Year**

General Human Anatomy including Embryology and Histology

General Human Physiology and Biochemistry, Nutrition and Dietics

Dental Anatomy, Embryology and Oral Histology

Dental Materials

Pre-clinical Prosthodontics and Crown & Bridge

**Second Year**

General Pathology & Microbiology

General and Dental Pharmacology and Therapeutics

Dental Materials

Pre clinical Conservative Dentistry

Pre clinical Prosthodontics and Crown & Bridge

Oral Pathology & Oral Microbiology

### **Third Year**

General Medicine

General Surgery

Oral Pathology and Oral Microbiology

Conservative Dentistry and Endodontics

Oral & Maxillofacial Surgery

Oral Medicine and Radiology

Orthodontics & Dentofacial Orthopaedics

viii) Paediatric & Preventive Dentistry

Periodontology

Prosthodontics and Crown & Bridge

### **Fourth Year**

Public Health Dentistry

Periodontology

Orthodontics & Dentofacial orthopaedics

Oral Medicine & Radiology

Oral & Maxillofacial Surgery

Conservative Dentistry and Endodontics

Prosthodontics and Crown & Bridge

Paediatric & Preventive Dentistry

OR

#### **Part I**

Public Health Dentistry

Periodontology

Orthodontics & Dentofacial orthopaedics

Oral Medicine & Radiology

#### **Part II**

Oral & Maxillofacial Surgery

Conservative Dentistry and Endodontics

Prosthodontics and Crown & Bridge

Paediatric & Preventive Dentistry

**MINIMUM WORKING HOURS FOR EACH SUBJECT OF STUDY**  
(BDS COURSE)

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

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

Internship – 240X8 hours-1920 clinical hours

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

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

## II. B.D.S.

Subject	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General & Dental Pharmacology & Therapeutics	70	20		90
General Pathology	55	55		110
Microbiology	65	50		115
Dental Materials	60	200		260
Oral Pathology and Oral Microbiology	25	50		75
Pre clinical Prosthodontics and crown & Bridge	25	200		225
Pre Clinical Conservative Dentistry	25	200		225
<b>Total</b>	<b>325</b>	<b>775</b>		<b>1100</b>

## III. B.D.S.

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

## IV. B.D.S.

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

## **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 structures. So that relevant anatomical and scientific foundations are laid down for the clinical years of the BDS course.

### **B) OBJECTIVES :**

#### **a) KNOWLEDGE AND UNDERSTANDING :**

At the end of the 1<sup>st</sup> year BDS Course in Anatomical Sciences the undergraduate student is Expected to :

Know the normal disposition of the structures in the body while clinically examining a patient and while conducting clinical procedures.

Know the anatomical basis of disease and injury.

Know the microscopic structure of the various tissues, a pre requisite for understanding of the disease processes.

Know the nervous system to locate the site of lesions according to the sensory and or motor deficits encountered.

Have an idea about the basis of abnormal development critical stages of development, effect of teratogens, genetic mutations and environmental hazards.

Know the sectional anatomy of head neck and brain to read the features in radiographs and pictures taken by modern imaging techniques.

Know the anatomy of cardio-pulmonary resuscitation.

#### **b) SKILLS**

To locate various structures of the body and to mark the topography of the living anatomy.

To identify various tissues under microscope.

To identify the features in radiographs and modern imaging techniques.

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 and clinical subjects not only keeps the curiosity alive in the learner but also lays down the scientific foundation for making a better doctor, a benefit to the society.

This insight is gained in a variety of ways :

Lecturers and small group teaching

Demonstrations

Dissection of the human cadaver

Study of dissected specimens

Osteology

Surface anatomy on living individual

Study of radiographs and other modern imaging techniques

Study of Histology slides

Study of embryology models.

Audio visual aids.

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

### **D) AN OUTLINE OF THE COURSE CONTENT :**

General anatomy : Introduction of anatomical terms and brief outline of various systems of the body.

Regional anatomy of head and neck with osteology of bones of head and neck with emphasis on topics of dental importance.

General disposition of thoracic, abdominal and pelvic organs.

The regional Anatomy of the sites of intramuscular and intra vascular injections and lumbar puncture

General embryology and systemic embryology with respect to development of head and neck.

6. Histology of basic tissues and of the organs of gastrointestinal, respiratory endocrine, excretory systems and gonads

7. Medical genetics.

## **E) FURTHER DETAILS OF THE COURSE:**

### **I. INTRODUCTION TO :**

Anatomical terms

Skin, superficial fascia and deep fascia

Cardiovascular system, portal system collateral circulation and arteries.

Lymphatic system, regional lymph nodes

Osteology - including ossification and growth of bones

Myology - Including types of muscle tissue and innervation

Syndesmology - including classification of Joints

Nervous system

### **II. HEAD & NECK :**

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

### **III. THORAX :** Demonstration on a dissected specimen of

Thoracic wall

Heart Chambers

Coronary arteries

Pericardium

5, Lungs - surfaces ; pleural cavity

6. Diaphragm

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

Peritoneal cavity

Organs in the abdominal and pelvic cavity

## **V. CLINICAL PROCEDURE :**

a) Intramuscular injections : Demonstration on a dissected specimen and on a living person of the following sites of injection.

Deltoid muscles and its relation to the axillary nerve and radial nerve.

Gluteal region and the relation of the sciatic nerve.

Vastus lateralis muscle.

Intravenous injections and venesection : Demonstration of veins in the dissected specimen and on a living person.

1. Median cubital vein 2. Cephalic Vein 3. Basilic vein 4. Long saphenous vein

Arterial pulsations : Demonstration of arteries on a dissected specimen and feeling of pulsation of the following arteries on a living person.

1. Superficial temporal 2. Facial 3. carotid 4. Axillary 5. Brachial 6. Radial 7. Ulnar Femoral  
9. Popliteal 10. Dorsalispedis

d) Lumbar puncture: Demonstration on a dissected specimen of the spinal cord cauda equine and 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 and fate, Pharyngeal arches, pouches and 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 Tissues, nervous tissue : Peripheral Nerve, optic nerve, sensory ganglion, motor ganglion, skin.

Classification of Glands

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

## **VIII. MEDICAL GENETICS :**

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

### **RECOMMENDED BOOKS :**

SNELL (Richard S.) Clinical Anatomy for Medical students Ed. 5, Little Brown & Company Boston.

RJ. LAST's Anatomy : McMinn, 9<sup>th</sup> edition.

ROMANES (G.J.) Cunningham Manual of Practical Anatomy : Head & Neck & Brain Ed. Vol. III, Oxford Medical Publication.

WHEATER, BURKITT & DANIELS, Functional Histology, Ed. 2, Churchill Livingstone.

SADLER, LANGMANS, Medical Embryology, Ed. 6.

JAMES E ANDERSON, Grant's Atlas of Anatomy. Williams & Wilkins.

WILLIAMS, Gray's Anatomy, Ed. 38., Churchill Livingstone.

EMERY, Medical Genetics.

Text book of Human Histology with Colour Atlas - Inderbir Singh, 5<sup>th</sup> Edition

10. B.D. Chaurasiya's Hand Book of General Anatomy - B. D. Chaurasiya - 3<sup>rd</sup> Edition

11. Human Embryology - Inderbir Singh, C P Pal - 8<sup>th</sup> Edition

B D Chaurasiya's Human Anatomy Regional & Applied - B.D. Chaurasiya - 5<sup>th</sup> Edition Vol. I, II, III

Anand's Human Anatomy Complete book for Dental Students (A text book of human Anatomy) - Mahindra Kr. Anand - 1<sup>st</sup> Edition

Text book of Anatomy with Colour Atlas - Inderbir Singh 4<sup>th</sup> Edition, Vol. I, II, III

## **2. HUMAN PHYSIOLOGY**

### **A) GOAL**

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

### **OBJECTIVE :**

#### **a) KNOWLEDGE :**

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

1. Explain the normal functioning of all the organ systems and their interactions for well coordinated total body function.

Assess the relative contribution of each organ systems towards the maintenance of the milieu interior.

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 :

Conduct experiments designed for the study of physiological phenomena.

Interpret experimental and investigative data.

Distinguish between normal and abnormal data derived as a result of tests which he / she has performed and observed in the laboratory.

## **c) INTEGRATION :**

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

## **B) COURSE CONTENT THEORY**

### **1. GENERAL PHYSIOLOGY**

Homeostasis: Basic concept, Feed back mechanisms.

Structure of cell membrane, transport across cell membrane.

Membrane potential.

### **2. BLOOD**

Composition & functions of blood

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

Plasma proteins : Types concentration, functions & variations.

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

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

Haemoglobin - Normal concentration, method of determination & variation in concentration. Blood Indices - MCV, MCH, MCHC - definition, normal values, variation.

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

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

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

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

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

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

Blood volume : Normal values variations.

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

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

Functions of reticulo endothelial system.

### **3. MUSCLE AND NERVE**

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

### **4. DIGESTIVE SYSTEM :**

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

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

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

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

Liver : structure, composition of bile, functions of bile, regulation of secretion Gall bladder : structure, functions

Small intestine - Composition, functions & Regulation of secretion of intestinal juice. Large Intestine - Functions

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

### **5. EXCRETORY SYSTEM :**

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

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

Mechanism of concentration & dilution of urine.

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

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

## **BODY TEMPERATURE & FUNCTIONS of SKIN**

### **ENDOCRINOLOGY**

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

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**

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, material changes during pregnancy, pregnancy tests & parturition.

Lactation, composition of milk factors controlling lactation, milk ejection, reflex,

Male reproductive system : spermatogenesis, semen and contraception.

### **9. CARDIO VASCULAR SYSTEM**

Functional anatomy and innervation of heart properties of cardiac muscle. Origin & propagation of cardiac impulse and heart block.

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

Cardiac cycle - Phases, Pressure changes in atria,, ventricles & aorta. Volume changes in ventricles. Jugular venous pulse, arterial pulse. Heart sounds : Mention of murmurs

Heart rate : Normal value, variation & regulation

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

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

coronary circulation.

Cardio vascular homeostasis - Exercise & Posture.

## **10. RESPIRATORY SYSTEM**

Physiology of Respiration: External & internal respiration

Functional anatomy of respiratory passage & lungs.

Respiratory movements : Muscles of respiration, mechanism of inflation & deflation of lungs

Intra pleural & intra pulmonary pressures & their changes during the phases of respiration. Mechanics of breathing - surfactant, compliance & work of breathing.

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

Pulmonary ventilation - alveolar ventilation & dead space - ventilation

Composition of inspired air, alveolar air and expired air.

Exchange of gases : Diffusing capacity, factors affecting it

Transport of Oxygen & carbon dioxide in the blood

Regulation of respiration - Neural & chemical

Hypoxia cyanosis, dyspnoea, periodic breathing

Artificial respiration, pulmonary function tests.

## **11. CENTRAL NERVOUS SYSTEM**

Organization of central nervous system

Neuronal organization at spinal cord level

Synapse receptors, reflexes, sensations and tracts

Physiology of pain

Functions of cerebellum thalamus, hypothalamus and cerebral cortex

Formation and functions of CSF

Autonomic nervous system

## **12. SPECIAL SENSES**

Fundamental knowledge of vision, hearing taste and smell

### **PRACTICALS**

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

## PROCEDURE

- Enumeration of Red Blood Cells
- Enumeration of White Blood Cells
- Differential leucocyte counts
- Determination of Haemoglobin
- Determination of blood group
- Determination of bleeding time and clotting time
- Examination of pulse
- Recording of blood pressure.

## DEMONSTRATION

- Determination of packed cell volume and erythrocyte sedimentation rate
- Determination of specific gravity of blood
- Determination of erythrocyte fragility
- Determination of vital capacity and timed vital capacity
- Skeletal muscle experiments

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

Electrocardiography : Demonstration of recording of normal Electro cardiogram

Clinical examination of cardiovascular and respiratory system.

## TEXT BOOKS

- Guyton ; Text book of Physiology, 9<sup>th</sup> edition
- Ganong ; Review of medical Physiology, 19<sup>th</sup> edition
- Vander, Human Physiology, 5<sup>th</sup> edition
- Choudhari ; Concise Medical Physiology, 2<sup>nd</sup> edition
- Chatterjee : Human Physiology, 10<sup>th</sup> edition
- A.K. Jain : Human Physiology for BDS students, 1<sup>st</sup> edition.

## BOOKS FOR REFERENCE

- Berne & Levey ; Physiology, 2<sup>nd</sup> edition
- Vest-Best & Taylors Physiological basis of Medical Practise, 11<sup>th</sup> edition

## EXPERIMENTAL PHYSIOLOGY ;

- Rannade ; Practical Physiology, 4<sup>th</sup> edition
- Ghai; a text book of practical physiology
- Hutchisons ; Clinical Methods, 20<sup>th</sup> edition

## BIOCHEMISTRY

### AIMS AND SCOPE OF THE COURSE IN BIOCHEMISTRY

The major aim is to provide a sound but crisp knowledge on the biochemical basis of the life processes relevant to the human system and to dental / medical practice. The contents should be 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 memorize them,. An introduction to biochemical genetics and molecular biology is a must but details should be avoided. The exposure to antivitamins, antimetabolites and enzyme inhibitors at this stage, will provide a basis for the future study of medical subjects. An overview of metabolic regulation is to be taught by covering hormonal action, second messengers and regulation of enzyme activities. Medical aspects of biochemistry should avoid describing innumerable functional tests, most of which are not in vogue. Cataloguing genetic disorders under each head of metabolism is unnecessary. A few examples which correlate genotype change to functional changes should be adequate.

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

Need not know the structure of cholesterol. Should know why it cannot be carried free in plasma

Mutarotation should not be taught. Student should know why amylase will not hydrolyse cellulose.

Need not know the details of alpha - helix and beta - pleats in proteins should know why haemoglobin is globular and keratin is fibrous.

Need not know mechanism of oxidative phosphorylation.

Should know more than 90% of ATP is formed by this process

5. Need not know details of the conversion of pepsinogen to pepsin

Should know hydrochloric acid cannot break a peptide bond at room temperature. 6. Need not remember the steps of glycogenesis.

should know that excess intake of carbohydrate will not increase glycogen level in liver or muscle.

7. Need not know about urea or creatinine clearance tests.

Should know the basis of increase of urea and creatinine in blood in renal insufficiency.

8. Need not know the structure of insulin

should know why insulin level in circulation is normal in most cases of maturity onset diabetes.

9. Need not know the structural details of ATP.

Should know why about 10 g of ATP in the body at any given time meets all the energy

needs. 10. Need not know the mechanism of action of prolyhydroxylase

should know why the gum bleeds in scurvy.

11. Need not know the structure of vitamin K.

Should know the basis of internal bleeding arising due to its deficiency.

12. Need not remember the structure of HMGCoA.

should know why it does not lead to increased cholesterol synthesis in starvation.

## **BIOCHEMISTRY & NUTRITION**

### **1. CHEMISTRY OF BIOORGANIC MOLECULES**

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

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

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

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

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

### **2. MACRONUTRIENTS AND DIGESTION**

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

Enzymatic hydrolysis of dietary carbohydrates. Mechanism of uptake of monosaccharides.

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

### **3. MICRONUTRIENTS :**

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

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

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

### **4. ENERGY METABOLISM**

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

### **5. SPECIAL ASPECTS OF METABOLISM**

Importance of pentose phosphate pathway. Formation of glucuronic acid. Outlines of cholesterol synthesis and breakdown. Ammonia metabolism. Urea formation phosphocretine 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 function of RNA. Genetic code and mutation. Outline of translation process. Antimetabolites and antibiotics interfering in replication. transcription and translation. Introduction to cancer, viruses and oncogenes.

### **7. ENZYME AND METABOLIC RELATION**

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

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

## **8. STRUCTURAL COMPONENTS AND BLOOD PROTEINS**

Connective tissue : Collagen and elastin. Glycosaminoglycans. Bone structure. Structure of membranes. Membrane associated processes in brief. Exocytosis and endocytosis.

Introduction to cytoskeleton. Myofibril and muscle contraction in brief.

Hemoglobin : Functions. Introduction to heme synthesis and degradation. Plasma protein classification and separation. Functions of albumin. A brief account of immunoglobulins.

Plasma lipoproteins : Formation; function and turnover.

## **9. MEDICAL BIOCHEMISTRY**

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

### **PRACTICAL : Contact hours 50**

1. Quantitative analysis of carbohydrates	4
2. Color reactions of proteins and amino acids	4
3. Identification of nonprotein nitrogen substance	4
4. Normal constituents of urine	4
5. Abnormal constituents of urine	4
6. Analysis of saliva including amylase	2
7. Analysis of milk Quantitative estimations	2
8. Titrable acidity and ammonia in urine	2
9. Free and total acidity in gastric juice	2
10. Blood glucose estimation	2
11. Serum total protein estimation	2
12. Urine creatinine estimation Demonstration	2
13. Paper electrophoresis charts / clinical data evaluation	2
14. Glucose tolerance test profile	2

15. Serum lipid profiles	1
16. Profiles of hypothyroidism and hyperthyroidism	1
17. Profiles of hyper and hypoparathyroidism	1
18. Profiles of liver function	1
19. Urea, uric acid creatinine profile in kidney disorders	1
20. Blood gas profile in acidosis / alkalosis	1

### **RECOMMENDED BOOKS**

“Essential of Biochemistry” as a Text Book for 1st year BDS Course – Pankaja Naik  
 Concise text book of Biochemistry (3<sup>rd</sup> edition) 2001, T.N. Pattabiraman  
 Nutritional Biochemistry 1995, S. Ramakrishnan and S. V. Rao  
 Lecture notes in Biochemistry 1984, J. K. Kandlish

### Reference Books :

Test book of Biochemistry with clinical correlations 1997, T. N. Devlin  
 Harpers Biochemistry, 1996., R. K. Murray et.al  
 Basic and applied Dental Biochemistry, 1979, R.A.D. Williams & J.C. Elliot.

## **DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY**

### **INTRODUCTION**

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

### **SKILLS**

The student should acquire basic skills in :

Carving of crowns of permanent teeth in wax.

Microscopic study of Oral tissues.

Identification of Deciduous & Permanent teeth

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 and functions of oral tissues and variations in different pathological / non pathological states

The student should understand the histological basis of various dental treatment procedures and physiologic ageing process in the dental tissues.

3. The students must know the basic knowledge of various research methodologies.

## **I. TOOTH MORPHOLOGY**

### 1. Introduction to tooth morphology :

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

### 2. Morphology of permanent teeth :

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

### 3. Morphology of Deciduous teeth :

- ❖ Generalized differences between Deciduous & Permanent teeth
- ❖ Description of individual deciduous teeth, including their chronology of development endodontic anatomy, differences between similar class of teeth & identification of individual teeth

### 4. Occlusion :

- ❖ Definition, factors influencing occlusion - basal bone, arch, individual teeth, external and internal forces and sequence of eruption.
- ❖ Inclination of individual teeth - compensatory curves.
- ❖ Centric relation and centric occlusion - protrusive, retrusive and lateral occlusion.
- ❖ Clinical significance of normal occlusion.
- ❖ Introduction to and classification of Malocclusion.

## **II. ORAL EMBRYOLOGY :**

Brief review of development of face, jaws, lip, palate & tongue, with applied aspects.

Development of teeth :

- ❖ Epithelial mesenchymal interaction, detailed study of different stages of development of crown, root & supporting tissues of tooth & detailed study of formation of calcified tissues.
  - ❖ Applied aspects of disorders in development of teeth.
- ### 3. Eruption of deciduous and permanent teeth.
- ❖ Mechanisms in tooth eruption, different theories & histology of eruption, formation of dentogingival junction, role of gubernacular cord in eruption of permanent teeth.
  - ❖ Clinical or applied aspects of disorders of eruption.

#### 4. Shedding of teeth.

- ✦ Factors & Mechanisms of shedding of deciduous teeth.
- ✦ Complications of shedding.

### **III ORAL HISTOLOGY**

1. Detailed microscopic study of Enamel, Dentine, Cementum and Pulp tissue. Age changes and Applied aspects (clinical and forensic significance) of histological consideration. Fluoride applications, transparent dentine; dentine hypersensitivity, reaction of pulp tissue to varying insults to exposed dentine ; Pulp calcifications & Hypercementosis.

2. Detailed microscopic study of Periodontal ligament and alveolar bone, age changes, histological changes in periodontal ligament and bone in normal and orthodontic tooth movement, applied aspects of alveolar bone resorption.

Detailed microscopic study of Oral Mucosa, variation in structure in relation to functional requirements, mechanisms of keratinization, clinical parts of gingiva, Dentogingival and Mucocutaneous junctions and lingual papillae. Age changes and clinical considerations.

Salivary Glands :

- ✦ Detailed microscopic study of acini and ductal system.
- ✦ Age changes and clinical considerations.

#### 5. T.M. Joint :

- ✦ Review of basic anatomical aspects and microscopic study and clinical considerations.

#### 6. Maxillary sinus :

- ✦ Microscopic study, anatomical variations, functions and clinical relevance of maxillary sinus in dental practice.

#### 7. Processing of Hard and soft tissues for microscopic study :

- ✦ Ground sections, decalcified sections and routine staining procedures

#### 8. Basic histochemical staining patterns of oral tissues.

### **IV. ORAL PHYSIOLOGY**

#### 1. Saliva :

- ✦ Composition of saliva - variations, formation of saliva and mechanisms of secretion, salivary reflexes, brief review of secretomotor pathway, functions, role of saliva in dental caries and applied aspects of hyper and hypo salivation.

## 2. Mastication :

- ❖ Masticatory force and its measurement - need for mastication, peculiarities of masticatory muscles, masticatory cycle, masticatory reflexes and neural control of mastication.

## 3. Deglutition :

- ❖ Review of the steps in deglutition, swallowing in infants, neural control of deglutition and dysphagia.

## 4. Calcium Phosphorous and fluoride metabolism :

- ❖ Source, requirements, absorption, distribution, functions and excretion, clinical considerations, hypo & hypercalcemia & hyper & hypo phosphatemia & fluorosis.

## 5. Theories of Mineralization :

- ❖ Definition, mechanisms, theories & their drawbacks.
- ❖ Applied aspects of physiology of mineralization, pathological considerations - calculus formation.

## 6. Physiology of Taste :

- ❖ Innervations of taste buds and taste pathway, physiologic basis of taste sensation, age changes and applied aspects - taste disorders.

## 7. Physiology of speech

- ❖ Review of basic anatomy of larynx and vocal cords.
- ❖ Voice production, resonators, production of vowels and different consonants - Role of palate, teeth and tongue.
- ❖ Effects of dental prosthesis and appliances on speech and basic speech disorders.

### **RECOMMENDED TEXT BOOKS :**

Orbans Oral Histology & Embryology - S. N. Bhaskar.

Oral Development & Histology - James & Avery

Wheeler's Dental Anatomy, Physiology & Occlusion - Major M, Ash

Dental Anatomy - its relevance to dentistry - Woelfel & Scheid

Applied Physiology of the mouth - Lavelle

Physiology & Biochemistry of the mouth - Jenkins

## **4. GENERAL PATHOLOGY**

### **AIM :**

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

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

## OBJECTIVES :

Enabling the student

To demonstrate and apply basic facts, concepts and theories in the field of Pathology.

To recognize and analyze pathological changes at macroscopically and microscopical levels and explain their observations in terms of disease processes.

3. To integrate knowledge from the basic sciences, clinical medicine and dentistry in the study of pathology.

To demonstrate understanding of the capabilities and limitations of morphological Pathology in its contribution to medicine, dentistry and biological research.

To demonstrate ability to consult resource materials outside lectures, laboratory and tutorial classes.

## COURSE CONTENT

### A. General Pathology

̄	̄	̄	̄	̄
Introduction to Pathology				
Terminologies				
The cell in health				
The normal cell structure				
The cellular functions				
̄	̄	̄	̄	̄
iology and Pathogenesis of Disease				
Cell Injury				
Types - congenital				
Acquired				
Mainly Acquired causes of disease				
(Hypoxic injury, chemical injury, physical injury, immunological injury)				
̄	̄	̄	̄	̄
egenerations				
Amyloidosis				
Fatty change				
Cloudy swelling				
Hyaline change, mucoid degeneration				
̄	̄	̄	̄	̄
ell death & Necrosis				
Apoptosis				
Def, causes, features and types of necrosis				

Gangrene - Dry, wet, gas

Pathological Calcification

(Dystrophic and metastatic)

## Inflammation

- Definition, causes types, and features Acute inflammation

a. The vascular response

The cellular response

Chemical Mediators

The inflammatory cells

Fate

Chronic inflammation

Granulomatous inflammation

## Healing

- Regeneration

- Repair

Mechanism

Healing by primary intention

Healing by secondary intention

Fracture healing

Factors influencing healing process

Complications

## Tuberculosis

- Epidemiology

- Pathogenesis (Formation of tubercle)

- Pathological features of Primary and secondary

TB - Complications and Fate

## Syphilis

- Epidemiology

- Types and stages of syphilis

- Pathological features

- Diagnostic criteria

- Oral lesions

## Typhoid

- Epidemiology

- Pathogenesis

- Pathological features

- Diagnostic criteria.

Thrombosis

Definition, Pathophysiology

Formation, complications & Fate of a thrombus.

Embolism

Definition

Types

Effects

Ischaemia and infraction

Definition, etiology, types

Infraction of various organs.

Derangements of body fluids

Oedema - Pathogenesis

Different types

Disorders of circulation

Hyperaemia

Shock

Nutritional Disorders

Common Vitamin Deficiencies

Immunological mechanisms in disease

Humoral & cellular immunity

Hypersensitivity & autoimmunity

AIDS and Hepatitis

Hypertension

Definition, classification

Pathophysiology

Effects in various organs.

Diabetes Mellitus

Def, Classification, Pathogenesis, Pathology in different organs.

Adaptive disorders of growth

Atrophy & Hypertrophy, Hyperplasia, Metaplasia and Dysplasia

General Aspects of neoplasia

Definition, terminology, classification

Differences between benign and malignant neoplasms

The neoplastic cell

Metastasis

Etiology and pathogenesis of neoplasia, Carcinogenesis

Tumour biology.

Oncogenes and anti oncogenes

Diagnosis

Precancerous lesions

j Common specific tumours, Sq papilloma & Ca, Basal cell Ca, Adenoma & Adenoca, Fibroma & Fibrosarcoma, Lipoma and

liposarcoma B. Systematic Pathology -

Anaemias

Iron Deficiency anaemia, Megaloblastic Anaemia

Leukaemias

Acute and chronic leukaemias, Diagnosis and clinical features

Diseases of Lymph nodes

Hodgkins disease, Non Hodgkins lymphoma, Metastatic carcinoma

Diseases of Oral cavity

Lichen planus, stomatitis, Leukoplakia, Sq cell ca, Dental caries, Dentigerous cyst,

Ameloblastoma

Disease of salivary glands

Normal structure, sialadenitis, Tumours.

Common diseases of Bones

Osteomyelitis, Metabolic bone diseases, Bone Tumours, Osteosarcoma,

Osteocalstoma, Giant cell Tumours, Ewing's sarcoma, fibrous dysplasia,

Aneurysmal bone cyst.

Diseases of Cardiovascular system

Cardiac failure

Congenital heart disease - ASD, VSD,

PDA Fallots Tetrolgy

Infective Endocarditis

Atherosclerosis

Ischaemic heart Disease

Haemorrhagic Disorders

Coagulation cascade

Coagulation disorders

Platelet function

Platelet disorders

## Practicals

Urine - Abnormal constituents

Sugar, albumin, Ketone bodies

Urine - Abnormal constituents

Blood, bile salts, bile pigments

Haemoglobin (Hb) estimation

Total WBC count

Differential WBC count

Packed cell volume (PCV,) erythrocyte sedimentation Rate (ESR)

Bleeding time & Clotting time

Histopathology

Tissue Processing

Staining

Histopathology slides

Acute appendicitis, Granulation tissue, fatty liver.

Histopathology slides.

CVC lung, CVC liver, kidney amyloidosis

11. Histopathology slides

tuberculosis, Actinomycosis,

Rhinosporidiosis 12. Histopathology slides

Papilloma, Basal cell Ca, Sq cell

Ca 13. Histopathology slides

Osteosarcoma, osteoclastoma,

fibrosarcoma 14. Histopathology slides

Malignant melanoma, Ameloblastoma

Adenoma 15. Histopathology slides

Mixed parotid tumour, metastatic

carcinoma in lymph node

## List of Textbooks

Robins - Pathologic Basis of Disease Cotran, Kumar, Robbins

Andersons Pathology Vol 1 & 2 Editors - Ivan Damjanov & James Linder

Wintrobess clinical Haematology Lee, Bithell, Forester, Athens, Lukens

## **MICROBIOLOGY**

### **AIM:**

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

Lecturers

Lecture Demonstrations

Practical exercises

Audio visual aids

Small group discussions with regular feed back from the students.

### **OBJECTIVE :**

#### **A. KNOWLEDGE AND UNDERSTANDING**

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

Understand the basics of various branches of microbiology and able to apply the knowledge relevantly

Apply the knowledge gained in related medical subjects like General Medicine and General Surgery and Dental subjects like Oral Pathology, Community Dentistry, Periodontics Oral Surgery, Pedodontics, Conservative Dentistry and Oral medicine in higher classes.

Understand and practice various methods of sterilization and disinfection in dental clinics.

Have a sound understanding of various infectious diseases and lesions in the Oral Cavity.

#### **A. SKILLS**

Student should have acquired the skill to diagnose, differentiate various oral lesions.

Should be able to select, collect and transport clinical specimens to the laboratory.

Should be able to carry out proper aseptic procedures in the dental clinic

A brief syllabus of Microbiology is given as follows ;

#### **A. GENERAL MICROBIOLOGY**

Histology, Introduction, Scope, Aims and Objectives

Morphology and Physiology of Bacteria

Detail account of Sterilization and Disinfection

Brief account of Culture media and Culture techniques

Basic knowledge of selection, collection, transport, processing of clinical specimens and identification of bacteria.

6. Bacterial Genetics and Drug Resistance in bacteria

## **B. IMMUNOLOGY**

Infection - Definition, Classification, Source, mode of transmission and types of infectious disease.

Immunity

Structure and functions of Immune system

The complement system

Antigen

Immunoglobulins : Antibodies - General structure and the role played in defense mechanism of the body.

Immune response

Antigen - Antibody reactions - with reference to clinical utility

Immuno deficiency disorders - a brief knowledge of various types of immuno deficiency disorders - A sound knowledge of immuno deficiency disorders relevant to dentistry.

Hypersensitivity reactions

Autoimmune disorders - Basic knowledge of various types - sound knowledge of autoimmune disorders of oral cavity and related structure

Immunology of Transplantation and Malignancy

Immunehaematology

## **C. SYSTEMATIC BACTERIOLOGY :**

Pyogenic cocci - Staphylococcus, Streptococcus, Pneumococcus, Gonococcus, Meningococcus - brief account of each coccus - detailed account of mode of spread, laboratory diagnosis, chemo therapy and prevention - Detailed account of cariogenic streptococci

Corynebacterium diphtheriae - mode of spread, important clinical feature, Laboratory diagnosis , Chemotherapy and Active immunization.

Mycobacteria - Tuberculosis and Leprosy

Clostridium - Gas gangrene, food poisoning and tetanus.

Non - sporing Anaerobes - in, brief about classification and morphology, in detail about dental pathogens - mechanism of disease production and prevention.

Spirochaetes - Treponema Pallidum - detailed account of Oral Lesions of syphilis,

Borrelia vincentii

7. Actinomycetes.

## **D. VIROLOGY**

Introduction

General properties, cultivation, host - virus interaction with special reference to interferon 3,  
Brief account of Laboratory diagnosis, Chemotherapy and immuno prophylaxis in general

4. A few viruses of relevance to dentistry

- Herpes Virus
- Hepatitis B Virus - brief about other types
- Human Immunodeficiency virus (HIV)
- Mumps Virus
- Brief - Measles and Rubella Virus

5. Bacteriophage - Structure and Significance

## **E. MYCOLOGY**

Brief Introduction

candidosis - in detail

Briefly on oral lesions of systemic mycoses.

## **F. PARASITOLOGY:**

Brief introduction - protozoans and helminths

Brief knowledge about the mode of transmission and prevention of commonly seen parasitic infection in the region.

## **RECOMMENDED BOOKS FOR REGULAR READING**

Text book of Microbiology - A. Ananthanarayan & C.K. Jayaram Paniker

Medical Microbiology - David Greenwood etal

## **BOOKS FOR FURTHER READING / REFERENCE**

Microbiology - Prescott, etal

Microbiology - Bernard D. Davis, etal

Clinical & Pathogenic Microbiology - Barbara J. Howard, etal

Mechanisms of Microbial diseases - Moselio Schaechter, etal

Immunology an Introduction - Tizard

Immunology 3<sup>rd</sup> edition - Evan Roitt, etal

## **5.GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICS**

### **GOAL :**

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

## **OBJECTIVES :**

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

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

List the indications, contraindications; interactions, and adverse reactions of commonly used drugs with reason.

Tailor the use of appropriate drugs in disease with consideration to its cost, efficacy safety for individual and mass therapy needs.

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.

Integrate the rational drug therapy in clinical pharmacology

Indicate the principles underlying the concepts of „Essential Drugs“.

## **SKILLS :**

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

Prescribe drugs for common dental and medical ailments

To appreciate adverse reactions and drug interactions of commonly used drugs.

Observe experiments designed for study of effects of drugs

Critically evaluate drug formulations and be able to interpret the clinical pharmacology of marketed preparations commonly used in dentistry.

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

## **LECTURE:**

### **GERNERAL PHARMACOLOGY :**

General principles of pharmacology ; sources and nature of drugs dosage forms; prescription writing; pharmacokinetics (absorption, distribution, metabolism and excretion of drugs), mode of action of drugs, combined effect of drugs, receptor mechanism of drug action, factors modifying drug response, adverse drug reactions; drug interactions, Implications of General Principles in clinical dentistry.

CNS drugs; General anaesthetics, Hypnotics, analgesics psychotropic drugs, anti-epileptics, muscle relaxants, local anaesthetics, implications of these drugs in clinical dentistry.

Autonomic drugs ; sympathomimetics, antiadrenergic drugs parasympothomimetics and parasympatholytics, Implications of Autonomic drugs in clinical dentistry.

Cardiovascular drugs ; cardiac stimulants ; antihypertensive drugs, vasopressor agents, treatment of shock, Antianginal agents and diuretics, Implications of these drugs in clinical dentistry.

Autocoids :

Histamine, antihistamines, prostaglandins, leukotriens and bronchodilators, Implications of Autocoids in Clinical dentistry.

Drugs acting on blood : coagulants and anticoagulants, hematinics, Implications of these drugs in clinical dentistry.

G.I.T. Drugs, Purgatives, anti-diarrhoeal, antacids, anti-emetics, implications of these drugs in clinical dentistry.

Endocrines; Emphasis on treatment of diabetes and glucocorticoids, thyroid and antithyroid agents, drugs affecting calcium balance and anabolic steroids, Implications of these drugs in clinical dentistry.

Chemotherapy : Antimicrobial agents (against bacteria, anaerobic infections, fungi, virus and broad spectrum). Infection management in dentistry. Pharmacotherapy of Tuberculosis, leprosy and chemotherapy of malignancy in general. Implications of chemotherapy in clinical dentistry.

Vitamins : Water soluble vitamins, Vit. D, Vit.K. and Vit E, Implications of Vitamins in clinical dentistry.

Pharmacotherapy of emergencies in dental office and emergency drugs tray Implications of Pharmacotherapy in clinical dentistry.

Chealating agents - BAL, EDTA and desferrioxamine,

## **II DENTAL PHARMACOLOGY**

Anti - septics, astringents, obtundents, mummifying agents, bleaching agents, styptics, disclosing agents, dentifrices, mouth washes, caries and fluorides.

Pharmacotherapy of common oral conditions in dentistry

Practicals and Demonstrations:

To familiarize the student with the methodology: prescription writing and dispensing. Rationale of drug combinations of marked drugs.

### **LIST OF BOOKS RECOMMENDED FOR READING AND REFERENCE**

R.S. Satoskar, Kale Bhandarkars Pharmacology and Pharmacolherapeutics, 10<sup>th</sup> Edition, Bombay Popular Prakashan 1991.

Bertam G Katzung, Basic and Clinical pharmacology 6<sup>th</sup> ed. Appleton & Lange 1997.

Lauerence D.R. Clinical Pharmacology 8<sup>th</sup> ed. Churchill Livingstone 1997.

Satoskar R.S. & Bhandarkar S.D., Pharmacology and Pharmacotherapeutics part I & part ii, 13<sup>th</sup> Popular prakashan Bombay 1993.

Tripathi K.D. Essentials of Medical Pharmacology 4<sup>th</sup> ed Jaypee Brothers 1999.

## **6. DENTAL MATERIALS**

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

### **INTRODUCTION**

#### **AIMS :**

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

#### **OBJECTIVES :**

To understand the evolution and development of science of dental material

To explain purpose of course in dental materials to personnel concerned with the profession of the dentistry. Knowledge of physical and chemical properties. Knowledge of biomechanical requirements of particular restorative procedure. An intelligent compromise of the conflicting as well as co-ordinating factors into the desired Ernest. Laying down standards or specifications of various materials to guide to manufactures as well as to help professionals. Search for newer and better materials which may answer our requirements with greater satisfaction. To understand and evaluate the claims made by manufactures of dental materials.

#### **NEED FOR THE COURSE**

The profession has to rise from an art ot a science, the need for the dentist to possess adequate knowledge of materials to exercises his best through knowledge of properties of different of types of materials. The growing concern of health hazards due to mercury toxicity,

inhalation of certain vapour or dust materials, irritations and allergic reaction to skin due to contact of materials. Materials causing irritation of oral tissues, pH of restorative materials causing inflammation and necrosis of pulp which is a cause for the dentist to possess wider knowledge of physical, chemical and biological properties of materials being used. For the protection for the patient and his own protection certain criteria of selection are provided that will enable the dentist to discriminate between facts and propaganda, which will make a material biologically acceptable.

### **SCOPE**

The dental materials is employed in mechanical procedures including restorative dentistry such as Prosthodontics, endodontics, periodontal, Orthodontics and restorative materials. There is scarcely a dental procedure that does not make use of dental materials in one form or another and therefore the application of dental material is not limited to any one branch of dentistry.

Branches such as minor surgery and periodontics require less use of materials but the physical and chemical characters of materials are important in these fields.

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

### **2) STRUCTURE OF MATTER AND PRINCIPLES OF ADHESION**

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

### **3) IMPORTANT PHYSICAL PROPERTIES APPLICABLE TO DENTAL MATERIALS**

Physical properties are based on laws of mechanics, acoustics, optics, thermodynamics, electricity, magnetism, radiation, atomic structure or nuclear phenomena, Hue, value chroma and translucency physical properties based on laws of optics, dealing with phenomena of light, vision and sight. Thermal conductivity and 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 and malleability, hardness, abrasion resistance, relaxation, rheology, Thixotropic, creep, static creep, dynamic creep, flow, color, three dimensional colour - hue values, chroma, Munsell system, metamersim, fluorescence, physical properties of tooth stress during mastication.

#### **4) BIOLOGICAL CONSIDERATIONS IN USE OF DENTAL MATERIALS**

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

#### **5) GYPSUM & GYPSUM PRODUCTS**

Gypsum - its origin chemical formula, products manufactured from gypsum.

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

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

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

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

Setting expansion, Hygroscopic setting expansion - factors affecting each

Strength : wet strength, dry strength, factors affecting strength, tensile strength Slurry - need and use.

Care of cast.

ADA classification of gypsum products

Description of impression plaster and dental investment

Manipulation including recent methods or advanced

methods. Disinfection : infection control, liquids, sprays,

radiation Method of use of disinfectants

Storage of material - shelf life

#### **6) IMPRESSION MATERIALS USED IN DENTISTRY**

Impression plaster, Impression compound, Zinc oxide eugenol impression paste and bite registration paste incl., non eugenol paste, Hydrocolloids, reversible and irreversible,

Elastomeric impression materials. Polysulphide, Condensation silicones, Addition silicones,

Polyether, visible light cure polyether urethane dimethacrylate, Historical background and development of each impression material,

Definition of impression, Purpose of making impression, Ideal properties required and application of material, classification as per ADA specification, general & individual impression material.

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

## **7) SYNTHETIC RESINS USED IN DENTISTRY**

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

Classification of resins

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

### **ACRYLIC RESINS :**

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

### **RESTORATIVE RESINS**

Historical background, Resin based restorative materials, Unfilled & filled, Composite restorative materials, Mode of supply, Composition, Polymerisation mechanisms : Chemically activated. Light activated, Dual cure : Degree of conversion, Polymerisation shrinkage

Classification of Composites : Application, co,position and proerties of each Composites of posterior teeth, Prosthodontics resins for veneering. Biocompatibility - microleakage, pulpal reaction, pulpal protection Manipulation of composites: Techniques of insertion of Chemically

activated, light activated, dual cure Polymerisation, finishing and polishing of restoration, Repair of composites Direct bonding Bonding: Need for bonding, Acid - etch technique, Enamel bonding, Dentin bonding agents. Mode of bonding, Bond strength, Sandwich technique its indication and procedure. Extended application for composites : Resins for restoring eroded teeth, Pit and fissure sealing, Resin inlays system - Indirect & direct, Core build up, Orthodontics applications.

## **8) METAL AND ALLOYS :**

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

### **History :**

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

Amalgamation : setting reaction & resulting structure, properties, Microleakage

Dimensional stability, Strength, Creep, Clinical performance

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

### **DIRECT FILLING GOLD:**

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

Classification : gold Foil, electrolytic precipitate, powdered gold.

Manipulation : Removal of surface impurities and compaction of direct filling gold. Physical properties of compacted gold, Clinical performance.

### **DENTAL CASTING ALLOYS :**

Historical background, desirable properties of casting alloys.

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

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

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

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

## **9) DENTAL WAXES INCLUDING INLAY CASTING WAX**

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

Classification of Waxes :

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

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

Other waxes : Applications, mode of supply & properties.

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

## **10) DENTAL CASTING INVESTMENTS**

Definition, requirements, classification

Gypsum bonded - classification, Phosphate bonded, silica bonded

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

Expansions : setting expansion, Hygroscopic Setting expansion, & thermal expansion : factors affecting. Properties : Strength porosity, and fineness & storage. Technical consideration :

For casting procedure Preparation of die, Wax pattern, spruing, investing, control of shrinkage compensation, wax burnout, and heating the invested ring, casting. Casting machines, source of heat for melting the alloy. Defect in casting.

## **11) SOLDERING, BRAZING AND WELDING**

Need of joining dental appliances, Terms & Definition

Solders : Definition, ideal requirement types of solders - Soft & hard and their fusion temperature, application. Mode of supply of solders, composition and selection, properties.

Tarnish & corrosion resistance mechanical properties, microstructure of soldered joint. Fluxes & Anti fluxed : Definition, function, Types, commonly used fluxes & their selection Technique of soldering & Brazing : Free hand soldering and investment, steps and procedure. Welding : Definition, application, requirements, procedure, weld decay - causes and how to avoid it. Laser welding.

## **WROUGHT BASE METAL ALLOYS**

Applications and different alloys used mainly for orthodontics purpose

Stainless steel

Cobalt chromium nickel

Nickel titanium

Beta titanium

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

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

1. Wrought cobalt chromium nickel alloys, composition, allocation, properties, heat treatment, Physical properties

Nickel - Titanium alloys, shape, memory & super elastic

Titanium alloys, application, composition, properties, welding, Corrosion resistance.

## **12) DENTAL CEMENTS**

Definition & Ideal requirements:

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

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

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

## **13) DENTAL CERAMICS**

Historical background & General applications.

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

Metal Ceramic (PFM) : Alloys - types and composition of alloys. Ceramic - Type and composition.

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

#### **14) ABRASION & POLISHING AGENTS**

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

##### **ABRASIVE ACTION :**

Desirable characteristics of an abrasive, Rate of abrasion, size of particle, pressure and speed Grading of abrasive & polishing agents. Binder, polishing materials & procedures used. Technical consideration - Material and procedure used for abrasion and polishing Electrolytic polishing and burnishing

#### **15) DIE AND COUNTER DIE MATERIALS INCLUDING ELECTROFORMING AND ELECTROPOLISHING**

types - Gypsum products, Electroforming, Epoxy resin, amalgam

**DENTAL IMPLANTS** : Evolution of dental implants, types and materials

**MECHANICS OF CUTTING** : Burns and points

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

#### **RECOMMENDED BOOKS**

Philips Science of Dental Materials : 10<sup>th</sup> edn. - Kenneth J. Anusavice

Restorative Dental Materials - 10 edn. Robert G. Craig

Notes on Dental Materials - E.C. combe

## **PRE CLINICAL CONSERVATIVE DENTISTRY LABORATORY EXERCISES.**

Identification and study of handcutting instrument chisels, gingival margin trimmers, excavators and hatchet.

Identification and use of rotary cutting instruments in contra angle hand pieces burs (Micromotor)

Preparation class I and extended class I and class II and MODs and class V amounting to 10 exercises in plaster models.

4. 10 exercises in mounted extracted teeth of following class I, 4 in number class I extended cavities 2, class II 4 in number and Class V 2 in number. Cavity preparation base application matrix and wedge placement restoration with amalgam.

Exercises on phantom head models which included cavity preparation base and varnish application matrix and wedge placement followed by amalgam restoration.

Class I	5
Class I with extension	2
Class II	10
Class H mods	2
Class V and III for glass ionomers	4
Class V for amalgam	2

Polishing of above restorations

Demonstration of class III and class V cavity preparation. For composites on extracted tooth completing the restoration.

Polishing and finishing of the restoration of composites.

Identification and manipulation of varnish bases like Zinc Phosphate, Poly carboxylate, Glass Ionomers, Zinc Oxide, Eugenol cements.

Identification and manipulation of various matrices, tooth separators and materials like composites and modified glass ionomer cements.

Cast Restoration

Preparation of Class II inlay cavity

Fabrication of wax pattern

sprue for inner attachment investing

Investing of wax pattern

Finishing and cementing of class II inlay in extracted tooth

Endodontics

Identification of basic endodontics instruments

Cornal access cavity preparation on extracted. Upper central incisors.

Determination of working length

Biomechanical Preparation of root canal space of central incisor

Obfuration of root canal spaces. Absens of cornal access cavity

Closure of access cavity

## **8 ORAL PATHOLOGY & ORAL MICROBIOLOGY**

### **OBJECTIVES :**

At the end of Oral pathology and Oral Microbiology course, the student should be able to comprehend -

The different types of pathological processes, that involve the oral cavity.

The manifestation of common diseases, their diagnosis and correlation with clinical pathological processes.

An understanding of the oral manifestations of systemic disease should help in correlating with the systemic physical signs and laboratory findings.

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

The principles of certain basic aspects of Forensic Odontology.

### **SKILLS:**

Microscopic study of common lesions affecting oral tissues through mocrosopic slides & projection slides.

Study of the disease process by surgical specimen

Study of teeth anomalies / polymorphisms through tooth specimens & plaster casts.

Microscopic study of plaque pathogens.

Study of haematological preparations (blood films) of anaemias & leukemias.

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

### **INTRODUCTION:**

- A birds eye view of the different pathological processes involving the oral cavity & oral cavity involvement in systemic disease to be brought out. Interrelationship between General Medicine & General Surgery & Oral pathology to be emphasized.

Developmental disturbances of teeth, Jaws and soft tissues of oral & paraoral region :

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

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

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

- Forensic Odontology
- Developmental disturbances of jaws - size & shape of the jaws.
- Developmental disturbances of oral & paraoral soft tissues - lip & palate - clefts, tongue, gingiva, mouth, salivary glands & face.

#### Dental caries

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

#### Pulp & Periapical Pathology & Osteomyelitis

- Etiopathogenesis & interrelationship, clinical features, microbiology, histopathology & radiological features (as appropriate) of pulp & periapical lesions osteomyelitis.
- Sequelae of periapical abscess - summary of space infections, systemic complications & significance.

#### Periodontal Diseases :

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

#### Microbial infections of oral soft tissues :

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

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

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

infection. Fungal : Candidal infection, Aphthous Ulcers.

#### Common non - inflammatory diseases involving the jaws :

- Etiopathogenesis, clinical features, radiological & laboratory values in diagnosis of : Fibrous dysplasia, Cherubism, Osteogenesis Imperfecta Paget's disease, Cleidocranial dysplasia, Rickets, Achondroplasia, Marfan's syndrome & Down's syndrome.

#### Diseases of TM joint :

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

Cysts of the Oral & Paraoral region :

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

#### Tumours of the Oral Cavity

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

Odontogenic - all lesions.

Non - odontogenic

Benign Epithelial : Papilloma, Keratoacanthoma & Naevi.

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

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

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

#### c) Salivary

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

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

#### d) Tumours of Disputed Origin - e) Metastatic

Congenital Epulis & Granular Cell Myoblastoma.  
Tumors metastasizing to & from oral cavity &  
the routes of metastasis.

#### Traumatic, Reactive & Regressive lesions Oral Cavity :

- Pyogenic & Giant cell granuloma, exostoses Fibrous Hyperplasia, Traumatic Ulcer & Traumatic Neuroma.
- Attrition, Abrasion, Erosion, Bruxism, Hypercementosis, Dentinal changes, pulp calcifications & Resorption of teeth.

- Radiation effects of oral cavity, summary of physical & Chemical injuries including allergic reaction of the oral cavity.
- Healing of Oral wounds & complications - Dry socket.

Non neoplastic Salivary Gland Diseases :

- Sialolithiasis, Sialosis, sialadenitis, Xerostomia & ptyalism.

Systemic Diseases involving Oral Cavity ;

- Brief review & Oral manifestations, diagnosis & significance of common Blood, Nutritional, Hormonal & Metabolic diseases of Oral cavity.

Mucocutaneous Lesions :

- Etiopathogenesis, clinical features & histopathology of the following common lesions. Lichen Planus, Lupus Erythematosus, Pemphigus & Pemphigoid lesions, Erythema Multiforme, Psoriasis, Scleroderma, Ectodermal Dysplasia, Epidermolysis bullosa & white sponge nevus.

Diseases of the Nerves :

- Facial neuralgias - Trigeminal & Glossopharyngeal. VII nerve paralysis,
- causalgia Psychogenic facial pain & Burning mouth syndrome

Pigmentation of Oral & Paraoral region & Discolouration of teeth :

- Causes & clinical manifestations

Disease of Maxillary Sinus :

- Traumatic injuries to sinus, Sinusitis, Cysts & Tumours involving antrum
- a) ORAL PRECANCER - CANCER ; Epidemiology, aetiology, clinical and histopathological features, TNM classification. Recent advances in diagnosis, management and prevention.
- b) Biopsy : Types of biopsy, value of biopsy, cytology, histo chemistry & frozen sections in diagnosis of oral disease.

Principles of Basic forensic Odontology (Pre-clinical Forensic Odontology):

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

## **RECOMMENDED BOOKS**

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

## **GENERAL MEDICINE**

### **GUIDELINES :**

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

Special precautions / contraindication of anaesthesia and various dental procedures in different systemic diseases.

Oral manifestations of systemic diseases.

Medical emergencies in dental practice.

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

### **THEORY SYLLABUS**

<b>CORE TOPICS (Must Know)</b>	<b>COLLATERAL TOPICS (Desirable to know)</b>
1. Aims of medicine Definition of signs, symptoms, diagnosis, differential diagnosis treatment & prognosis	
<u>2. Infections</u> Enteric fever, AIDS, herpes simplex, herpes zoster, syphilis diphtheria	Infectious mononucleosis mumps, measles, rubella, malaria.
<u>3. G.I.T.</u> Stomatitis, gingival hyperplasia, dysphagia, acid peptic disease, jaundice, acute and chronic hepatitis, cirrhosis of liver ascites.	Diarrhea Dysentery Amoebiasis Malabsorption
<u>4. CVS</u> Acute rheumatic fever rheumatic valvular heart disease, hypertension, ischemic heart disease, infective endocarditis, common arrhythmias, congenital heart disease, congestive cardiac failure.	
<u>5. RS</u> Pneumonia, COPD, Pulmonary TB, Bronchial Asthma	Lung Abscess Pleural effusion Pneumothorax Bronchiectasis Lung cancers
<u>6. Hematology</u> Anemias, bleeding & clotting, disorders, leukemias lymphomas, agranulocytosis, splenomegaly, oral manifestations of hematologic disorders,	

generalized. Lymphadenopathy	
<u>7. Renal system</u> Acute nephritis Nephrotic syndrome	Renal failure
<u>8. Nutrition</u> Avitaminosis	Balanced diet PEM Avitaminosis
<u>9. CNS</u> Facial palsy, facial pain including trigeminal neuralgia, epilepsy, headache including migraine.	- Meningitis - Examination of comatose patient - Examination of cranial nerves
<u>10. Endocrines</u> Diabetes Mellitus Acromegaly, Hypothyroidism, Thyrotoxicosis, Calcium metabolism and parathyroids.	Addison s disease, Cushing s syndrome
<u>11. Critical care</u> Syncope, cardiac arrest, CPR, Shock	Ac LVF ARDS

### **CLINICAL TRAINING :**

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

## **10. GENERAL SURGERY**

### **AIMS :**

To acquaint the student with various diseases, which may require surgical expertise and to train the student to analyze the history and be able to do a 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 benign and malignant diseases and be able to decided which patient requires further evaluation.

### **HISTORY OF SURGERY**

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

### **GENERAL PRINCIPLES OF SURGERY**

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

## WOUND

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

## INFLAMMATION

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

## 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 and septicaemia.

## TRANSMISSABLE VIRAL INFECTIONS :

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

## SHOCK AND HAEMORRHAGE :

Classification, causes, clinical features and management of various types of shock. Syncope, Circulatory collapse. Haemorrhage - different types, causes, clinical features and management. Blood groups, blood transfusion, precautions and complications of blood and their products. Hemophilias, their transmission, clinical features and management especially in relation to minor dental procedures.

## 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.

## DISEASES OF LYMPHATIC SYSTEM:

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

## DISEASES OF THE ORAL CAVITY

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

## DISEASES OF LARYNX, NASOPHARYNX:

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

## 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.

#### 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.

#### PRINCIPLES OF OPERATIVE SURGERY:

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

#### ANOMOLIES OF DEVELOPMENT OF FACE :

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

#### 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.

#### SWELLING OF THE JAW :

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

#### BIOPSY :

Different types of biopsies routinely used in surgical practice.

Skills to be developed by the end of teaching is to examine a routine swelling, ulcer and other related diseases and to perform minor surgical procedures such as draining an abscess, taking a biopsy etc.

### **11. CONSERVATIVE DENTISTRY AND ENDODONTICS :**

#### **OBJECTIVES :**

Knowledge and understanding

Skills and

Attitudes

#### **A. Knowledge and understanding :**

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

To diagnose and treat simple restorative work for teeth.

To gain knowledge about aesthetic restorative material and to translate the same to patients needs.

To gain the knowledge about endodontic treatment on the basis of scientific foundations.

To carry out simple endodontic treatment.

To carry out simple luxation of tooth and its treatment and to provide emergency endodontic treatment.

### **SKILLS :**

He should attain following skills necessary for practice of dentistry.

To use medium and high speed hand pieces to carry out restorative work.

Poses the skills to use and familiarize endodontics instruments and materials needed for carrying out simple endodontic treatment.

To achieve the skills to translate patients esthetic needs along with function.

### **ATTITUDES :**

Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.

Willingness to participate in CDE programme to update the knowledge and professional skill from time to time.

To help and participate in the implementation of the national oral health policy.

He should be able to motivate the patient for proper dental treatment at the same time proper maintenance of oral hygiene should be emphasise which will help to maintain the restorative work and prevent future damage.

### **INTRODUCTION :**

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

Nomenclature of Dentition :

Tooth numbering systems A.D.A. Zsigmondy palmer and F.D.I. systems.

Principles of Cavity Preparation :

Steps and nomenclature of cavity preparation classification of cavities, nomenclature of floors angles of cavities.

Dental caries :

Aetiology classification clinical features, morphological features, microscopic features, clinical diagnosis and sequel of dental caries.

Treatment Planning For Operative Dentistry :

Detailed clinical examination, radiographic examination. tooth vitality tests, diagnosis and treatment planning, preparation of the case sheet.

Gnathological Concepts of Restoration.

Physiology of occlusion, normal occlusion, Ideal occlusion, mandibular movements and occlusal analysis. Occlusal rehabilitation and restoration.

Aramamentarium For Cavity Preparation :

General classification of operative instruments, Hand cutting instruments design formula and sharpening of instruments. Rotary cutting instruments dental bur, mechanism of cutting, evaluation of hand piece and speed current concepts of rotary cutting procedures. Sterilization and maintenance of instruments. Basic instrument tray set up.

Control of Operating Filed

Light source sterilization field of operation control of moisture, rubber dam in detail, cotton rolls and anti sialogagues.

Amalgam Restoration :

Indication contraindication, physical and mechanical properties, clinical behaviour, cavity preparation for Class I, II, V and III. Step wise procedure for cavity preparation and restoration. Failure of amalgam restoration.

Pulp protection :

Liners, varnishes and bases, Zinc phosphate, zinc polycarboxylate, zinc oxide eugenol and glass inomer cements.

Anterior Restorations :

Selection of cases, selection of material, step wise procedures for using restorations, silicate (theory only) glass inomers, composites, including sand witch restorations and bevels of the same with a note on status of the dentine bonding agents.

Direct filling Gold restoration :

Types of direct filling gold indications and limitations of cohesive gold. Annealing of gold foil cavity preparation and condensation of gold foils.

Preventive Measures In Restorative Practice :

Plaque Control, Pitand fissure sealants dietary measures restorative procedure and periodontal health. Contact and contour of teeth and restorations matrices tooth separation and wedges.

Temporisation or Interim Restoration.

Pin Amalgam Restoration Indication Contra Indication :

Advantages disadvantages of each types of pin methods of placement use of auto matrix. Failure of pin amalgam restoration.

Management of Deep Carious Lesions Indirect And Direct Pulp Capping.

Non carious destructions Tooth Structures Diagnosis and Clinical Management.

Hyper Sensitive Dentine And Its Management.

Cast Restorations

Indications, contra indications, advantages and disadvantages and materials used for same class II and class I cavity preparation for inlays fabrication of wax pattern spurring inverting and casting procedures and casting defects.

Die Materials And Preparation of Dies

Gingival Tissue Management For Cast Restoration And Impression Procedures.

Recent Cavity Modification Amalgam Restoration.

Differences between amalgam and Inlay Cavity preparation with note on all the types of Bewels used for Cast Restoration.

Control of Pain During Operative Procedures.

Treatment Planning for Operative Dentistry Detailed Clinical Examination Radiographic Examination.

Vitality Tests, Diagnosis And Treatment Planning And Preparation Of Case Sheet.

Applied Dental Materials :

Biological Considerations.

Evaluation, clinical application and adverse effects of the following materials. Dental cements, Zinc oxide eugenol cements zinc phosphate cements, polycarboxylates glass ionomer cements, silicate cement calcium hydroxides varnishes.

Dental amalgam, technical considerations mercury toxicity mercury hygiene.

Composite, Dentine bonding agents, chemical and light curing composites.

Rubber base Imp. Materials.

Nobel metal alloys & non noble metal alloys.

Investment and die materials

Inlay casting waxes.

Dental porcelain

Aesthetic Dentistry

Endodontics : introduction definition scope and future of endodontics.

Clinical Diagnostic methods

Emergency endodontics procedures

Pulpal diseases causes, types and treatment.

Periapical diseases: acute periapical abscess, acute periodontal abscess, parodontal abscess, chronic alveolar abscess, granuloma, cysts, condensing osteitis, external resorption.

Vital pulp therapy : indirect and direct pulp capping, pulpotomy, different types and medicaments used.

Apexogenesis and apexification or problems of open apex.

Rationale of endodontic treatment case selection, indication and contraindications for root canal treatments.

Principles of root canal treatment, mouth preparation, root canal instruments, hand instruments, power driven instruments, standardization, color coding, principle of using endodontic instruments. Sterilisation of root canal instruments and materials, rubber dam application.

Anatomy of the pulp cavity : root canals, apical foramen. Anomalies of pulp cavities, access cavity preparation of anterior and premolar teeth.

Preparation of root canal space. Determination of working length, cleaning and shaping of root canals, irrigating solution, chemical aids to instrumentation.

Disinfection of root canal space, intracanal medicaments, poly antibiotic paste, root canal sealer, mummifying agents. Outline of root canal treatment, bacteriological examinations, culture methods.

Problems during cleaning and shaping of root canal spaces. Perforation and its management. Broken instruments and its management, management of single and double curved root canals.

Methods of cleaning and shaping like step back crown down and conventional methods.

Obturation of the root canal system. Requirements of an ideal root canal filling material, obturation methods using gutta-percha, healing after endodontic treatment. Failures in endodontics.

Root canal sealers. Ideal properties, classification. Manipulation of root canal sealers.

Post endodontic restoration, fabrication and components of post core preparation.

Smear layer and its importance in endodontics and conservative treatment.

Discoloured teeth and its management. Bleaching agents, vital and non vital bleaching methods.

Traumatized teeth, classification of fractured teeth. Management of fractured tooth and root.

Luxated teeth and its management.

Endodontic surgeries, indication, contraindications, pre operative preparation. Pre medication, surgical instruments and techniques, apicectomy, retrograde filling, post

operative sequelae trephination hemisection, radiscetomy techniques of tooth reimplantation (both intentional and accidental) endodontic implants.  
root resorption.  
emergency endodontic procedures.  
lasers in conservative endodontics (introduction only) practice management.  
professional association dentist act 1948 and its amendment 1993.  
duties towards the govt. Like payments of professional tax, income tax.  
financial management of practice.  
dental material and basic equipment management.  
Ethics.

## **ORAL & MAXILLOFACIAL SURGERY**

### **AIMS :**

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

### **OBJECTIVES :**

a) Knowledge & Understanding :

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

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.

Able to diagnose, manage and treat (understand the principles of treatment of) patients with oral surgical problems.

Knowledge of range of surgical treatments.

Ability to decide the requirement of a patient to have oral surgical specialist opinion or treatment.

Understand the principles of in patient management.

Understanding of the management of major oral surgical procedures and principles involved in patient management.

Should know ethical issues and communication ability.

**Skills :**

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.

Should be competent in the extraction of teeth under both local and general anesthesia.

Should be able to carry out certain minor oral surgical procedures under L.A. like frenectomy, alveolar procedures and biopsy etc.

Ability to assess, prevent and manage various complications during and after surgery.

Able to provide primary care and manage medical emergencies in the dental office.

Understanding of the management of major oral surgical problems and principles involved in inpatient management.

**DETAILED SYLLABUS**

Introduction, definition, scope, aims and objectives.

Diagnosis in oral surgery :

History taking

Clinical examination

Investigations

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

Principles of Oral Surgery -

Asepsis: Definition, measures to prevent introduction of infection during surgery.

Preparation of the patient

Measures to be taken by operator

Sterilization of instruments - various methods of sterilization etc.

Surgery set up.

Painless Surgery:

Pre-anaesthetic considerations. Pre-medication: Purpose, drugs used

Anaesthetic considerations -

a) Local b) Local with IV sedations

Use of general anaesthetic

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.

Submandibular

pre auricular

Incision to expose maxilla & orbit

Bicoronal incision

Control of haemorrhage during surgery

Normal Haemostasis

Local measures available to control bleeding Hypotensive anaesthesia etc.

Drainage & Debridement

Purpose of drainage in surgical wounds Types of drains used

Debridement : Purpose, soft tissue & bone debridement

Closure of wounds

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

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.

Exodontia : General considerations

Ideal Extraction.

Indications for extraction of teeth

Extractions in medically compromised patients. Methods of extraction -

Forceps or intra-alveolar or closed method

Principles, types of movement, force etc.

Trans-alveolar, Surgical or open method, indications, surgical procedure

Dental elevators : uses, classification, principles in the use of elevators, commonly used elevators.

Complications of Exodontia -  
Complications during Exodontia  
Common to both maxilla and mandible.  
Post-operative complications  
Prevention and management of

#### complications 6. Impacted teeth:

Incidence, definition, aetiology.

Impacted mandibular third molar.

Classification, reasons for removal,

Assessment - both clinical & radiological

Surgical procedures for removal

Complications during and after removal

Prevention and management

Maxillary third molar,

Indications for removal, classification,

surgical procedure for removal

Impacted maxillary canine

Reasons for canine impaction

Localisation, Indications for removal

Methods of management, labial and palatal approach,

Surgical exposure, transplantation, removal etc.

#### Pre- prosthetic surgery

Definition, classification of procedures

Corrective procedures : Alveoloplasty

Reduction of maxillary tuberosities,

Frenectomies and removal of tori

Ridge extension or Sulcus extension procedures

Indications and various surgical procedures

Ridge augmentation and reconstruction

Indications, use of bone grafts, Hydroxyapatite

Implants - concept of osseointegration

Knowledge of various types of implants

and surgical procedure to place implants

#### 8. Disease of the maxillary sinus

Surgical anatomy of the sinus

Sinusitis both acute and chronic

Surgical approach of sinus - Caldwell - Luc

procedure Removal of root from the sinus

Oro-antral fistula - aetiology, clinical features and various surgical methods for closure

#### 9. Disorders of T.M. joint

Applied surgical anatomy of the joint

Dislocation - types, aetiology, clinical features and management

ankylosis - Definition, aetiology, clinical features and management

Myo-facial pain dysfunction syndrome, aetiology, clinical features management Non surgical and surgical

Internal derangement of the joint

Arthritis of T.M. Joint 10.

#### Infections of the oral cavity

Introduction, factors responsible for infection, course of odontogenic

Infections, spread of odontogenic infections through various facial spaces

Dento - alveolar abscess - aetiology, clinical features and management

Osteomyelitis of the jaws - definition, aetiology, pre-disposing factors

Classification, clinical features and management

Ludwigs angina - definition, aetiology, clinical features, management and complications

#### 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 procedure, rationale of the techniques indications, procedures, complications etc.

#### Tumours of the Oral cavity

General considerations

Non odontogenic benign tumours occurring in oral cavity - fibroma, papilloma, lipoma, ossifying fibroma myxoma etc.

Ameloblastoma - clinical features, radiological appearance and methods of management

Carcinoma of the oral cavity

Biopsy - types

TNM classification

outline of management of squamous

Cell carcinoma : Surgery, radiation and chemotherapy

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

cancer 13. Fractures of the jaws -

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

Mandibular fractures - Applied anatomy,

classification Diagnosis - clinical and radiological

Management - Reduction closed and open

Fixation and immobilization 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 fracture - methods of management

Fractures of the Zygomatic complex

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

Complications of fractures - delayed union, non-union and

malunion 14. Salivary gland diseases -

Diagnosis of salivary gland diseases

Sialography, contrast media, procedure.

Infections of the salivary glands

Sialolithiasis - sub mandibular duct and gland and parotid duct. Clinical features, management

Salivary fistulae

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

15. Jaw deformities -

Basic forms - Prognathism, Retrognathism and open bite

Reasons for correction.

Outline of surgical methods carried out on mandible and

maxilla 16. Neurological disorders -

Trigeminal neuralgia - definition, aetiology, clinical features and methods of management including surgical

Facial paralysis - Aetiology, clinical features.

Nerve injuries - Classification, neurohaphy etc.

17. Cleft Lip and Palate -

Aetiology of the clefts, incidence, classification, role of dental surgeon in the management of cleft patients, Outline of the closure procedures.

18. Medical Emergencies in dental practice -

Primary care of medical emergencies in dental practice particularly -

- |                           |                 |               |
|---------------------------|-----------------|---------------|
| (a) Cardio vascular       | (b) Respiratory | (c) Endocrine |
| (d) Anaphylactic reaction | (e) Epilepsy    | (f) Epilepsy  |

19. Emergency drugs & Intra muscular I.V. Injections -

Applied anatomy, Ideal Location for giving these injection, techniques etc.

Oral Implantology

Ethics

**LOCAL ANAESTHESIA :**

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

Use of Vaso constrictors in local anaesthetic solution -

Advantages, contra-indications, various vaso constrictors used.

Anaesthesia of the mandible -

Pterygomandibular space - boundaries, contents

etc. Inferior Dental Nerve Block - various techniques

Complications

Mental foramen nerve block

Anaesthesia of Maxilla-Intra

- Orbital nerve block

Anaesthesia of Maxilla -

Intra - orbital nerve block.

Posterior superior alveolar nerve block

Maxillary nerve block - techniques.

**GENERAL ANAESTHESIA -**

Concept of general anaesthesia

Indications of general anaesthesia in dentistry

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

#### **RECOMMENDED BOOKS :**

Impacted teeth : Alling John F & etal  
Principles of oral and maxillofacial surgery ; Vol.1,2 & 3 peterson LJ & etal  
Text book of oral and maxillofacial surgery ; Srinivasan B.  
Handbook of medical emergencies in the dental office, Malamed SF.  
Killeys Fractures of the mandible ; Banks P.  
Killeys fractures of the middle 3<sup>rd</sup> of the facial skeleton; Banks P.  
The maxillary sinus and its dental implications ; McGovanda  
Killey and kays outline of oral surgery - part -1 ; Seward GR & etal  
Essentials of safe dentistry for the medically compromised patients; Mc Carthy FM  
Oral & maxillofacial surgery, Vol 2; Laskin DM  
Extraction of teeth; Howe, GL  
Minor Oral Surgery ; Howe. GL  
Contemporary oral and maxillofacial surgery; Peterson I.J. &EA  
Oral and maxillofacial infections ; Topazian RG & Goldberg MH

### **ORAL MEDICINE AND RADIOLOGY**

#### **AIMS :**

To train the students to diagnose the common disorders of Orofacial region by clinical examination and with the help of such investigations as may be required and medical management of oro-facial disorders with drugs and physical agents.

To train the students about the importance, role, use and techniques radiographs / digital radiograph and other imaging methods in diagnosis.

The principles of the clinical and radiographic aspects of Forensic Odontology.

The syllabus in ORAL MEDICINE & RADIOLOGY is divided into two main parts

(I) Diagnosis, Diagnostic methods and Oral Medicine (II) Oral Radiology, Again the part One is subdivided into three sections. (A) Diagnostic methods (B) Diagnosis and differential diagnosis (C) Oral Medicine & Therapeutics.

## **COURSE CONTENT**

Emphasis should be laid on oral manifestations of systemic diseases and ill-effects oral sepsis on general health.

To avoid confusion regarding which lesion and to what extent the student should learn and know, this elaborate syllabus is prepared. As certain lesions come under more than one group, there is repetition.

### **Part - I ORAL MEDICINE AND DIAGNOSTIC AIDS**

#### **SECTION (A) - DIAGNOSTIC METHODS**

Definition and importance of Diagnosis and various types of diagnosis.

Method of clinical examinations.

General Physical examination by inspection.

Oro-facial region by inspection, palpation and other means.

To train the students about the importance, role, use of saliva and techniques diagnosis of saliva as part of oral disease

Examination of lesions like swellings, ulcers, erosions, sinus, fistula, growth pigmented lesions, white and red patches.

Examination of lymph nodes

Forensic examination - Procedures for post-mortem dental examination; maintaining dental records and their use in dental practice and post-mortem identification; jurisprudence and ethics.

Investigations

Biopsy and exfoliative cytology

Hematological, Microbiological and other tests and investigations necessary for diagnosis and prognosis.

#### **SECTION (B) - DIAGNOSIS, DIFFERENTIAL DIGNOSIS**

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

Teeth : Developmental abnormalities, causes of destruction of teeth and their sequelae and discoloration of teeth

Diseases of bone and Osteodystrophies : Development disorders: Anomalies, Exostosis and tori, infantile cortical hyperostosis, osteogenesis imperfecta. Marfans syndrome,

osteopetrosis. Inflammation - Injury, infection and spread of infection fascial space infections osteoradionecrosis.

metabolic disorders - Histiocytosis

Endocrine - Acro - megaly and hyperparathyroidism

Miscellaneous - Paget's disease, Mono and polyostotic fibrous dysplasia, Cherubism.

Temporomandibular joint : Developmental abnormalities of the condyle. Rheumatoid arthritis, Osteoarthritis, Sub-luxation and luxation.

Common cysts and Tumours:

CYSTS: Cysts of soft tissue : Mucocele and Ranula

Cysts of bone : Odontogenic and nonodontogenic

## **TUMORS :**

Soft Tissue:

Epithelial: Papilloma, Carcinoma, Melanoma

Connective tissue : Fibroma, Lipoma, Fibrosarcoma

Vascular : Haemangioma, Lymphangioma

Nerve Tissue : Neurofibroma, Traumatic Neuroma, Neurofibromatosis

Salivary Glands ; Pleomorphic adenoma, Adenocarcinoma, Warthin's Tumour, Adenoid Cystic carcinoma.

Hard Tissue :

Non Odontogenic : Osteoma, Osteosarcoma, Osteoclastoma, Chondroma,

Chondrosarcoma, Central giant cell tumor, and Central haemangioma

Odontogenic : Enameloma, Ameloblastoma, Calcifying Epithelial Odontogenic tumor,

Adenomatoid Odontogenic tumor, Periapical cemental dysplasia and odontomas

Periodontal diseases: Gingival hyperplasia, gingivitis, periodontitis, pyogenic granuloma

Granulomatous diseases : Tuberculosis, Sarcoidosis, Midline lethal granuloma Crohn's Disease and Histiocytosis X

Miscellaneous Disorders : Burkitt lymphoma, Sturge - Weber syndrome, CREST syndrome, Rendu-Osler-Weber disease.

## **SECTION (C) : ORAL MEDICINE AND THERAPEUTICS.**

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

Infections of oral and paraoral structures:

Bacterial : Streptococcal, tuberculosis, syphilis, Vincent's, leprosy, actinomycosis, diphtheria and tetanus

Fungal : Candida albicans

Virus : Herpes simplex, herpes zoster, ramsay hunt syndrome measles, herpangina mumps, infectious mononucleosis, AIDS and hepatitis B

Important common mucosal lesions :

White lesions : Chemical burns, leukodema, leukoplakia, Fordyce spots, stomatitis nicotina palatinus, white sponge nevus, candidiasis, licherplanus, discoid lupus erythematosis

Veiculo-bullous lesions : Herpes simplex herpes zoster herpangina, bullous lichen planus, pemphigus, cicatricial pemphigoid erythema multiforme.

Ulcers : Acute and chronic ulcers

Pigmented lesions : Exogenous and endogenous

Red lesions : Eruthroplakia, Stomatitis venenata and medicamentosa, erosive, lesions and denture sore mouth Cervico-facial lymphadenopathy

Facial Pain :

(i) Organic pain : pain arising from the diseases of orofacial tissues like teeth, pulp, gingival, periodontal tissue, mucosa, tongue, muscles, blood vessels, lymph tissue, bone, paranasal sinus, salivary glands etc.

(ii) Pain arising due to C.N.S. diseases:

Pain due to intracranial and extracranial involvement of cranial nerves (Multiple sclerosis, cerebrovascular disease trojter:s syndrome etc.)

Neuralgic pain due to unknown causes : Trigeminal neuralgia, glossopharyngeal neuralgia, sphenopalatine ganglion neuralgia, periodic migrainous neuralgia and atypical facial pain.

Referred pain : Pain arising from distant tissues like heart, spine etc.,

Altered sensations : Cacogeusia halitosis.

Tongue in local and systemic disorders : (Aglossia, ankyloglossia, bifid tongue, fissured tongue, scrotal tongue, macroglossia, microglossia, geographic tongue, median rhomboid glossitis, depapillation of tongue, hairy tongue, atrophic tongue, reactive lymphoid hyperplasia, glossodynia, glossopyrosis, ulcers, white and red patches etc.)

Oral manifestations of :

Metabolic disorders :

Porphyria

Haemochromatosis

Histocytosis X diseases

Endocrine disorders:

Pituitary : Gigantism, acromegaly, hypopituitarism

Adrenal cortex : Addison's disease (Hypofunction)

Cushing's syndrome (Hyperfunction)

Parathyroid glands : Hyperparathyroidism.

Thyroid gland : (Hypothyroidism) Cretinism, myxedema

Pancreas : diabetes

Nutritional deficiency : vitamins : riboflavin, nicotinic acid, folic acid vitamin B12,  
vitamin C (Scurvy)

Blood disorders :

Red blood cell diseases

Deficiency anemias : (Iron deficiency, Plummer - Vinson syndrome, pernicious anemia)

Haemolytic anemias : (Thalassemia, sickle cell anemia, erythroblastosis fetalis)

Aplastic anemia

Polycythemia

White blood cell diseases

Neutropenia, cyclic neutropenia, agranulocytosis, infectious mononucleosis and leukemias

Haemorrhagic disorders :

Thrombocytopenia, purpura, hemophilia, Christmas disease and von Willebrand's disease

Disease of salivary glands :

Development disturbances : Aplasia, atresia and aberration

Functional disturbances : Xerostomia, ptyalism

Inflammatory conditions : Nonspecific sialadenitis, mumps, sarcoidosis Heerfort's syndrome (Uveoparotid fever), Necrotising sialometaplasia

Cysts and tumors : Mucocele, ranula, pleomorphic adenoma, mucoepidermoid carcinoma

Miscellaneous : sialolithiasis, Sjögren's syndrome, Mikulicz's disease and sialosis

Dermatological diseases with oral manifestations :

Ectodermal dysplasia (b) Hyperkeratosis palmarplantaris with periodontopathy (c) Scleroderma (d) Lichen planus including Gianotti's syndrome (e) Lupus erythematosus (f) Pemphigus (g) Erythema multiforme (h) Psoriasis

## Immunological diseases with oral manifestations

Leukemia (b) Lymphomas (c) Multiple myeloma (d) AIDS clinical manifestations, opportunistic infections, neoplasms (e) Thrombocytopenia (f) Lupus erythematosus (g) Scleroderma (h) dermatomyositis (I) Submucous fibrosis (j) Rheumatoid arthritis (k) Recurrent oral ulcerations including Behçet's syndrome and Reiter's syndrome

Allergy : Local allergic reactions anaphylaxis, serum sickness (local and systemic allergic manifestations to food drugs and chemicals)

Foci of oral infection and their ill effects on general health

Management of dental problems in medically compromised persons :

Physiological changes : Puberty, Pregnancy and menopause

The patients suffering with cardiac, respiratory, liver, kidney and bleeding disorders, hypertension, diabetes and AIDS. Post-irradiated patients.

Precancerous lesions and conditions

Nerve and muscle diseases :

Nerves : (a) Neuropraxia (b) Neurotmesis (c) Neuritis (d) Facial nerve paralysis including Bell's palsy, Heerfordt's syndrome, Melkersson Rosenthal syndrome and Ramsay Hunt syndrome (e) Neuroma (f) Neurofibromatosis (g) Frey's syndrome

Muscles : (a) Myositis ossificans (b) Myofascial pain dysfunction syndrome (c) Trismus

Forensic Odontology:

Medicolegal aspects of orofacial injuries

Identification of bite marks

Determination of age and sex

Identification of cadavers by dental appliances, Restorations and tissue remnants viz., antibiotics, chemotherapeutic agents, anti-inflammatory and analgesic drugs, astringents, mouth washes, styptics, demulcents, local surface anaesthetic, sialogogues, antisialogogues and drugs used in the treatment of malignancy.

## **Part - II BEHAVIOURAL SCIENCES AND ETHICS.**

### **Part - III ORAL RADIOLOGY**

Scope of the subject and history of origin

Physics of radiation : (a) Nature and types of radiations (b) source of radiations (c)

Production of X-rays (d) Properties of X-rays (e) Compton effect (f) Photoelectric effect

Radiation measuring units

Biological effects of radiation

Radiation safety and protection measures

Principles of image production

Radiographic techniques:

Intra-Oral : (a) Periapical radiographs (Bisecting and parallel techniques) (b) Bite wing radiographs (c) Occlusal radiographs

Extra - Oral : (a) Lateral projections of skull and jaw bones and paranasal sinuses Cephalograms (d) Orthopantomograph (e) Projections of temporomandibular joint and condyle of mandible (f) Projections for Zygomatic arches

Specialised techniques : (a) Sialography (b) Xeroradiography (c) Tomography

Factors in production of good radiographs :

K.V.P. and MA of X-ray machine (b) Filters (c) Collimations (d) Intensifying screens (e) Grids (f) X-ray films (g) Exposure time (h) Techniques (i) Dark room (j) Developer and fixer solutions (k) Film processing

Radiographic normal anatomical landmarks

Faculties radiographs and artefacts in radiographs

Interpretation of radiographs in various abnormalities of teeth, bones and other orofacial tissues

Principles of radiotherapy of oro-facial malignancies and complications of radiotherapy

Contrast radiography and basic knowledge of radio-active isotopes

Radiography in Forensic Odontology - Radiographic age estimation and post-mortem radiographic methods.

### **PRACTICALS / CLINICALS**

Student is trained to arrive at proper diagnosis by following a scientific and systematic procedure of history taking and examination of the orofacial region. Training is also imparted in management wherever possible. Training also shall be imparted on saliva diagnostic procedures. Training also shall be imparted in various radiographic procedures and interpretation of radiographs.

In view of the above each student shall maintain a record of work done, which shall be evaluated for marks at the time of University examination.

The following is the minimum of prescribed work for recording

- (a) Recording of detailed case histories of interesting cases .....10
- (b) Intra-oral radiographs (Periapical, bitewing, occlusal) .....25
- (c) Saliva diagnostic check as routine procedure.

**BOOKS RECOMMENDED:**

a) Oral Diagnosis, Oral Medicine & Oral Pathology

- Burkit - Oral Medicine \_ J.B. Lippincott Company
- Coleman - Principles of Oral Diagnosis - Mosby Year Book
- Jones - Oral Manifestations of Systemic Diseases - W.B. Saunders Company
- Mitchell - Oral Diagnosis & Oral Medicine
- Kerr - Oral Diagnosis
- Miller - Oral Diagnosis & Treatment
- Hutchinson - Clinical Methods
- Oral Pathology - Shafers
- Sonis. S.T., Fazio. R.C. and Fang. L. - Principles and practice of Oral Medicine

b) Oral Radiology

- White & Goaz - Oral Radiology - Mosby year Book
- Weahrman - Dental Radiology - C.V. Mosby Company
- Stafne - Oral Roentgenographic Diagnosis - W. B. Saunders

Co., c) Forensic Odontology

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

**ORTHODONTICS & DENTAL ORTHOPAEDICS**

**COURSE OBJECTIVE :**

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

Introduction, Definition, Historical Background, aims and Objectives of Orthodontics and  
Need for Orthodontics care

Growth and Development : In General a.

Definition

Growth spurts and Differential growth

Factors influencing growth and Development

Methods of measuring growth

Growth theories (Genetic, Sickers, Scotts, Moss's, Petrovics, Multifactorial)

Genetic and epigenetic factors in growth

Cephalocaudal gradient in growth

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.

Functional Development of Dental Arches and Occlusion

Factors influencing functional development of dental arches and occlusion

Forces of Occlusion

Wolfs law of transformation of bone

Trajectories of forces

Clinical Application of Growth and development

Malocclusion - In General

Concept of normal occlusion

Definition of malocclusion

Description of different types of dental, skeletal and functional malocclusion.

Classification of Malocclusion

Principle, description, advantages and disadvantages of classification of malocclusion  
by Angles simons, Lichers and Ackerman and Proffitts

Normal and Abnormal Function of Stomatognathic system

Etiology of Malocclusion

Definition, importance, classification, local and general etiological factors.

Etiology of following different types of malocclusion:

Midline diastema

Spacing

Crowding

Cross - Bite: Anterior / Posterior

Class III Malocclusion

Class II Malocclusion

7)Deep Bite

## 8) Open Bite

### Diagnosis And Diagnostic Aids

- a. Definition, Importance and classification of diagnostic aids
- b. Importance of case history and clinical examination in orthodontics
- c. Study Models: - Importance and uses - Preparation and preservation of study models
- d. Importance of intraoral X-rays in orthodontics
- e. Panoramic radiographs:- Principles, Advantages, disadvantages and uses
- f. Cephalometrics: Its advantages, disadvantages
  1. Definition
  2. Description and use of cephalostat
  3. Description and uses of anatomical landmarks lines and angles used in cephalometric analysis
  4. Analysis - Steiners, Downs, Tweeds, Ricketts-E- line
- g. Electromyography and its uses in orthodontics
- h. Wrist X-rays and its importance in orthodontics

### General Principles in Orthodontic Treatment Planning Of Dental And Skeletal Malocclusions

#### Anchorage In Orthodontics - Definition, Classification, Types and Stability Of Anchorage

#### Biomechanical Principles In Orthodontics Tooth movement a.

- Different types of tooth movements
- b. Tissue response to orthodontic force application
- c. Age factor in orthodontic tooth movement

#### Preventive Orthodontics a.

- Definition
- b. Different procedures undertaken in preventive orthodontics and their limitations.

#### Interceptive Orthodontics a.

- Definition
- b. Different procedures undertaken in interceptive orthodontics
- c. Serial extractions: Definition, indications, contra-indication, technique, advantages and disadvantages.
- d. Role of muscle exercises as an interceptive procedure

#### Corrective Orthodontics

- a. Definition, factors to be considered during treatment planning.
- b. Model analysis: Ponts, Ashley Howes, Bolton, Careys, Moyers Mixed Dentition Analysis

c. 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.

Orthodontic Appliances: General

Requisites for orthodontics appliances

Classification, indications of Removable and Functional Appliances

Methods of force application

Materials used in construction of various orthodontic appliances - uses of stainless steel, technical considerations in curing of acrylic, Principles of welding and soldering, fluxes and antfluxes.

e. Preliminary knowledge of acid etching and direct bonding,

Ethics

## **REMOVABLE ORTHODONTIC APPLIANCES**

Components of removable appliances

Different types of clasps and their uses

Different types of labial bows and their uses

Different types of springs and their uses

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, Beggs, straight wire.

## **EXTRAORAL APPLIANCES**

Headgears

chin cup

reverse pull headgears

## **MYOFUNCTIONAL APPLIANCES**

Definition and principles

Muscle exercise and their uses in orthodontics

Functional appliances:

Activator, Oral screens, Frankels function regulator, bionatar twin blocks, lip bumper

Inclined planes - upper and lower

Orthodontic Management of Cleft Lip And Palate

Principles of Surgical orthodontics

Brief Knowledge of correction of :

- a. Mandibular Prognathism and Retrognathism
- b. Maxillary Prognathism and Retrognathism c.

Anterior open bite and deep bite

- d. Cross bite

Principle, Differential diagnosis and methods of Treatment of : 1.

Midline diastema

2. Cross bite
3. Open bite
4. Deep bite
5. Spacing
6. Crowding
7. Class II -Division 1, Division 2
8. Class III Malocclusion - True and Psuedo Class III

Retention And Relapse

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

## **CLINICALS AND PRACTICALS IN ORTHODONTICS**

### **PRACTICAL TRAINING DURING II YEAR B.D.S.**

I. Basic wire bending exercises gauge 22 or 0.7 mm

Straightening of wires (4 Nos.)

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 0.7 mm

$\frac{3}{4}$  clasp (C-clasp)

Full clasp (Jacksons Crib)

Adams Clasp

Triangular clasp

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)

3. Buccal canine retractor

-self supported buccal canine  
retractor with

Sleeve - 5mm wire or 24 gauge

Sleeve - 19 gauge needle on any one side.

4. Palatal canine retractor on upper both  
sides Gauge 23 or 0.6mm

Labial Bow

Gauge 22 or 0.7 mm

One on both upper and lower

### **CLINICAL TRAINING DURING III YEAR B.D.S.**

NO. EXERCISE

Making upper Alignate impression

Making lower Alignate impression

Study model preparation

Model Analysis

Ponts analysis

Ashley Howes Analysis

Careys Analysis

Boltons Analysis

Moyers Mixed Dentition Analysis

### **CLINICAL TRAINING DURING FINAL YEAR B.D.S.**

No. EXERCISE

Case History taking

Case discussion

Discussion on the given topic

Cephalometric tracings

Downs Analysis

Steiners Analysis

Tweeds Analysis

### **PRACTICAL TRAINING DURING FINAL YEAR B.D.S**

Adams Clasp on Anterior teeth Gauge 0.7 mm

Modified Adams Clasp on upper arch Gauge 0.7 mm

High Labial bow with Apron spring on upper arch

(Gauge of Labial bow - 0.9 mm, Apron spring - 0.3 mm) 4. Coffin spring on upper arch Gauge 1 mm

Appliance construction in Acrylic

Upper and Lower Hawleys Appliance

Upper Hawleys with Anterior bite plane

Upper Habit breaking Appliance

Upper Hawleys with Posterior bite plane with .Z. Spring

Construction of Activator

Lower inclined plane / Catalan's Appliance

Upper Expansion plate with Expansion screw

### **RECOMMENDED AND REFERENCE BOOKS**

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

### **15. PAEDIATRIC & PREVENTIVE DENTISTRY**

#### **THEORY :**

INTRODUCTION TO PEDODONTICS & PREVENTIVE DENTISTRY

Definition, Scope, Objectives and Importance.

GROWTH & DEVELOPMENT

Importance of study of growth and development in pedodontics

Prenatal and Postnatal factors in growth & development

Theories of growth & development

Development of maxilla and mandible and related age changes

## DEVELOPMENT OF OCCLUSION FROM BIRTH THROUGH ADELOSCENCE

Study of variations and abnormalities

## DENTAL ANATOMY AND HISTOLOGY

Development of teeth and associated structures.

Eruption and shedding of teeth

Teething disorders and their management

Chronology of eruption of teeth

Differences between deciduous and permanent teeth

Development of dentition from birth to adolescence.

Importance of first permanent molar.

## DENTAL RADIOLOGY RELATED TO PEDODONTICS

## ORAL SURGICAL PROCEDURES IN CHILDREN

Indication and contraindications of extractions of primary and permanent teeth in children

Knowledge of Local and General Anesthesia

Minor surgical procedures in children

## DENTAL CARIES:

Historical background

Definition, aetiology and pathogenesis

Caries pattern in primary, young permanent and permanent teeth in children

Rampant caries, early childhood caries and extensive caries

Definition, aetiology, pathogenesis, Clinical features, Complications & Management

Role of diet and nutrition in Dental Caries

Dietary modifications and diet counseling

Caries activity, tests, caries prediction, caries susceptibility & their clinical application.

## GINGIVAL & PERIODONTAL DISEASES IN CHILDREN

Normal gingiva & periodontium in children

Definition, aetiology and Pathogenesis

Prevention & Management of gingival & Periodontal diseases

## 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

#### BEHAVIOUR MANAGEMENT

Definitions.

Types of behaviour encountered in the dental clinic

Non - pharmacological & pharmacological methods of Behaviour Management.

#### PEDIATRIC OPERATIVE DENTISTRY:

Principles of Pediatric Operative Dentistry

Modifications required for cavity preparation in primary and young permanent teeth

Various Isolation Techniques

Restorations of decayed primary, young permanent and permanent teeth in children using various restorative materials like Glass Ionomer, Composites and Silver Amalgam. Stainless steel, Polycarbonate & Resin Crowns.

#### PEDIATRIC ENDODONTICS

Principles & Diagnosis.

Classification of Pulpal Pathology in primary, young permanent & permanent teeth

Management of Pulpally involved primary, young permanent & permanent teeth

- Pulp capping - direct & indirect
- Pulpotomy
- Pulpectomy
- Apexogenesis
- Apexification

Obturation Techniques & material used for primary, young permanent & permanent teeth in children

#### TRAUMATIC INJURIES IN CHILDREN

Classifications & Importance

Sequelae & reaction of teeth of trauma

Management of Traumatized teeth.

#### PREVENTIVE & INTERCEPTIVE ORTHODONTICS:

Definitions.

Problems encountered during primary and mixed dentition phases and their management

Serial extractions.

Space management

## 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

## 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

## CONGENITAL ABNORMALITIES IN CHILDREN:

Definition, Classification, Clinical features & Management

## DENTAL EMERGENCIES IN CHILDREN & THEIR MANAGEMENT

## DENTAL MATERIAL USED IN PEDIATRIC DENTISTRY

## PREVENTIVE DENTISTRY :

Definition

Principles & Scope

Types of prevention

Different preventive measures in Pediatric Dentistry including pit and fissure sealants and caries vaccine.

## DENTAL HEALTH EDUCATION & SCHOOL DENTAL HEALTH PROGRAMMES.

## FLUORIDES :

Historical background

Systemic & Topical fluorides

Mechanism of action.

Toxicity & Management

Defluoridation techniques.

## CASE HISTORY RECORDING :

Outline of principles of examination, diagnosis & treatment planning.

## SETTING UP OF PEDIODONTIC CLINIC

## ETHICS

## PRACTICALS:

Following is the recommended clinical quota for under graduate students in the subject of pediatric & 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 oral hygiene measures like tooth brushing, flossing etc.

## BOOKS RECOMMENDED & REFERENCE:

Pediatric Dentistry (Infancy through Adolescence) - Pinkham.

2. Kennedy s Pediatric Operative Dentistry– Kennedy & Curzon.

3. Occlusal guidance in Pediatric Dentistry– Stephen H. Wei.

Clinical use of Fluorides - Stephen H. Wei

Pediatric Oral & Maxillofacial Surgery - Kaban

Pediatric Medical Emergencies - P.S. Whatt

Understanding of Dental Caries - Niki Foruk

An Atlas of Glass Ionomer cements - G. J. Mount

Clinical Pedodontics - Finn

Textbook of Pediatric Dentistry - Braham Morris

Primary Preventive Dentistry - Norman O. Harris

Handbook of Clinical Pedodontics - Kenneth D.

Preventive Dentistry - Forrester.

The Metabolism and Toxicity of Fluoride - Garry M. Whitford

Dentistry for the Child and Adolescence - Mc Donald.

Pediatric Dentistry - Damle S.G.

Behaviour Management - Wright

18 Pediatric Dentistry \_ Mathewson

Traumatic Injuries - andreason

Occlusal guidance in Pediatric Dentistry - Nakata

Pediatric Drug Therapy - Tomare

Contemporary Orthodontics - Proffit.

Preventive Dentistry - Depaola  
Metabolism & Toxicity of Fluoride - whitford G.M.  
Endodontic Practice - Grossman  
Principles of Endodontics - Munford  
Endodontics - Ingle  
Pathways of Pulp - Cohen  
Management of Traumatized anterior Teeth - Hargreaves.

## PUBLIC HEALTH DENTISTRY

### **GOAL :**

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

### **OBJECTIVES :**

#### **Knowledge :**

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

#### **Skill & Attitude :**

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

#### **Communication abilities :**

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

### **Syllabus :**

Introduction to Dentistry : Definition of Dentistry, History of dentistry, Scope, aims and objective dentistry.

#### **Public Health :**

Health & Disease : Concepts, Philosophy, Definition and Characteristics.

Public Health : Definition & Concepts, History of Public Health

General Epidemiology : Definition, objectives, methods

Environmental Health - Concepts, principles, protection, sources, purification environmental sanitation of water disposal of waste sanitation, then role in mass disorder.

Health Education : Definition, concepts, principles, methods, and health education aids.

Public health administration : Priority, establishment, manpower, private practice management, hospital management.

Ethics and Jurisprudence : Professional liabilities, negligence, malpractice, consents, evidence, contracts and methods of identification in forensic dentistry.

Nutrition in oral diseases

Behavioural science : Definition of sociology, anthropology and psychology and their in dental practice and community.

Health care delivery system : Centre and state, oral health policy, primary health care, national programmes health organizations.

## **Dental Public Health**

Definition and difference between community and clinical health

Epidemiology of dental diseases dental caries, periodontal diseases, malocclusion, dental fluorosis and oral cancer.

Survey procedures : Planning, implementation and evaluation, WHO oral health survey methods 1997, indices for dental diseases.

Delivery of dental care : Dental auxiliaries, operational and non-operational, incremental and comprehensive health care, school dental health.

Payments of dental care : Methods of payments and dental insurance, government plans.

Preventive Dentistry - definition, Levels, role of individual, Community and profession, fluorides in dentistry, plaque control programmes.

## **Research Methodology and Dental Statistics**

Health Information : Basic Knowledge of Computers, MS Office, Window 2000, Statistical Programmes

Research Methodology : Definition, types of research, designing a written protocol

Bio-Statistics : Introduction, collection of data, presentation of data, Measures of Central tendency, measures of dispersion, Tests of significance, Sampling and sampling techniques types, errors, bias, blind trails and calibration.

## **Practice Management**

Place and locality

Premises & Layout

Selection of equipments

Maintenance of records / accounts /

audit Dentist Act 1948 with amendment

Dental Council of India and State Dental Councils

Composition and responsibilities

Indian Dental Association

Head Office, State, Local and branches.

## **PRACTICALS / CLINICALS / FIELD PROGRAMME IN COMMUNITY DENTISTRY**

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

Understand the community aspects of dentistry.

To take up leadership role in solving community oral health programme.

Exercises :

Collection of statistical data (demographic) on population in India, birth rates, morbidity and mortality, literacy, per capita income

Incidence and prevalence of common oral diseases like dental caries, periodontal disease, oral cancer, fluorosis at national and international levels.

Preparation of oral health education material posters, models, slides, lecturers, play acting skits etc.

Oral health status assessment of the community using indices and WHO basic oral health survey methods

Exploring and planning setting of private dental clinics in rural, semi urban and urban locations, availment of finance for dental practices-preparing project report.

Visit to primary health centre-to acquaint with activities and primary health care delivery

Visit to water purification plant / public health laboratory / centre for treatment of western and sewage water.

Visit to schools-to assess the oral health status of school children, emergency treatment and health education including possible preventive care at school (tooth brushing technique demonstration and oral rinse programme etc.)

Visit to institution for the care of handicapped, physically, mentally or medically compromised patients

Preventive dentistry : in the department application of pit and fissure sealants, fluoride gel application procedure, A.R.T., Comprehensive health for 5 pts at least 2 patients.

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

## **SUGGESTED INTERNSHIP PROGRAMME IN COMMUNITY DENTISTRY**

### **AT THE COLLEGE**

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

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

The practice of chair side preventive dentistry including oral health education

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

Graduates posted for at least one month to familiarize in :

Survey methods, analysis and presentation of oral health assessment of school children and community independently using WHO basic oral health survey methods.

Participation in rural oral health education programmes

Stay in the village to understand the problems and life in rural areas.

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

Examination Pattern

Index : Case History

Oral hygiene indices simplified - Green and vermilion

Silness and Loe index for Plaque

Loe and Silness index for gingival

CPI

DMF : T & S, df:t and s

Deans fluoride index

Health Education

Make on - Audio visual aid

Make a health talk

Practical work

Pit and fissure sealant

Topical fluoride application

**BOOKS RECOMMENDED & REFERENCE :**

Dentistry Dental Practice and Community by David F. Striffler and Brain A. Burt, Edn. - 1983, W.B. Saunders Company

Principles of Dental public health by James Morse Dunning. IV<sup>th</sup> Edition, 1986, Harward University Press.

Dental Public Health and Community Dentistry Ed by Anthony Jong Publication by the C. V. Mosby Company 1981

Community Oral Health - A system approach by Patricia P. Cormier and Jouce I. Levy published by Appleton Century -Crofts / New York - 1981

Community Dentistry - A problem oriented approach by P.C. Dental Hand book series Vol 8 by Stephen L. Silverman and Ames F. Tryon, Series editor Alvin F. Gardner, PSG publishing company Inc. Littleton Massachuseltts, 1980

Dental Public Health- An Introduction to Community Dentistry. Edition by Geoffrey L. Slack and Brain Burt, Published by John Wrigth and sons Bristol, 1980

Oral Health Surveys - Basic methods, 4<sup>th</sup> edition, 1997, published by W.H.O. Geneva available at the regional office, New Delhi.

Preventive Medicine and Hygiene - By Maxcy and Rosenau, published by Appleton Century Crofts, 1986.

Preventive Dentistry - by J.O. Forrest published by John Wright and sons Bristol, 1980

Preventive Dentistry by Murray, 1997

Text Book of Preventive and Social Medicine by Park and Park, 14<sup>th</sup> Edition.

Community Dentistry by Dr. Soben Peter

Introduction to Bio-statistics by B.K. Mahajan

Research Methodology and Bio-statistics by

Introduction to statistical Methods by Garewal.

**PERIODONTOLOGY**

**OBJECTIVES :**

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

The student shall develop attitude to impart the preventive measures namely, the prevention of periodontal diseases and prevention of the progress of the disease. The student shall also develop an attitude to perform the treatment with full aseptic precautions; shall develop an

attitude to prevent iatrogenic diseases; to conserve the tooth to the maximum possible time by maintaining periodontal health and to refer the patients who require specialist's care

Introduction : Definition of Periodontology, Periodontics, Periodontia, Brief historical background, Scope of Periodontics

Development of perio-dental tissues, micro structural anatomy and biology of periodontal tissues in detail Gingiva . Junctional epithelium in detail, Epithelial

Mesenchymal Interaction, Periodontal, ligament Cementum, Alveolar bone.

Defensive mechanisms in the oral cavity : Role of Epithelium, Gingival fluid, Saliva and other defensive mechanisms in the oral environment

4.	Age changes in periodontal structures and their significance in Geriatric dentistry	Age changes in teeth and periodontal structures and their association with periodontal diseases
5.	Classification of periodontal diseases	<p>Need for classification, scientific basis of 1 classification</p> <p>Classification of gingival and periodontal disease as described in world workshop 1989</p> <p>Gingivitis :</p> <p>Plaque associated, ANUG, steroid hormone influenced Medication influenced, Desquamative gingivitis, other forms of gingivitis as in nutritional deficiency, bacterial and viral infections etc.</p> <p>Periodontitis :</p> <p>Adult periodontitis, Rapidly progressive periodontitis A &amp; B, Juvenile periodontitis (localized, generalized, and post juvenile), Prepubertal periodontitis Refractory periodontitis</p>
6	Gingival diseases	<p>Localized and generalized gingivitis, papillary, marginal and diffuse gingivitis</p> <p>Etiology, Pathogenesis, clinical signs, symptoms and management of</p> <p>i) Plaque associated gingivitis</p> <p>ii) Systemically aggravated gingivitis (sex hormones, drugs and systemic diseases )</p> <p>iii) ANUG</p> <p>iv) Desquamative gingivitis-Gingivitis associated with lichen planus, pemphigoid, pemphigus and other vesiculobullous lesions</p> <p>v) Allergic gingivitis</p> <p>vi) Infective gingivitis-Herpetic, bacterial and candidial</p> <p>vii) Pericoronitis</p> <p>viii) Gingival enlargement (classification and differential diagnosis)</p>
7	Epidemiology of periodontal diseases	<ul style="list-style-type: none"> <li>- Definition of index, incidence, prevalence, epidemiology, endemic, epidemic and pandemic</li> <li>- classification of indices (Irreversible and reversible )</li> <li>- Deficiencies of earlier indices used in Periodontics</li> </ul>

		<ul style="list-style-type: none"> <li>- Detailed understanding of Silness &amp; Loe Plaque Index, Loe &amp; Silness Gingival Index, CPITN &amp; CPI</li> <li>- Prevalence of periodontal diseases in India and other countries</li> <li>- 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.</li> </ul>
8	Extension of inflammation from gingiva	Mechanism of spread of inflammation from gingival area to deeper periodontal structures factors that modify the spread
9.	Pocket	Definition, signs and symptoms, classification, pathogenesis, histopathology, root surface changes and contents of the pocket.
10.	Etiology	<ul style="list-style-type: none"> <li>- Dental plaque (Biofilm)</li> <li>- Definition, New concept of biofilm</li> <li>- Types composition, bacterial colonization, growth, maturation and disclosing agents</li> <li>- Role of dental plaque in periodontal diseases</li> <li>- Plaque microorganism in detail and bacteria associated with periodontal diseases</li> <li>- Plaque retentive factors</li> <li>- Materia alba</li> <li>- Food debris</li> <li>- Calculus</li> <li>- Definition</li> <li>- Types, composition, attachment, theories of formation</li> <li>- Role of calculus in disease</li> </ul> <p>Food impaction</p> <ul style="list-style-type: none"> <li>- Definition</li> <li>- Types, Etiology</li> <li>- Hirschfelds classification</li> <li>- Signs, symptoms &amp; sequelae of treatment</li> </ul> <p>Trauma from Occlusion</p> <ul style="list-style-type: none"> <li>- Definition, Types</li> <li>- Histopathological changes</li> <li>- Role in periodontal disease</li> <li>- Measures of management in brief</li> </ul> <p>Habits</p> <ul style="list-style-type: none"> <li>- Their periodontal significance</li> <li>- Bruxism &amp; parafunctional habits, tongue thrusting, lip biting, occupational habits.</li> </ul> <p>IATROGENIC FACTORS</p> <p>Conservative Dentistry</p> <ul style="list-style-type: none"> <li>- Restorations</li> <li>- Contact point, marginal ridge, surface roughness, overhanging restorations, interface between restoration and teeth</li> </ul> <p>Prosthodontics</p> <ul style="list-style-type: none"> <li>- Interrelationship</li> <li>- Bridges and other prosthesis pontics (types) surface contour, relationships of margins to</li> </ul>

		<p>the perodontium, Gingival protection theory, muscle action theory and theory of access to oral hygiene.</p> <p>Orthodontics</p> <ul style="list-style-type: none"> <li>- Interrelationship, removable appliances &amp; fixed appliances</li> <li>- Retention of plaque, bacterial changes</li> </ul> <p>Systemic diseases</p> <ul style="list-style-type: none"> <li>- Diabetes, sex hormones, nutrition (Vit.C &amp; proteins)</li> <li>- AIDS &amp; periodontium</li> <li>- Hemorrhagic disease, Leukemia, clotting factor disorders, PMN disorders</li> </ul>
11.	Risk factors	<ul style="list-style-type: none"> <li>- Definition, Risk factors for periodontal diseases 1</li> </ul>
12.	Host response	<ul style="list-style-type: none"> <li>- Mechanism of initiation and progression of 3 periodontal diseases</li> <li>- Basic concepts about cells, Mast cells, neutrophils, macrophages, lymphocytes, immunoglobulin, complement system, immune mechanisms &amp; cytokines in brief</li> <li>- Stages in gingivitis - initial, early, established and advanced</li> <li>- Periodontal disease activity, continuous paradigm, random burst &amp; asynchronous multiple burst hypothesis</li> </ul>
13.	Periodontitis	<ul style="list-style-type: none"> <li>- Etiology, histopathology, clinical signs &amp; 6 symptoms, diagnosis and treatment of adult periodontitis</li> <li>- Periodontal abscess; definition, classification, pathogenesis, differential diagnosis and treatment</li> <li>- Furcation involvement, Glickman's classification, prognosis and management</li> <li>- Rapidly progressive periodontitis</li> <li>- Juvenile periodontitis : Localised and generalized</li> <li>- Post juvenile periodontitis</li> <li>- Periodontitis associated with systemic diseases</li> <li>- Refractory periodontitis</li> </ul>
14.	Diagnosis	<ul style="list-style-type: none"> <li>- Routine procedures, methods of probing, types of probes (According case history)</li> <li>- Halitosis: Etiology and treatment. Mention advanced diagnostic aids and their role in brief.</li> </ul>
15.	Prognosis	<ul style="list-style-type: none"> <li>- Definition, types, purpose and factors to be taken into consideration</li> </ul>
16.	Treatment plan	<ul style="list-style-type: none"> <li>- Factors to be considered</li> </ul>
17.	Periodontal Therapy	<p>A. General principles of periodontal therapy. Phase I, II, III, IV therapy  Definition of periodontal regeneration, repair, new attachment and reattachment</p> <p>B. Plaque control</p> <p>i. Mechanical tooth brushes, interdental cleaning aids, dentifrices</p>

		ii. Chemical ; classification and mechanism of action of each & Pocket irrigation
18.	Pocket eradication procedures	<ul style="list-style-type: none"> <li>- Scaling &amp; root planning</li> <li>- indications</li> <li>- Aims &amp; objectives</li> <li>- Healing following root planning</li> <li>- Hand instruments, sonic, ultrasonic &amp; peizo electric scalers</li> <li>- curettage &amp; present concepts</li> <li>- definition</li> <li>- indications</li> <li>- Aims &amp; objectives</li> <li>- procedures &amp; healing response</li> <li>- Flap surgery</li> <li>- Definition</li> <li>- Types of flaps, Design of flaps, papilla preservation</li> <li>- Indications &amp; contraindications</li> <li>- Armamentarium</li> <li>- Surgical procedure &amp; healing response</li> </ul>
19.	Osseous Surgery	<p>Osseous defects in periodontal disease</p> <ul style="list-style-type: none"> <li>- Definition</li> <li>- Classification</li> <li>- Surgery : resective, additive osseous surgery (osseous grafts with classification of grafts)</li> <li>- Healing responses</li> <li>- Other regenerative procedures ; root conditioning</li> <li>- Guided tissue regeneration</li> </ul>
20.	Mucogingival surgery & periodontal plastic surgeries	<p>Definition</p> <p>Muscogingival problems : etiology, classification of gingival recession (P.D. Miller Jr. and Sullivan and atkins)</p> <p>Indications &amp; objectives</p> <p>Gingival extension procedures : lateral predicle graft, frenectomy, frenotomy</p> <p>Crown lengthening procedures</p> <p>Periodontal microsurgery in brief</p>
21.	Splints	<ul style="list-style-type: none"> <li>- Periodontal splints</li> <li>- Purpose &amp; Classification</li> <li>- Principles &amp; splinting</li> </ul>
22.	Hypersensitivity	Causes, Theories & Management
23.	Implants	<p>Definition, types, scope &amp; biomaterials uses</p> <p>Periodontal consideration : Such as implant-bone interface, implant - gingival interface, implant failure, peri implantitis &amp; management</p>
24.	Maintenance phase (SPT)	<ul style="list-style-type: none"> <li>- Aims, objective and principles</li> <li>- Importance</li> <li>- Procedures</li> <li>- Maintenance of implants</li> </ul>
25.	Pharmaco - therapy	<ul style="list-style-type: none"> <li>- Periodontal dressings</li> <li>- antibiotics &amp; anti-inflammatory drugs</li> <li>- Local drug delivery systems</li> </ul>
26.	Periodontal management of medically	Topics concerning periodontal management of

	Compromised patients	medically compromised patients
27.	Inter-disciplinary care	<ul style="list-style-type: none"> <li>- Pulpo-periodontal involvement</li> <li>- Routes of spread of infection</li> <li>- Simons classification</li> <li>- Management</li> </ul>
28.	Systemic effects of periodontal diseases in brief	- Cardiovascular diseases Low birth weight babies etc.
29.	Infection control protocol	Sterilization and various aseptic procedures
30.	Ethics	

### **TUTORIALS DURING CLINICAL POSTING ;**

Infection control

Periodontal instruments

Chair position and principles of instrumentation

Maintenance of instruments (sharpening)

Ultrasonic, Peizoelectric and sonic scaling - demonstration of technique

Diagnosis of periodontal disease and determination of prognosis

Radiographic interpretation and lab investigations

Motivation of patients - oral hygiene instructions

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

### **DEMONSTRATIONS :**

History taking and clinical examination of the patients

Recording different indices

Methods of using various scaling and surgical instruments

Polishing the teeth

Bacterial smear taking

Demonstration to patients about different oral hygiene aids

Surgical procedures - gingivectomy, gingivoplasty and flap operations

Follow up procedures, post operative care and supervision

### **REQUIREMENTS:**

Diagnosis, treatment planning and discussion and total periodontal treatment - 25 cases

Dental scaling, oral hygiene instructions - 50 complete cases / equivalent

Assistance in periodontal surgery - 5 cases

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 :**

Glickman's Clinical Periodontology - Carranza

**REFERENCE BOOKS**

Essentials of Periodontology and periodontics - Torquil MacPhee

Contemporary periodontics - Cohen

Periodontal therapy - Goldman

Orban's periodontics - Orban

Oral Health Survey - W.H.O.

Preventive Periodontics - Young and Stiffler

Public Health Dentistry - Slack

Advanced Periodontal Disease - John Prichard

Preventive Dentistry - Forrest

Clinical Periodontology - Jan Lindhe

Periodontics - Baer & Morris.

**18. PROSTHODONTICS AND CROWN & BRIDGE**

**Complete Dentures**

Applied Anatomy and Physiology

Introduction

Biomechanics of the edentulous state

Residual ridge resorption

Communicating with patient

Understanding the patients.

➤ Mental Attitude

Instructing the patient

C. Diagnosis and treatment planning for patients

With some teeth remaining

With no teeth remaining

Systemic status

Local factor

The geriatric patients

d) Diagnostic procedures

Articulators - discussion

Improving the patients denture foundation and ridge relation - an overview.

Pre-operative examination

Initial hard tissue & soft tissue procedures

Secondary hard and soft tissue procedure

Implant procedure

Congenital deformities

Postoperative procedure.

Principles of Retention, Support and Stability

Impressions - detail

Muscles of facial expression

Biological considerations for maxillary and mandibular impression including anatomy landmark and their interpretation.

Impression objectives

Impression materials

Impression techniques

Maxillary and mandibular impression procedures.

Preliminary impressions

final Impressions

Laboratory procedures involved with impression making (Beading & Boxing, and cast preparation)

Record bases and occlusion rims - in detail

Materials & techniques

useful guidelines and ideal parameters

recording and transferring bases and occlusal rims

Biological consideration in jaw relation & jaw movements - craniomandibular relations.

Mandibular movements

Maxillo - mandibular relation including vertical and horizontal jaw relations.

Concept of occlusion - discuss in brief

Relating the patient to the articulator

Face bow types and uses - discuss in brief

Face bow transfer procedure - discuss in brief

Recording maxillo mandibular relation

Vertical relations

Centric relation records

Eccentric relation records.

Lateral relation records

Tooth selection and arrangement

Anterior teeth

Posterior teeth

Esthetic and functional harmony

Relating inclination of teeth to concept of occlusion - in brief

Neurocentric concept

Balanced occlusal concept

Trial dentures

Laboratory procedures

Wax contouring

Investing of dentures

Preparing of mold

Preparing & Packing acrylic resin

Processing of dentures

Recovery of dentures

Lab remount procedures

Recovering the complete denture from the cast

Finishing and polishing the complete denture

Plaster cast for clinical denture remount procedure

Denture insertion

Insertion procedures

Clinical errors

Correcting occlusal disharmony

Selective grinding procedures.

Treating problems with associated denture use - discuss in brief (tabulation / flow chart form)

Treating abused tissues - discuss in brief

Relining and rebasing of dentures - discuss in brief

Immediate complete dentures construction procedure - discuss in brief

The single complete denture - discuss in brief

Overdentures denture - discuss in brief

Dental implants in complete denture - discuss in brief.

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

Definition

Diagnosis (of the particular situation / patient selection / treatment planning)

Types / classification

Materials

Methodology - Lab / Clinical

Advantages & disadvantages

Indication, contraindications

Maintenance phase

Oral Implantology

Ethics

## **Removable Flexible Dentures**

Introduction

- Terminologies and scope

Classification

Examination, Diagnosis & Treatment planning and evaluation of diagnostic data

Components of a removable partial

- Major connectors,
- Minor connectors
- Rest and rest seats

Components of a Removable Partial Denture

- Direct retainers
- Indirect retainers
- Tooth replacement

Principles of Removable Partial Denture Design

Survey and design - in brief

- Surveyors
- Surveying
- Designing

Mouth preparation and masters cast

Impression materials and procedures for removable partial dentures

Preliminary jaw relation and esthetic try in for some anterior replacement teeth

Laboratory procedures for framework construction - in brief.

Fitting the framework - in brief.

Try - in of the partial denture - in brief

Completion of the partial denture - in brief

Inserting the Removable Partial Denture - in brief

Postinsertion observations.

Temporary Acrylic Partial Dentures.

Immediate Removable Partial Denture.

Removable Partial Dentures opposing Complete denture.

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

Definition

Diagnosis (of the particular situation / patient selection / treatment planning)

Types / Classification

Materials

Methodology - Lab / Clinical

Advantages & disadvantages

Indications, contradictions

Maintenance Phase

## **Fixed Partial Dentures**

### **Topics To Be Covered In Detail**

Introduction

Fundamentals of occlusion - in brief.

Articulators - in brief

Treatment planning for single tooth restorations.

Treatment planning for the replacement of missing teeth including selection and choice of abutment teeth.

Fixed partial denture configurations.

Principles of tooth preparations.

Preparations for full veneer crowns - in detail.

Preparations for partial veneer crowns - in brief

Provisional Restorations

Fluid Control and Soft Tissue Management

Impressions

Working Casts and Dies

Wax patterns  
Pontics and Edentulous Ridges  
Esthetic Considerations  
Finishing and Cementation

### **Topics To Be Covered In Brief -**

Solder Joints and Other Connectors  
All - Ceramic Restorations  
Metal - Ceramic Restorations  
Preparations of intracoronar restorations.  
Preparations for extensively damaged teeth.  
Preparations for periodontally weakened teeth  
The Functionally Generated Path Technique  
Investing and Casting  
Resin - Bonded Fixed Partial Denture

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

Definition  
Diagnosis (of the particular situation / patient selection / treatment planning)  
Types / Classification  
Materials  
Methodology - Lab / Clinical  
Advantages & disadvantages  
Indications, contradictions  
Maintenance Phase

### **RECOMMENDED BOOKS :**

Syllabus of Complete denture by - Charles M. Heartwell Jr. and Arthur O. Rahn.  
Bouchers „Prosthodontic treatment for edentulous patients.“  
Essentials of complete denture prosthodontics by - Sheldon Winkler.  
Maxillofacial prosthetics by - Willam R. Laney.  
McCrakens Removable partial Prosthodontics  
Removable partial prosthodontics by - Ernest L. Miller and Joseph E. Grasso.

## AESTHETIC DENTISTRY

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

Introduction and scope of esthetic dentistry

Anatomy & physiology of smile

Role of the colour in esthetic dentistry

Simple procedures (rounding of central incisors to enhance esthetics appearance)

Bleaching of teeth

Veneers with various materials

Preventive and interceptive esthetics

Ceramics

Simple gingival contouring to enhance the appearance

Simple clinical procedures for BDS students

### **Recommended books:**

Esthetic guidelines for restorative dentistry; Scharer & others

Esthetics of anterior fixed prosthodontics; Chiche (GJ) & Pinault (Alain)

Esthetic & the treatment of facial form, Vol 28; Mc Namara (JA)

## FORENSIC ODONTOLOGY (30 HRS OF INSTRUCTION)

### Definition

Forensic is derived from the Latin word forum, which means court of law. Odontology literally implies the study of teeth. Forensic odontology, therefore, has been defined by the 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:

Have sound knowledge of the theoretical and practical aspects of forensic odontology.

Have an awareness of ethical obligations and legal responsibilities in routine practice and forensic casework.

Be competent to recognize forensic cases with dental applications when consulted by the police, forensic pathologists, lawyers and associated professionals.

Be competent in proper collection of dental evidence related to cases of identification, ethnic and sex differentiation, age estimation and bite marks.

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

## Curriculum for forensic odontology

### Introduction to forensic dentistry

- Definition and history
- Recent developments and future trends

### Overview of forensic medicine and toxicology

- Cause of death and postmortem changes
- Toxicological manifestations in teeth and oral tissues

### Dental identification

- Definition
- Basis for dental identification
- Postmortem procedures
- Dental record compilation and interpretation
- Comparison of data, and principles of report writing
- Identification in disasters and handling incinerated remains
- Postmortem changes to oral structures

### Maintaining dental records

- Basic aspects of good record - keeping
- Different types of dental records
  - Dental charts
  - Dental radiographs
  - Study casts
  - Denture marking
  - Photographs
- Dental notations
- Relevance of dental records in forensic investigation

### Age estimation

- Age estimation in children and adolescents
  - Advantages of tooth calcification over eruption in estimating age
  - Radiographic methods of Schour & Massler, Demirjian et al
- Age estimation in adults

○

Histological methods - Gustafson's six variables and Johanson's modification,

Bang & Ramms dentine translucency

- Radiographic method of Kvaal et al

- Principles of report writing

#### Sex differentiation

- Sexual dimorphism in tooth dimensions (Odontometrics)

#### Ethnic variations (racial differences) in tooth morphology

- Description of human population groups
- Genetic and environmental influences on tooth morphology
- Description of metric and non-metric dental features used in ethnic differentiation

#### Bite mark procedures

- Definition and classification
- Basis for bite mark investigation
- Bite mark appearance
- Macroscopic and microscopic ageing of bite marks
- Evidence collection from the victim and suspect of bite mark
- Analysis and comparison
- Principles of report writing
- Animal bite investigation

#### Dental DNA methods

- Importance of dental DNA evidence in forensic investigations
- Types of DNA and dental DNA isolation procedures
- DNA analysis in personal identification
- Gene-linked sex dimorphism
- Population genetics

#### Jurisprudence and ethics

- Fundamentals of law and the constitution
- Medical legislation and statutes (Dental and /medical Council Acts, etc)
- Basics of civil law (including torts, contracts and consumer protection act)
- Criminal and civil procedure code (including expert witness requirement)
- Assessment and quantification of dental injuries in courts of law
- Medical negligence and liability
- Informed consent and confidentiality
- Rights and duties of doctors and patients
- Medical and dental ethics (as per Dentists Act)

#### Theory session 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, equipment and feasibility.

Approach to teaching forensic odontology

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

Preclinical stream

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

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

Clinical stream

- Dental identification
- Maintaining dental records
- Radiographic age estimation

- Medical jurisprudence and ethics

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

### **ORAL IMPLANTOLOGY (30 hrs of instruction)**

#### **INTRODUCTION TO ORAL IMPLANTOLOGY**

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

History of implants, their design & surface characteristics and osseo-integration

Scope of oral & maxillofacial implantology & terminologies

A brief introduction to various implant systems in practice

Bone biology, Morphology, Classification of bone and its relevance to implant treatment and bone augmentation materials.

Soft tissue considerations in implant dentistry

Diagnosis & treatment planning in implant dentistry

Case history taking / Examination / Medical evaluation / Orofacial evaluation / Radiographic evaluation / Diagnostic evaluation / Diagnosis and treatment planning / treatment alternatives / Estimation of treatment costs / patient education and motivation

Pre surgical preparation of patient

Implant installation & armamentarium for the Branemark system as a role model

First stage surgery - Mandible - Maxilla

Healing period & second stage surgery

Management of surgical complications & failures

General considerations in prosthodontic reconstruction & Bio mechanics

Prosthodontic components of the Branemark system as a role model

Impression procedures & Preparation of master cast

Jaw relation records and construction of suprastructure with special emphasis on occlusion for osseointegrated prosthesis

Management of prosthodontic complications & failures

17. Recall & maintenance phase.

Criteria for success of osseointegrated implant supported prosthesis

### **SUGGESTED BOOKS FOR READING**

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

### **BEHAVIOURAL SCIENCES (20 hrs of instruction)**

#### **GOAL:**

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

For all round development of his personality

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 counseling techniques, and improving patients compliance behaviour.

#### **OBJECTIVES:**

##### **KNOWLEDGE & UNDERSTANDING:**

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

Comprehend different aspects of normal behaviour like learning, memory, motivation, personality & intelligence.

Recognise difference between normal and abnormal behaviour.

Classify psychiatric disorders in dentistry.

Recognise clinical manifestations of dental phobia, dental anxiety, facial pain orofacial manifestations of psychiatric disorders, and behavioural problems in children. Addictive disorders, psychological disorders in various dental departments.

Should have understanding of stress in dentistry and knowledge of simple counseling techniques.

Have some background knowledge of interpersonal, managerial and problem solving skills which are an integral part of modern dental practice.

Have knowledge of social context of dental care.

## **SKILLS**

The student shall be able to:

Interview the patient and understand different methods of communication skills in dentist - patient relationship.

Improve patients compliance behaviour.

Develop better interpersonal, managerial and problem solving skills.

Diagnose and manage minor psychological problems while treating dental patients.

## **INTEGRATION:**

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

Sensory process & perception perceptual process - clinical applications.

Attention - Definition - factors that determine attention. Clinical application.

Memory - Memory process - Types of memory, Forgetting:

Methods to improve memory, Clinical assessment of memory & clinical applications.

Definition - Laws of learning

Type of learning. Classical conditioning, operant conditioning, cognitive learning, Insight learning, social learning, observational learning, principles of learning - Clinical application.

Intelligence - Definition: Nature of intelligence stability of intelligence

Determinants of intelligence, clinical application

Thinking - Definition: Types of thinking, delusions, problem solving 8)

Motivation - Definition: Motive, drive, needs classification of motives

Emotions - Definition differentiation from feelings - Role of hypothalamus, Cerebral cortex, adrenal glands ANS. Theories of emotion, Types of emotions.

Personality. Assessment of personality: Questionnaires, personality inventory, rating scales, Interview projective techniques - Rorschach ink blot test, RAT, CAT

## **SOCIOLOGY:**

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

## **REFERENCE BOOKS:**

General psychology - S. K. Mangal

General psychology - Hans Raj, Bhatia

General psychology - Munn

Behavioural Sciences in Medical practice - Manju Mehta

Sciences basic to psychiatry - Basanth Puri & Peter J Tyrer

## **ETHICS (20 hrs. of instruction)**

### **Introduction:**

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

### **Course content:**

Introduction to ethics -

what is ethics?

What are values and norms?

How to form a value system in ones 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

Identifying areas of value - conflict, setting of

priorities Working our criteria towards decisions

## **Recommended Reading:**

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

Maj Gen (Retd.) P. N. AWASTHI, Secy.

## **Following name has recommended by Board of Studies & Faculty of Dentistry**

1. Oral & Maxillofacial Pathology - 2<sup>nd</sup> edition, 2004 by Neville, Damm, Allen, Bonequot ,  
Publication – Elsevier
2. Oral Medicine & Radiology : Oral Radiology - White and Pharogh
3. Essentials of Medical Microbiology & Dental Students - 4<sup>th</sup> edition-Bhatia R. B. &  
Ichhpujani R.L.

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## **SYLLABUS OF PART – I**

### **SUBJECT: CONSERVATIVE DENTISTRY AND ENDODONTICS**

#### **ANATOMY**

1. Gross anatomy of the face:
  - a. Muscles of the face and neck including muscles of mastication and deglutition, muscles of facial expression and Facial spaces. EMBRYOLOGY: Development of face, paranasal sinuses and the associated structures and their anomalies.
  - b. Functional anatomy of mastication, deglutition and speech
  - c. Anatomy of Mandible and maxilla:
2. General and histological structure of bones.
3. TMJ anatomy and function
4. Oral Cavity:
  - 4 a. Vestibule and oral cavity proper
  - 4b. Tongue : development, anatomy, innervations, blood supply and histology
  - 4c. Palate –: development, anatomy, innervations, blood supply and histology
5. Anatomy of Nasal Cavity, Nasal septum ,Lateral wall of nasal cavity and Paranasal air sinuses
6. Saliva and Salivary glands :
  - 6a. Anatomic considerations. Salivary glands – structure, function, clinical considerations
  - 6b. Saliva composition and applied aspects.
7. Triangles of the neck with special reference to Carotid, Digastric triangles and midline structures.
8. Arterial and venous drainage of head and neck
9. Classification of cranial nerves and autonomic nervous system of head and neck with special emphasis on Facial and Trigeminal Nerves
10. General Anatomy : Jugular system : Internal jugular External jugular
11. TEETH

- Detailed anatomy of deciduous and permanent teeth, general consideration in applied anatomy of permanent dentition, form, function, developmental anomalies.
- Internal anatomy of permanent teeth and its significance
- Enamel – development and composition, physical characteristics, chemical properties, histological features. Age changes and clinical considerations
- Dentin – development, physical and chemical properties, structure type of dentin, innervations, age and functional changes.
- Pulp – development, histological structures, innervations, functions, regressive changes, clinical considerations.
- Cementum – composition, cementogenesis, structure, function, clinical consideration. •
- Periodontal ligament – development, structure, function and clinical consideration
- 12. Development and Eruption of teeth.

13. Contacts, contours and Occlusion

14 HISTOLOGY: 1. Study of epithelium of oral cavity and the respiratory tract 2. Connective tissue 3. Muscular tissue 4. Nervous tissue 5. Blood vessels 6. Cartilage 7. Bone and tooth 72 8. Tongue 9. Salivary glands 10. Tonsil, thymus, lymph nodes

## **II. Physiology**

**General Physiology:** Cell , Body Fluid Compartments - Classification - Composition and Cellular transport , Resting Membrane Potential and action potential

### **Muscle Nerve Physiology:**

- Structure of a neuron and properties of nerve fibres
- Structure of muscle fibres and properties of muscle fibres
- Neuromuscular transmission
- Mechanism of muscle contraction

- Taste and Taste buds and pathways of taste sensation.

### **Blood:**

- Composition, volume, functions, blood groups, RBC and Haemoglobin
- WBC – Structure and functions
- Platelets – functions and applied aspects
- Plasma proteins
- Blood Coagulation with applied aspects
- Blood transfusion, circulation, heart, pulse, blood pressure, shock.
- Lymph and applied aspects

### **Respiratory System:**

- Respiration and respiration control
- Anoxia, hypoxia, asphyxia, artificial respiration .Hypoxia, effects of increased barometric pressure and decreased barometric pressure

### **Cardio-Vascular System:**

- Cardiac Cycle and pulse.
- Regulation of heart rate/ Stroke volume / cardiac output / blood flow and Electrocardiogram
- Regulation of blood pressure.
- Shock, hypertension, cardiac failure.

### **Excretory System:**

- Renal function tests and their significance.

### **Gastro Intestinal System**

- Composition, functions and regulation of: Saliva and Gastric juice

- Mastication and deglutition

### **Endocrine System:**

- Hormones – classification and mechanism of action.
- General principles of endocrine activity and disorders relating to pituitary, thyroid, parathyroid, adrenals including pregnancy and lactation.
- Thyroid and Parathyroid hormones
- Pancreatic hormones
- Adrenal hormones

### **Central Nervous System:**

- Ascending tract with special references to pain pathway
- SPECIAL SENSES: Taste, Gustation and Olfaction

### **Applied Physiology:**

- Mastication, deglutition, digestion and assimilation, fluid and electrolyte balance.
- Physiology of saliva – composition, function, clinical significance
- Clinical significance of vitamins, diet and nutrition – balanced diet.
- Physiology of pain, sympathetic and Para sympathetic nervous system, pain pathways, physiology of pulpal pain, Odontogenic and non Odontogenic pain, pain disorders – typical and atypical.

- **Biochemistry:**

- Osmotic pressure, Electrolyte dissociation, Oxidation and Reduction.
- Carbohydrates – Disaccharides specifically maltose, lactose, sucrose - Digestion of starch/absorption of glucose - Metabolism of glucose, specifically glycolysis, TCA cycle, gluconeogenesis - Blood sugar regulation - Glycogen storage regulation - Glycogen storage diseases - Galactosemia and fructosemia
- Lipids - Fatty acids- Essential/non essential - Metabolism of fatty acids- oxidation, ketone body formation, utilization ketosis - Outline of cholesterol metabolism- synthesis and products formed from cholesterol

- Protein - Amino acids- essential/non essential, complete/ incomplete proteins - Transamination/ Deamination
- Vitamins and their metabolic role- specifically vitamin A, Vitamin C, Vitamin D, Thiamin, Riboflavin, Niacin, Pyridoxine

## **Pathology:**

### **1. Inflammation and Repair**

General Principles of Inflammation and Repair

- Repair and regeneration, necrosis and gangrene
- Role of complement system in acute inflammation
- Role of arachidonic acid and its metabolites in acute inflammation
- Growth factors in acute inflammation
- Role of molecular events in cell growth and intercellular signaling cell surface receptors
- Role of NSAIDS in inflammation
- Cellular changes in radiation injury and its manifestations

### **2. Hemostasis:**

- Role of Endothelium in thrombo-genesis
- Arterial and venous thrombi , Disseminated Intravascular Coagulation
- Shock: •Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock, circulatory disturbances, ischemic hyperemia, venous congestion, oedema, infarction.

### **3. Wound Healing:**

### **4. Hypersensitivity:**

- Anaphylaxis • Type II Hypersensitivity • Type III Hypersensitivity
- Cell mediated Reaction and its clinical importance • Systemic Lupus Erythmatosis

### **5. Neoplasia:**

- Carcinogenesis & Carcinogens – Chemical, Viral and Microbial
- Grading and Staging of Cancer,
- Characteristics of benign and malignant tumors

### **6. Aids Management of Immune deficiency patients requiring surgical procedures**

7. Ghons complex, post primary pulmonary tuberculosis – pathology and pathogenesis
8. Circulatory disturbances – ischemia, hyperemia, edema, thrombosis, embolism, infarction, allergy and hypersensitivity reaction.
9. Developmental disturbances of Teeth,
10. Dental Caries, Regressive changes of teeth, pulp, periapical pathology, pulp reaction to dental caries and dental procedures.
11. Bacterial, viral, mycotic infections of the oral cavity.
12. Oral manifestations of Systemic diseases.

### **Microbiology:**

- General Bacteriology- Identification of bacteria, Culture media and culturing techniques
- Oral Microbial flora in health and disease
- Pathways of pulpal infection, oral flora and micro organisms associated with endodontic diseases, pathogenesis, host defence, bacterial virulence factors, healing, theory of focal infections,
- Microbes in relevance to dentistry – streptococci, staphylococci, lactobacilli, corne bacterium, actinomycetes, clostridium, neisseria, vibrio, bacteroids, fusobacteria, spirochetes, mycobacterium, virus and fungi.
- Cross infection, infection control, infection control procedure, sterilization and disinfection.
- Immunology – antigen antibody reaction, allergy, hypersensitivity and anaphylaxis, auto immunity, grafts, viral hepatitis, HIV infections and aids.
- Identification and isolation of microorganisms from infected root canals.
- Virology: Herpes, Hepatitis and HIV viruses
- Mycology: Candidiasis

### **Pharmacology:**

1. Definition of terminologies used
2. Dosage and routes of administration of drugs
3. Action and fate of drugs in the body
4. Drugs acting on the CNS

5. Drug reactions and Interactions

6. General and local anesthetics:

- Local anesthesia – Ideal properties, agents and chemistry, pharmacological actions, fate and metabolism of anesthetic, techniques and complications.
- General anesthesia – pre medications, neuro muscular blocking agents, induction agents, inhalation anesthesia, and agents used, assessment of anesthetic problems in medically compromised patients.
- Anesthetic emergencies

7. Antihistamines, corticosteroids,

8. hypnotics, antiepileptics, and & tranquilizers

9. Chemotherapeutics and antibiotics

10. Analgesics , anti-inflammatory and antipyretics drugs.

11. Antiseptics, sialogogues, and anti – sialogogues

12. Haematinics

13. Anti – diabetic therapy

14. Vitamins – A B Complex, C, D, E, K

14. Steroids

15. Hemostasis, and haemostatic agents, anticoagulants

16. Management of medically compromised patients including medical emergencies in the dental chair

17. Drug therapy of Emergencies; Seizures, Anaphylaxis, Shock and Diabetic ketoacidosis

### **Research Methodology and Biostatistics:**

- Essential features of a protocol for research in humans

- Experimental and non-experimental study designs
- Ethical considerations of research

### **Biostatistics:**

- Basic concepts, Sampling, Health information systems – collection, compilation, presentation of data.
- Elementary statistical methods – presentation of statistical data, Statistical averages – measures of central tendency, measures of dispersion, Normal distribution.
- Tests of significance – parametric and non – parametric tests (Fisher exact test, Sign test, Median test, Mann Whitney test, [Kruskal Wallis one way analysis](#), Friedmann two way analysis, Regression analysis), Correlation and regression

### **Applied Dental Materials:**

- Physical and mechanical properties of dental materials.
- Impression materials
- Restorative materials,
- Composite resins and recent advances in composite resins,
- Principles of adhesion, bonding agents and recent developments
- Tarnish and corrosion,
- Dental amalgam,
- Dental Casting alloys,
- Inlay wax, Die materials and Investment materials
- Casting procedures and casting defects,
- Dental cements for restoration and pulp protection (luting, liners, bases) cavity varnishes.
- Dental ceramics-recent advances,
- Finishing and polishing materials.

Biocompatibility of Dental Materials and Methods of testing biocompatibility of materials used.

- Soldering and Welding.
- Dental cements for restoration and pulp protection (luting, liners, bases) cavity varnishes.

- Dental ceramics-recent advances,
- Finishing and polishing materials.
- Biocompatibility of Dental Materials and Methods of testing biocompatibility of materials used.
- Soldering and Welding

## **CONSERVATIVE DENTISTRY AND ENDODONTICS**

### **Paper-I: Conservative Dentistry**

1. Introduction to Operative Dentistry
2. Examination, diagnosis and treatment plan
3. Occlusion as related to conservative dentistry, contact, contour, its significance. Separation of teeth, matrices, used in conservative dentistry.
4. Dental caries- epidemiology, recent concept of etiological factors, pathophysiology, histopathology, diagnosis, caries activity tests, and Caries Vaccine, prevention of dental caries and management – recent methods.
5. Biomaterials-Review of material Science and BioMechanics
6. Fundamental concepts of Enamel and Dentin adhesion
7. Fundamentals in Tooth preparation
8. Hand and rotary cutting instruments, development of rotary equipment, speed ranges, hazards.
9. Dental burs and other modalities of tooth reparation- recent developments (air brasions, lasers etc.)
10. Infection control procedures in conservative dentistry, isolation equipments etc.
11. Direct concepts in tooth preparation and Restorations with amalgam - restorative techniques, failures and management.
12. Direct concepts in tooth preparation and Restorations with composite, GIC - restorative techniques, failures and management
13. Biologic response of pulp to various restorative materials and operative procedures.
14. Direct and indirect composite restorations.
15. Indirect tooth colored restorations- ceramic, inlays and onlays, veneers, crowns, recent advances in fabrication
16. Gingival tissue management.
17. Impression procedures used for indirect restorations.
18. Cast metal restorations, indications, contraindications, tooth preparation for class II inlay, onlay, full crown restorations. Restorative techniques, direct and indirect methods of fabrication including materials used for fabrication like inlay wax, investment materials and casting.
19. Direct gold restorations.
20. Restoration of Badly broken tooth.
21. Recent advances in restorative materials.
22. Esthetics including smile design
23. Management of non-carious lesions.
24. Management of discolored tooth
25. Minimal intervention dentistry.
26. Hypersensitivity-theories, causes and management.
27. Lasers in Conservative Dentistry.

28. CAD-CAM in restorative dentistry.
29. Digital imaging and its applications in restorative dentistry.
30. Clinical Photography.
31. 3D Printing in Conservative Dentistry and Endodontics

### **Paper-II: Endodontics**

1. Anatomy and Morphology of tooth and their root canal systems
2. Structure and function of Pulp Dentin Complex
3. Microbial and Non Microbial etiology of Endodontic Diseases
4. Rationale of endodontics.
5. Dental innervations and pain of pulpal origin
6. Pulp and periapical pathology.
7. Pathobiology of periapex.
8. Pulp and periapical pathology.
9. Pathobiology of periapex.
10. Diagnostic procedures – Orofacial dental pain emergencies: endodontic diagnosis and management, recent advances used for diagnosis.
11. Imaging devices and techniques: Analog Radiology, Digital Radiology, MRI and Ultrasound, CBCT in endodontic practice.
12. Imaging Interpretation
13. Case selection and treatment planning.
14. Endodontic microbiology.
15. Infection control procedures used in Endodontics (aseptic techniques such as rubber dam, sterilization of instruments etc.)
16. Preparation for treatment
17. Management of pain , fear and anxiety in Endodontic patients
18. Vital Pulp therapies
19. Access cavity preparation – objectives and principles
20. Endodontic instruments and instrumentation – recent developments, detailed description of hand, rotary, sonic, ultra sonic etc.
21. Working length determination of root canal system with recent developments.
22. cleaning and shaping of root canal system and recent developments in techniques of canal preparation.
23. Root canal irrigants and latest developments
24. Intra canal medicaments and recent advancements
25. Obturation of root canal system - materials, techniques and recent advances.

26. Endodontic therapy in teeth with anatomical variations
27. Endodontic emergencies and management
28. Traumatic injuries and management – endodontic treatment for young permanent teeth.
29. Endoperio interrelationship and management.
30. Multidisciplinary approach to endodontic situations.
31. Procedural errors in endodontics and their management.
32. Endodontic failures and retreatment.
33. Management of medically complex patients
34. Pharmacology in Endodontics including Drug interactions and laboratory tests
35. Resorptions and its management.
36. Management of teeth of Immature apex
37. Rhinosinusitis and Endodontic disease
38. Non Odontogenic toothache and chronic head and neck pain
39. Endodontic and Microsurgeries, recent developments in technique and devices and wound healing
40. Magnification in endodontics(Dental Loupes and Microscopes) .
41. Single visit endodontics, current concepts and controversies.
42. Outcomes and achieving success in long term endodontic therapy
43. Contemporary restoration of Endodontically treated teeth
44. Lasers in Endodontics.
45. Endodontic therapy in Paediatric
46. Endodontic therapy in Geriatric patients
47. Interrelationships of Endodontics and Orthodontics in treatment planning
48. Tooth discolourations and its Management
49. Regenerative Endodontics
50. Recent Advancements in endodontics- Minimally Invasive Endodontics, Guided Endodontics etc..

## Scheme of Examination

### **Practical / Clinical Examination: 200 Marks**

The duration of Clinical and Viva Voce examination will be 2 days for a batch of four students. If the number of candidates exceeds 4, the programme can be extended to 3rd day.

#### **Day 1**

##### **Clinical Exercise I – Random case discussion – (2) - 10+10 Marks**

(Diagnosis, Treatment, Planning & Discussion)

Cast core preparation

- (i) Tooth Preparation - 20 marks
- (ii) Direct Wax Pattern - 10 marks
- (iii) Casting - 10 marks
- (iv) Cementation - 05 marks
- (v) Retraction & Elastomeric Impression - 05 marks

##### **Clinical Exercise II - 30 Marks**

<b>Inlay Exercise)</b> (i) Tooth preparation for Class II Inlay (Gold or Esthetic)	20 marks
(ii) Fabrication of Indirect Pattern	-10 marks

#### **Day 2**

##### **Clinical Exercise III - 100 Marks**

<b>(Molar Endodontics)</b> (i) Local Anaesthesia and Rubber Dam application	- 20 marks
(ii) Access Cavity	- 20 marks
(iii) Working length determination	- 20 marks
(iv) Canal Preparation	- 20 marks
(v) Master cone selection	- 20 marks

### **C. Viva Voce: 100 Marks**

#### ***i. Viva-Voce examination: 80 marks***

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

#### ***ii. Pedagogy Exercise: 20 marks***

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes



# **SYLLABUS OF PART – I**

## **SUBJECT - ORAL AND MAXILLOFACIAL SURGERY**

**Applied Basic Sciences:** Applied Anatomy, Physiology, Biochemistry, General and oral Pathology and Microbiology and Pharmacology

### **Applied Anatomy:**

- Surgical anatomy of the scalp, temple and face
- Anatomy of the triangles of neck and deep structures of the neck
- Cranial and facial bones and its surrounding soft tissues with its applied aspects in maxillofacial injuries.
- Muscles of head and neck
- Arterial supply, venous drainage and lymphatics of head and neck
- Congenital abnormalities of head and neck
- Surgical anatomy of the cranial nerves
- Anatomy of the tongue and its applied aspects
- Surgical anatomy of the temporal and infra-temporal regions
- Anatomy and its applied aspects of salivary glands, pharynx, thyroid and parathyroid gland, larynx, trachea oesophagus
- Tooth eruption, morphology, and occlusion
- Surgical anatomy of the nose.
- The structure and function of the brain including surgical anatomy of intra cranial venous sinuses.
- Autonomous nervous system of head and neck
- Functional anatomy of mastication, deglutition, speech, respiration and circulation
- Development of face, Paranasal sinuses and associated structures and their anomalies
- TMJ: surgical anatomy and function

### **Physiology:**

#### **Nervous System**

- Physiology of nerve conduction, pain pathway, sympathetic and parasympathetic nervous system, hypothalamus and mechanism of controlling body temperature

## **Blood**

- Composition
- Hemostasis, various blood dyscrasia and management of patients with the same
- Hemorrhage and its control
- Capillary and lymphatic circulation
- Blood grouping, transfusing procedures.

## **Digestive System**

- Saliva – composition and functions of saliva
- Mastication deglutition, digestion, assimilation
- Urine formation, normal and abnormal constituents

## **Respiration**

- Control of ventilation, anoxia, asphyxia, artificial respiration
- Hypoxia – types and management

## **Cardio Vascular System**

- Cardiac cycle
- Shock
- Heart sounds
- Blood pressure
- Hypertension:

## **Endocrinology**

- General endocrinal activity and disorder relating to thyroid gland,
- Parathyroid gland, adrenal gland, pituitary gland, pancreas and gonads:
- Metabolism of calcium

## **Nutrition**

- General principles of a balanced diet, effect of dietary deficiency, protein energy malnutrition, Kwashiorkor, Marasmus.
- Fluid and Electrolytic balance in maintaining hemostasis and significance in minor and major surgical procedures.

## **Biochemistry:**

General principles governing the various biological activities of the body, such as osmotic pressure, electrolytes, dissociation, oxidation, reduction etc

General composition, of the body

Intermediary metabolism

Carbohydrates, proteins

Carbohydrates, proteins, lipids, and their metabolism nucleoproteins, nucleic, acid and nucleotides and their metabolism

Enzymes, vitamins and minerals

Hormones

Body and other fluids

Metabolism of inorganic elements

Detoxification in the body

Antimetabolites

## **Pathology:**

### **Inflammation**

- Repair and regeneration, necrosis and gangrene
- Role of component system in acute inflammation,
- Role of arachidonic acid its metabolites in acute inflammation,
- Growth factors in acute inflammation
- Role of molecular events in cell growth and intercellular signaling cell surface receptors
- Role of NSAIDs in radiation injury and its manifestation:
- Cellular changes in radiation injury and its manifestation:

### **Hemostasis**

- Role of endothelium in thrombogenesis,
- Arterial and venous thrombi,
- Disseminated Intravascular coagulation

### **Shock:**

- Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock
- Circulatory disturbances, ischemia hyperemia , venous congestion, edema, infarction

### **Chromosomal Abnormalities:**

- Marfans Syndrome, Ehler's Danlos Syndrome, Fragile X-Syndrome

### **Hypersensitivity:**

- Anaphylaxis, type 2 hypersensitivity, type 3 hyper sensitivity and cell mediated reaction and its clinical importance, systemic lupus erythematosus.

- Infection and infective granulomas

### **Neoplasia:**

- Classification of tumors.
- Carcinogenesis and carcinogen – chemical, viral and microbial
- Grading and staging of cancers, tumor Angiogenesis, Paraneoplastic syndrome, spread of tumors
- Characteristics of benign and malignant tumors

### **Others:**

- Sex linked agammaglobulinemia.
- AIDS
- Management of immun deficiency patients, requiring surgical procedures
- De George Syndrome
- Ghons complex, post primary pulmonary tuberculosis – pathology and pathogenesis.

### **Oral Pathology:**

- Developmental disturbances of oral and Para oral structures
- Regressive changes of teeth
- Bacterial, viral and mycotic infection of oral cavity
- Dental caries, diseases of pulp and periapical tissues
- Physical and chemical injuries of the oral cavity
- Oral manifestations of metabolic and endocrinal disturbances
- Diseases of jawbones and TMJ
- Diseases of blood forming organs in relation to oral cavity
- Cysts of the oral cavity
- Salivary gland diseases
- Role of laboratory investigations in oral surgery

### **Microbiology:**

- Immunity
- Knowledge of organisms commonly associated with disease of oral cavity.
- Morphology cultural characteristics of strepto, staphylo, pneumo, gono, meningo, clostridium group of organism, spirochetes, organisms of TB, leprosy, diphtheria, actinomycosis and moniliiasis
- Hepatitis B and its prophylaxis
- Culture and sensitivity test

- Laboratory determinations
- Blood groups, blood matching, RBC and WBC count
- Bleeding and clotting time etc, smears and cultures,
- Urine analysis and cultures.

### **Applied Pharmacology and Therapeutics:**

- Definition of terminologies used
- Dosage and mode of administration of drugs.
- Action and fate of drugs in the body
- Drug addiction, tolerance and hypersensitivity reactions.
- Drugs acting on the CNS
- General and local anesthetics, hypnotics, analeptics, and tranquilizers.
- Chemo therapeutics and antibiotic drugs.
- Analgesics and antipyretics
- Antitubercular and antisyphilitic drugs.
- Antiseptics, Sialogogues and antisialogogues
- Haematinics
- Antidiabetics
- Vitamins A,B-complex C,D,E,K

## ORAL & MAXILLOFACIAL SURGERY

### OBJECTIVES:

The training program in Oral and Maxillofacial Surgery is structured to achieve the following five objectives-

- Knowledge
- Skills
- Attitude
- Communicative skills and ability
- Research
- 

#### Knowledge:

- To have acquired adequate knowledge and understanding of the etiology, pathophysiology and diagnosis, treatment planning of various common oral and Maxillofacial surgical problems both minor and major in nature
- To have understood the general surgical principles like pre and post surgical management, particularly evaluation, post surgical care, fluid and electrolyte management, blood transfusion and post surgical pain management.
- Understanding of basic sciences relevant to practice of oral and maxillofacial surgery
- Able to identify social, cultural, economic, genetic and environmental factors and their relevance to disease process management in the oral and Maxillofacial region.
- Essential knowledge of personal hygiene and infection control, prevention of cross infection and safe disposal of hospital waste keeping in view the high prevalence of hepatitis and HIV.

#### Skills:

- To obtain proper clinical history, methodical examination of the patient, perform essential diagnostic procedures and order relevant laboratory tests and interpret them and to arrive at a reasonable diagnosis about the surgical condition.
- To perform with competence minor oral surgical procedures and common maxillofacial surgery. To treat both surgically and medically the problems of the oral and Maxillofacial and the related area.
- Capable of providing care for maxillofacial surgery patients.

#### Attitude:

- Develop attitude to adopt ethical principles in all aspect of surgical practice, professional honesty and integrity are to be fostered. Surgical care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Willing to share the knowledge and clinical experience with professional colleagues.
- Willing to adopt new techniques of surgical management developed from time to time based on scientific research which are in the best interest of the patient
- Respect patient right and privileges, including patients right to information and right to seek a second opinion.

- Develop attitude to seek opinion from an allied medical and dental specialists as and when required.

### **Communication Skills:**

- Develop adequate communication skills particularly with the patients giving them the various options available to manage a particular surgical problem and obtain a true informed consent from them for the most appropriate treatment available at that point of time
- Develop the ability to communicate with professional colleagues.
- Develop ability to teach undergraduates.

### **COURSE CONTENT:**

The speciality of Oral & Maxillofacial Surgery deals with the diagnosis and management of the diseases of stomatognathic system, jaw bones, cranio-maxillofacial region, salivary glands and temporomandibular joints etc. Within this framework it also supports many vital organs like eye, oropharynx, nasopharynx and major blood vessels and nerves. The traumatic injuries of maxillofacial skeleton are independently managed by Oral & Maxillofacial Surgeons. Whenever there are orbital injuries the ophthalmologists are trained only to tackle injuries of the eye ball (globe) but if there are associated injuries of the orbital skeleton, the Maxillofacial Surgeon is involved in its re-construction. Similarly, nasal bone fracture may be managed by ENT surgeons. Most of the time nasal bone fractures are associated with fractures of the maxilla, mandible and zygomatic bones which are being managed by Oral & Maxillofacial Surgeons. The maxillofacial facial injuries at times are associated with head injuries also. The Oral & maxillofacial Surgeon is involved in the management of cleft lip & cleft palate, orthognathic surgery, micro vascular surgery, reconstructive and oncological surgical procedures of maxillofacial region. The speciality of Oral & Maxillofacial Surgery is a multi disciplinary speciality and needs close working in co-ordination with Neurosurgeons, Oncosurgeons, Ophthalmologists, ENT Surgeons and Plastic Surgeons. The Oral & Maxillofacial Surgeons, Ophthalmologist, ENT Surgeons, Plastic Surgeons, Neuro-Surgeons and Oncologists complement each other by performing Surgical Procedures with their respective expertise and knowledge thereby benefiting the patients and students of the respective specialities.

The program outline addresses both the knowledge needed in Oral and Maxillofacial Surgery and allied medical specialties in its scope. A minimum of three years of formal training through a graded system of education as specified will equip the trainee with skill and knowledge at its completion to be able to practice basic oral and Maxillofacial surgery competently and have the ability to intelligently pursue further apprenticeship towards advanced Maxillofacial surgery.

The topics are considered as under:-

- A) Applied Basic sciences
- B) Oral and Maxillofacial surgery
- C) Allied specialties

### **A) Applied Basic Sciences:**

Applied Anatomy, Physiology, Biochemistry, General and Oral Pathology and Microbiology, Pharmacology and Knowledge in Basic Statistics.

### **Applied Anatomy:**

1. Surgical anatomy of the scalp, temple and face
2. Anatomy of the triangles of neck and deep structures of the neck
3. Cranial and facial bones and its surrounding soft tissues with its applied aspects in maxillofacial injuries.
4. Muscles of head and neck; chest , lower and upper extremities (in consideration to grafts/flaps)
5. Arterial supply, venous drainage and lymphatics of head and neck
6. Congenital abnormalities of the head and neck
7. Surgical anatomy of the cranial nerves
8. Anatomy of the tongue and its applied aspects
9. Surgical anatomy of the temporal and infratemporal regions
10. Anatomy and its applied aspects of salivary glands, pharynx, thyroid and parathyroid gland, larynx, trachea, esophagus
11. Tooth eruption, morphology, and occlusion.
12. Surgical anatomy of the nose.
13. The structure and function of the brain including surgical anatomy of intra cranial venous sinuses.
14. Autonomous nervous system of head and neck
15. Functional anatomy of mastication, deglutition, speech, respiration and circulation
16. Development of face, paranasal sinuses and associated structures and their anomalies
17. TMJ: surgical anatomy and function

### **Physiology:**

#### **1. Nervous system**

- Physiology of nerve conduction, pain pathway, sympathetic and parasympathetic nervous system, hypothalamus and mechanism of controlling body temperature

#### **2. Blood**

- Composition
- Haemostasis, various blood dyscrasias and management of patients with the same
- Hemorrhage and its control
- Capillary and lymphatic circulation.
- Blood grouping, transfusing procedures.

#### **3. Digestive system**

- Saliva - composition and functions of saliva
- Mastication, deglutition, digestion, assimilation
- Urine formation, normal and abnormal constituents

#### **4. Respiration**

- Control of ventilation, anoxia, asphyxia, artificial respiration
- Hypoxia – types and management

#### **5. CardioVascular System**

- Cardiac cycle,
- Shock
- Heart sounds,
- Blood pressure,
- Hypertension:

#### **6. Endocrinology**

- General endocrinal activity and disorder relating to thyroid gland,
- Parathyroid gland, adrenal gland, pituitary gland, pancreas and gonads:

- Metabolism of calcium

## 7. Nutrition

- General principles of a balanced diet, effect of dietary deficiency, protein energy malnutrition, Kwashiorkor, Marasmus.
- Fluid and Electrolytic balance in maintaining haemostasis and significance in minor and major surgical procedures.

### **Biochemistry:**

- General principles governing the various biological activities of the body, such as osmotic pressure, electrolytes, dissociation, oxidation, reduction etc.
- General composition of the body
- Intermediary metabolism
- Carbohydrates, proteins, lipids, and their metabolism
- Nucleoproteins, nucleic acid and nucleotides and their metabolism
- Enzymes, vitamins and minerals
- Hormones
- Body and other fluids.
- Metabolism of inorganic elements.
- Detoxification in the body.
- Antimetabolites.

### **Pathology:**

#### 1. Inflammation –

- Repair and regeneration, necrosis and gangrene
- Role of component system in acute inflammation,
- Role of arachidonic acid and its metabolites in acute inflammation,
- Growth factors in acute inflammation
- Role of molecular events in cell growth and intercellular signaling cell surface receptors
- Role of NSAIDs in inflammation,
- Cellular changes in radiation injury and its manifestation:

#### 2. Haemostasis

- Role of endothelium in thrombogenesis,
- Arterial and venous thrombi,
- Disseminated Intravascular coagulation

#### 3. Shock:

- Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock
- Circulatory disturbances, ischemia, hyperemia, venous congestion, edema, infarction

#### 4. Chromosomal abnormalities:

- Marfans Syndrome, Ehler's Danlos Syndrome, Fragile X-Syndrome

#### 5. Hypersensitivity:

- Anaphylaxis, type 2 hypersensitivity, type 3 hyper sensitivity and cell mediated reaction and its clinical importance, systemic lupus erythematosus.

- Infection and infective granulomas.
- 6. Neoplasia:**
- Classification of tumors.
  - Carcinogenesis and carcinogens- chemical, viral and microbial
  - Grading and staging of cancers, tumor Angiogenesis, Paraneoplastic syndrome, spread of tumors
  - Characteristics of benign and malignant tumors
- 7. Others:**
- Sex linked agammaglobulinemia.
  - AIDS
  - Management of immuno deficiency patients requiring surgical procedures
  - De George Syndrome
  - Ghons complex, post primary pulmonary tuberculosis – pathology and pathogenesis.

**Oral Pathology:**

- Developmental disturbances of oral and Para oral structures
- Regressive changes of teeth.
- Bacterial, viral and mycotic infections of oral cavity
- Dental caries,, diseases of pulp and periapical tissues
- Physical and chemical injuries of the oral cavity
- Oral manifestations of metabolic and endocrinal disturbances
- Diseases of jawbones and TMJ
- Diseases of blood and blood forming organs in relation to oral cavity
- Cysts of the oral cavity
- Salivary gland diseases
- Role of laboratory investigations in oral surgery

**Microbiology:**

- Immunity
- Knowledge of organisms commonly associated with diseases of oral cavity.
- Morphology cultural characteristics of strepto, staphylo, pneumo, gono, meningo, clostridium group of organisms, spirochetes, organisms of TB, leprosy, diphtheria, actinomycosis and moniliasis
- Hepatitis B and its prophylaxis
- Culture and sensitivity test
- Laboratory determinations
- Blood groups, blood matching, RBC and WBC count
- Bleeding and clotting time etc, smears and cultures,
- Urine analysis and cultures.

**Applied Pharmacology and Therapeutics:**

1. Definition of terminologies used
2. Dosage and mode of administration of drugs.
3. Action and fate of drugs in the body
4. Drug addiction, tolerance and hypersensitivity reactions.
5. Drugs acting on the CNS
6. General and local anesthetics, hypnotics, analeptics, and tranquilizers.

7. Chemo therapeutics and antibiotics
8. Analgesics and antipyretics
9. Antitubercular and antisyphilitic drugs.
10. Antiseptics, sialogogues and antisialogogues
11. Haematinics
12. Antidiabetics
13. Vitamins A, B-complex, C, D, E, K

## **B) Oral and Maxillofacial Surgery:**

- Evolution of Maxillofacial surgery.
- Diagnosis, history taking, clinical examination, investigations.
- Informed consent/medico-legal issues.
- Concept of essential drugs and rational use of drugs.
- Communication skills with patients- understanding, clarity in communication, compassionate explanations and giving emotional support at the time of suffering and bereavement
- Principles of surgical audit – understanding the audit of process and outcome. Methods adopted for the same. Basic statistics.
- Principles of evidence based surgery- understanding journal based literature study; the value of textbook, reference book articles, value of review articles; original articles and their critical assessment, understanding the value of retrospective, prospective, randomized control and blinded studies, understanding the principles and the meaning of various Bio-statistical tests applied in these studies.
- Principles of surgery- developing a surgical diagnosis, basic necessities for surgery, aseptic technique, incisions, flap designs, tissue handling, hemostasis, dead space management, decontamination and debridement, suturing, edema control, patient general health and nutrition.
- Medical emergencies – Prevention and management of altered consciousness, hyper sensitivity reaction, chest discomfort, respiratory difficulty.
- Pre operative workup – Concept of fitness for surgery; basic medical work up; work up in special situation like diabetes, renal failure, cardiac and respiratory illness; risk stratification
- Surgical sutures, drains
- Post operative care- concept of recovery room care, Airway management, Assessment of Wakefulness, management of cardio vascular instability in this period, Criteria for shifting to the ward, pain management
- Wound management- Wound healing, factors influencing healing, basic surgical techniques, Properties of suture materials, appropriate use of sutures.
- Surgical Infections – Asepsis and antisepsis, Microbiological principles, Rational use of antibiotics, special infections like Synergistic Gangrene and Diabetic foot infection, Hepatitis and HIV infection and cross infection.
- Airway obstruction/management – Anatomy of the airway, principles of keeping the airway patent, mouth to mouth resuscitation, Oropharyngeal airway, endotracheal intubation, Cricothyroidectomy, Tracheostomy.
- Anesthesia – stages of Anesthesia, pharmacology of inhalation, intravenous and regional anesthetics, muscle relaxants.
- Facial pain; Facial palsy and nerve injuries.
- Pain control – acute and chronic pain, cancer and non-cancer pain,

- patient controlled analgesia
- General patient management – competence in physical assessment of patients of surgery, competence in evaluation of patients presenting with acute injury, particularly to maxillofacial region. Competence in the evaluation of management of patients for Anesthesia
- Clinical oral surgery – all aspects of dento alveolar surgery
- Pre-prosthetic surgery – A wide range of surgical reconstructive procedures involving their hard and soft tissues of the edentulous jaws.
- Temporomandibular joint disorders – TMJ disorders and their sequelae need expert evaluation, assessment and management. It is preferable to be familiar with diagnostic and therapeutic arthroscopic surgery procedures.
- Tissue grafting – Understanding of the biological mechanisms involved in autogenous and heterogeneous tissue grafting.
- Reconstructive oral and maxillofacial surgery – hard tissue and soft tissue reconstruction.
- Cyst and tumors of head and neck region and their management – including principles of tumor surgery, giant cell lesion of jaw bones, fibro osseous lesions of jaw.
- Neurological disorders of maxillofacial region-diagnosis and management of Trigeminal Neuralgia, MPDS, Bells palsy, Frey's Syndrome, Nerve injuries
- Maxillofacial trauma – basic principles of treatment, primary care, diagnosis and management of hard and soft tissue injuries, Comprehensive management including polytrauma patients
- Assessment of trauma-multiple injuries patient, closed abdominal and chest injuries, penetrating injuries, pelvic fractures, urological injuries, vascular injuries.
- Orthognathic surgery – The trainee must be familiar with the assessment and correcting of jaw deformities
- Laser surgery – The application of laser technology in the surgical treatment of lesions amenable to such therapy
- Distraction osteogenesis in maxillofacial region.
- Cryosurgeries – Principles, the application of cryosurgery in the surgical management of lesions amenable to such surgeries.
- Cleft lip and palate surgery- detailed knowledge of the development of the face, head and neck, diagnosis and treatment planning, Current concepts in the management of cleft lip and palate deformity, knowledge of nasal endoscopy and other diagnostic techniques in the evaluation of speech and hearing, concept of multi disciplinary team management.
- Aesthetic facial surgery – detailed knowledge of structures of face & neck including skin and underlying soft tissues, diagnosis and treatment planning of deformities and conditions affecting facial skin, underlying facial muscles, bone, eyelids, external ear etc., surgical management of post acne scarring, face lift, blepharoplasty, otoplasty, facial bone recountouring etc.
- Craniofacial surgery – basic knowledge of developmental anomalies of face, head and neck, basics concept in the diagnosis and planning of various head and neck anomalies including facial cleft, craniosynostosis, syndromes, etc., Current concepts in the management of craniofacial anomalies.
- Head and neck oncology – understanding of the principles of management of head and neck oncology including various pre

cancerous lesions, Experience in the surgical techniques of reconstruction following ablative surgery.

- Micro vascular surgery.
- Implantology – principles, surgical procedures for insertion of various types of implants.
- Maxillofacial radiology/ radio diagnosis
- Other diagnostic methods and imaging techniques

### **C) Allied Specialties:**

- General medicine: General assessment of the patient including children with special emphasis on cardiovascular diseases, endocrinal, metabolic respiratory and renal diseases, Blood dyscrasias
- General surgery: Principles of general surgery, exposure to common general surgical procedures.
- Neuro – surgery: Evaluation of a patient with head injury, knowledge & exposure of various Neuro – surgical procedures
- ENT/Ophthalmology: Examination of ear, nose, throat, exposure to ENT surgical procedures, ophthalmic examination and evaluation, exposure to ophthalmic surgical procedures.
- Orthopedic: basic principles of orthopedic surgery, bone diseases and trauma as relevant to Maxillofacial surgery, interpretation of radiographs, CT, MRI and ultrasound
- Anesthesiology: Evaluation of patients for GA technique, general anesthetic drugs use and complications, management of emergencies, various IV sedation techniques.
- Plastic Surgery- Basic Principles

### **TEACHING / LEARNING ACTIVITIES:**

**The post graduate is expected to complete the following at the end of :**

#### **I Year**

Study of applied basic sciences including practicals (wherever necessary), basic computer sciences, exodontia, seminars on basic topics, selection of dissertation topic, library assignment topic, attending O.T, ward rounds, Medical Record keeping, Pre-clinical exercises, preparation of synopsis and its submission within the six months after admission to the university as per calendar of events.

#### **Rotation and postings in other departments:**

General medicine	- 1 month
General surgery	- 1 month
Ophthalmology	- 15 days
Neuro Surgery	- 15 days
ENT	- 15 days
Orthopedic	- 15 days
Plastic Surgery	- 15 days
Casualty	- 15 days
Anesthesia (ICU)	- 15 days
Radiology (CT, MRI, USG)	- 15 days

#### **II Year**

- Minor oral surgery and higher surgical training
- Submission of library assignment
- Oncologyposting – 1 month

### **III Year**

- Maxillofacial surgery
- Submission of dissertation to the university, six months before the final examination.

It is desirable to enter general surgical skills and operative procedures that are observed, assisted or performed in the log book in the format as given below:-

<b>SI.No</b>	<b>Procedure</b>	<b>Category</b>	<b>Number</b>
1	Injection I.M. and I.V.	PI	50, 20
2	Minor suturing and removal of sutures	PI	N,A
3	Incision & drainage of an abscess	PI	10
4	Surgical extraction	PI	15
5	Impacted teeth	PI, A	30,20
6	Pre prosthetic surgery- corrective procedures ridge extension ridge reconstruction	PI A A	10 3 3
7	OAF closure	PI, A	3,2
8	Cyst enucleation	PI,A	5,5
9	Mandibular fractures	PI,A	10,10
10	Peri-apical surgery	PI,A	5
11	Infection management	PI,A	3,3
12	Biopsy procedures	PI, A	10, 3
13	Removal of salivary calculi	A	3
14	Benign tumors	A	3,3
15	mid face fractures	PI,A	3,5
16	Implants	PI,A	5,5
17	Tracheotomy	A	2
18	Skin grafts	PI,A	2,2
19	Orthognathic surgery	A,O	3,5
20	Harvesting bone & cartilage grafts Iliac crest Rib Calvarial Fibula	A,O A,O A,O A,O	3,5 3,3 2,2 2,2
21	T.M. Joint surgery	A	3
22	Jaw resections	A,O	3,5
23	Onco surgery	A,O	3,3
24	Micro vascular anastomosis	A,O	2,2
25	Cleft lip & palate	A,O	3,5
26	Distraction osteogenesis	A,O	2,3
27	Rhinoplasty	A,O	2,3
28	Access osteotomies and base of skull surgeries	A,O	1,3

29	Emergency Management for OMFS Patients in Casualty / Accident & Emergency	PI,O	5,5
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PI:- Performed

Independently

A:- Assisted

O:- Observed

### **Monitoring Learning Progress:**

It is essential to monitor the learning progress to each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV.

### **Paper wise distribution of syllabus:**

#### **PART- I:**

**Applied Basic Sciences**

#### **PART-II:**

**Paper– I:Minor Oral Surgery and**

**Maxillofacial Trauma Minor Oral**

#### **Surgery:**

- **Principles of Surgery:** Developing A Surgical Diagnosis, Basic Necessities For Surgery, Aseptic Technique, Incisions, Flap Design Tissue Handling, Haemostasis, Dead Space Management, Decontamination And Debridement, Suturing, Oedema Control, Patient General Health And Nutrition.
- **Medical Emergencies:** Prevention and management of altered consciousness (syncope, orthostatic hypotension, seizures, diabetes mellitus, adrenal insufficiency), hypersensitivity reactions, chest discomfort, and respiratory difficulty.
- **Examination and Diagnosis:** Clinical history, physical and radiographic, clinical and laboratory diagnosis, oral manifestations of systemic diseases, implications of systemic diseases in surgical patients.
- **Haemorrhage and Shock:** Applied physiology, clinical abnormalities of coagulation, extra vascular hemorrhage, and hemorrhagic lesions, management of secondary hemorrhage, shock.
- **Exodontia:** Principles of extraction, indications and contraindications, types of extraction, complications and their management, principles of elevators and elevators used in oral surgery.
- **Impaction:** Surgical anatomy, classification, indications and contraindications, diagnosis, procedures, complications and their management.
- **Surgical aids to eruption of teeth:** Surgical exposure of unerupted teeth, surgical repositioning of partially erupted teeth.

- **Transplantation of the teeth**
- **Surgical Endodontics:** Indications and contraindications, diagnosis, procedures of periradicular surgery, Resection of the roots in periapical procedures, Retrograde fillings
- **Preprosthetic Surgery:** Requirements, types (alveoplasty, tuberosity reduction, mylohyoid ridge reduction, genial reduction, removal of exostosis, vestibuloplasty) Advanced preprosthetic surgical procedures,
- **Procedures to Improve Alveolar Soft Tissues:** Hypermobility tissues- operative / sclerosing method, epulis fissuratum, frenectomy and frenotomy
- **Infections of Head and Neck:** Odontogenic and non Odontogenic infections, factors affecting spread of infection, diagnosis and differential diagnosis, management of facial space infections, Ludwig angina, cavernous sinus thrombosis.
- **Chronic infections of the jaws:** Osteomyelitis (types, etiology, pathogenesis, management) osteoradionecrosis, Medication related osteonecrosis of jaws, Fungal infections involving jaws
- **Maxillary Sinus:** Maxillary sinusitis – types, pathology, treatment, closure of Oro  
– antral fistula, Caldwell- luc operation
- **Cysts of the Orofacial Region:** Classification, diagnosis, management of OKC, dentigerous, radicular, non Odontogenic, ranula
- **Neurological disorders of the Maxillofacial Region:** Diagnosis and management of trigeminal neuralgia, MPDS, bell's palsy, Frey's syndrome, nerve injuries. Classification of nerve injuries, Management protocol in nerve injury, Physiology of nerve regeneration
- **Implantology:** Definition, classification, indications and contraindications, advantages and disadvantages, surgical procedure. Principles of Basic Implantology, Maxillary sinus lift procedures, Concept of tilted implants Zygomatic implants, Cad cam planning in oral Implantology, Bone augmentation procedures Maxillofacial implants for rehabilitation of facial deformities and defects
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- **Anesthesia**  
Local Anesthesia:  
Classification of local anesthetic drugs, mode of action, indications and contra indications, advantages and disadvantages, techniques, complications and their management Advances in local anaesthesia Computer assisted drug delivery system  
Preoperative evaluation and investigations in maxillofacial surgery  
Medical emergencies in maxillofacial surgical practice.  
  
General Anesthesia:  
Classification, stages of GA, mechanism of action, indications, and contra indications, advantages and disadvantages, post anesthetic complications and emergencies, anesthetic for dental procedures in children, pre medication, conscious sedation, legal aspects for GA  
Perioperative and postoperative monitoring for maxillofacial surgery patient  
Operating room protocols  
Drugs for General anaesthesia

### **Maxillofacial Trauma:**

- Surgical Anatomy of Head and Neck.
- Etiology of Injury.
- Basic Principles of Treatment
- Primary Care: resuscitation, establishment of airway, management of hemorrhage, management of head injuries and admission to hospital.
- Diagnosis: clinical, radiological
- Soft Tissue Injury of Face and Scalp: classification and management of soft tissue wounds, injuries to structure requiring special treatment.
- Dento Alveolar Fractures: examination and diagnosis, classification, treatment, prevention.
- Mandibular Fractures: classification, examination and diagnosis, general principles of treatment, complications and their management
- Fracture of Zygomatic Complex: classification, examination and diagnosis, general principles of treatment, complications and their management.
- Orbital Fractures: blow out fractures
- Nasal Fractures
- Fractures of Middle Third of the Facial Skeleton: emergency care, fracture of maxilla, and treatment of Le Fort I, II, III, fractures of Naso orbito- ethmoidal region.
- Ophthalmic Injuries: minor injuries, non-perforating injuries, perforating injuries, retro bulbar hemorrhage, and traumatic optic neuropathy.
- Traumatic Injuries To Frontal Sinus: diagnosis, classification, treatment
- Maxillofacial Injuries in Geriatric and Pediatric Patients.
- Gun Shot Wounds and War Injuries
- Osseointegration in Maxillofacial Reconstruction
- Metabolic Response to Trauma: neuro endocrine responses, inflammatory mediators, clinical implications
- Healing of Traumatic Injuries: soft tissues, bone, cartilage, response of peripheral nerve to injury
- Nutritional consideration following Trauma.
- Tracheostomy indications and contraindications, procedure, complications and their management
- Residual deformities of maxillofacial region.

## **Paper – II : Maxillofacial Surgery**

### **a) Salivary gland**

- Sialography
- Salivary fistula and management
- Diseases of salivary gland – developmental disturbances, cysts, inflammation and sialolithiasis
- Mucocele and Ranula
- Tumors of salivary gland and their management
- Staging and Imaging of salivary gland tumors
- Parotidectomy

### **b) Temporomandibular Joint**

- Etiology, history signs, symptoms, examination and diagnosis of temporomandibular joint

disorders

- Various anomalies of condyle
- Hemifacial microsomia and condylar elongation
- Ankylosis and management of the same with different treatment modalities
- MPDS and management
- Condylectomy – different procedures
- Various approaches to TMJ
- Recurrent dislocations – Etiology and Management
- Role of Arthrocentesis & Arthroscopy in TMD

**c) Oncology**

- Biopsy Types of biopsy Immunohistochemistry, Sentinel Node and its significance
- Management of pre-malignant tumors of head and neck region
- Benign and Malignant tumors of Head and Neck region
- Staging of oral cancer and tumor markers
- Management of oral cancer
- Radical Neck dissection
- Modes of spread of tumors
- Diagnosis and management of tumors of nasal, paranasal, neck, tongue, cheek, maxilla and mandible
- Radiation therapy in maxillofacial regions
- Chemotherapy for squamous cell carcinoma
- Sarcomas of head neck face region
- Lateral neck swellings
- Hard & Soft tissue flaps in reconstruction
- Recent diagnostic aids in oral malignancy
- Rehabilitation & Quality of life of pts with oral oncology
- Access surgeries & Osteotomies for maxillofacial region

**d) Orthognathic surgery**

- Diagnosis and treatment planning
- Cephalometric analysis
- Model surgery and preparation of splints
- Maxillary and mandibular repositioning procedures
- Segmental osteotomies
- Management of apertognathia
- Genioplasty
- Distraction osteogenesis
- Surgery first approach in orthognathic surgery
- Management of patients with facial asymmetry
- Protocol of Management of Obstructive Sleep apnea

**e) Cysts and tumors of oro facial region**

- Odontogenic and non-Odontogenic tumors and their management
- Giant Cell lesions of jawbone
- Fibro osseous lesions of jawbone
- Cysts of jaw
- Reactive lesions of the maxillofacial region
- Vascular anomalies of maxillofacial region ,Digital subtraction

angiography

- Embolization for maxillofacial pathology
- Recent advance in the management of the jaw pathology

**f) Laser surgery**

- Principles of laser, Types of lasers, Advantages & Disadvantages
- The application of laser technology in surgical treatment of lesions

**g) Cryosurgery & Piezosurgery**

- Principles, applications of cryosurgery in surgical management
- Principles ,application of piezosurgery in maxillofacial region

**h) Cleft lip and palate surgery**

- Detailed knowledge of the development of the face, head and neck
- Diagnosis and treatment planning
- Current concepts in the management of cleft lip and palate deformity
- Knowledge of Nasoendoscopy and other diagnostic techniques in the evaluation of speech and hearing
- Concept of multidisciplinary team management
- Cleft hypoplastic maxilla
- Cleft rhinoplasty
- Role of speech therapy
- Alveolar bone grafting
- Rare Facial clefts

**i) Aesthetic facial surgery**

- Detailed knowledge of the structures of the face and neck including skin and underlying soft tissue
- Diagnosis and treatment planning of deformities and conditions affecting facial skin
- Underlying facial muscles, bone, Eyelids, external ear
- Surgical management of post acne scarring, facelift, blepharoplasty, otoplasty, facial bone recontouring, etc
- Non surgical modalities of facial rejuvenation
- Role of fillers in facial aesthetics
- Ear Reconstruction
- Surgery for follicle of hair
- Aesthetic rhinoplasty

**j) Advances in Maxillofacial**

Tissue engineering in maxillofacial surgery  
Stem cell research and regeneration  
Computer assisted maxillofacial surgery  
Robotics in maxillofacial region  
Recent advances in imaging in maxillofacial region

**K) Craniofacial surgery**

- Basic knowledge of developmental anomalies of the face, head and neck
- Basic concepts in the diagnosis and planning of various head and neck anomalies including facial clefts, craniosynostosis, syndromes, etc.
- Current concept in the management of Craniofacial anomalies
- Modern management of Craniosynostosis
- Syndromes & Sequence of craniofacial region

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**Paper – III : Essays (descriptive and analyzing type questions)**

<b><u>Scheme of Examination</u></b>		
<b><u>A. Theory</u></b>		
Part – I	Basic sciences paper	100 Marks
Part – II	Paper –I Paper-II & paper-III	300 Marks (100 Marks for each paper)
<p>Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II &amp; Paper-III, each of three hours duration. Paper-I &amp; Paper-II shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Paper-III will be on Essays. In Paper-III three Questions will be given and student has to answer any two questions. Each question carries 50 marks. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: *</p>		
<b><u>PART-I</u></b> : Applied Basic Sciences: Applied Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.		
<b><u>PART- II</u></b>		
<p><b>Paper – I</b> : Minor Oral Surgery and Maxillofacial Trauma  <b>Paper – II</b> : Maxillofacial Surgery  <b>Paper – III</b> : Essays (descriptive and analyzing type questions)</p>		
<p><i>*The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.</i></p>		
<b>A. Practical / Clinical Examination</b>	-	<b>200 Marks</b>
<b>1. Minor Oral Surgery</b>	-	100 Marks
<p>Each candidate is required to perform the minor oral surgical procedures under local anaesthesia. The minor surgical cases may include removal of impacted lower third molar, cyst enucleation, any similar procedure where students can exhibit their professional skills in raising the flap, removing the bone and suturing the wound.</p> <p>Break up the marks is desirable as per the decision of all four examiners for equal opportunity in every steps to score the marks to the candidates</p>		
<b>2. Case presentation and discussion:</b>		100 Marks
(a) One long case	-	60 Marks
(b) Two short cases	-	40 Marks (20 marks each)
<b>B. Viva Voce</b>	-	<b>100 Marks</b>
<b>i. Viva-Voce examination:</b>		80
<b>Marks</b>		
<p>All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.</p>		

Minimum time of viva for each candidate should not be less than 45 to 60 minutes.

***ii. Pedagogy:***

*20 Marks*

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes. Topic of pedagogy should be other than the dissertation topic of candidate.

# **SYLLABUS OF PART – I**

## **SUBJECT: ORAL MEDICINE AND RADIOLOGY**

### **Applied Anatomy**

#### **1. Gross Anatomy of the face**

- Muscles of Mastication
- Facial nerve/artery/vein
- Parotid Gland and its relations
- Tongue
- TMJ and Infra Temporal fossa
- Vestibule and oral cavity
- Palate- Soft and hard

#### **2. Neck Region**

- Facial Spaces
- Lymphatic system

#### **3. Cranial Nerve- V, VII, IX, XI, XII**

#### **4. Nasal Cavity**

- Nasal Septum
- Lateral Wall
- Paranasal sinuses

#### **5. Jaw Bones (Maxilla and Mandible)**

- Development
- Anatomy
- Ossification
- Age Changes

#### **6. Embryology**

a. Development of;

- face
- tongue
- Palate
- Salivary glands

- Maxillary Sinus

b. Congenital anomalies

**7. Tooth**

- Development
- Anatomy
- Age changes

**8. Histology**

- Epithelium of Oral cavity and respiratory tract
- Connective tissue
- Muscular tissue
- Nervous tissue
- Blood vessels
- Cartilage
- Bone
- Tooth
- Tongue
- Salivary Gland
- Tonsil
- Lymph nodes

**Physiology and Biochemistry**

**A. Physiology**

**1. General Physiology**

- Cell
- Cellular transport

**2. Muscle nerve Physiology**

- Structure of neuron and properties of nerve fibres
- Structure of muscle fibres and properties of muscle fibres
- Neuromuscular transmission
- Mechanism of muscle contraction

**3. Blood**

- RBC and HB
- WBC- structure and functions
- Platelets- functions and applied aspects
- Plasma proteins
- Blood coagulation with applied aspects

- Blood Groups
- Lymph and applied aspects

#### **4. Respiratory System**

- Respiratory rate
- Hypoxia; effects of increased and decreased barometric pressure

#### **5. Cardio-Vascular System**

- Regulation of blood pressure
- Shock, hypertension, cardiac failure

#### **6. Excretory System**

- Renal Function tests

#### **7. Gastro-Intestinal Tract**

- a. Composition, function and regulation of;
  - Saliva
  - Gastric juice
- b. Mastication and deglutition

#### **8. Endocrine System**

- a. Hormones- classification and mechanism of action and applied aspects

#### **9. Central Nervous System**

- a. Ascending tracts with special reference to pain pathway

#### **10. Special Senses**

- a. Gustation and Olfaction

#### **B. Biochemistry**

- **Metabolism of;**
  - a. Carbohydrates
  - b. Lipids
  - c. Proteins
  - d. Minerals
- **Energy Metabolism**
  - a. Basic Metabolic Rate

- **Vitamins**

a. Classification, source, metabolism and deficiencies

## **Pathology**

- **Inflammation (Acute/Chronic)**

- Repair and regeneration, necrosis and gangrene
- Role of complement system in inflammation
- Role of arachidonic acid and its metabolites in inflammation
- Role of NSAIDS in inflammation
- Cellular changes in radiation injury and its manifestations

- **Homeostasis**

- Role of endothelium in thrombo-genesis
- Arterial and venous thrombi
- Disseminated intra vascular coagulation
- AV malformation

- **Shock**

a. Pathogenies and clinical presentation of;

- Hemorrhagic shock
- Neurogenic shock
- Septic shock
- Cardiogenic shock
- Circulatory shock

b. Edema

c. Infarction

- **Hypersensitivity**

a. Anaphylaxis

b. Type II Hypersensitivity

c. Type III Hypersensitivity

d. Cell mediated reaction and its clinical importance (e.g. SLE/Infection/Infective granulomas)

- **Neoplasia**

a. Classification of tumours

b. Carcinogenesis and carcinogens; Chemical, Viral, Microbial

- c. Grading and staging of cancers
- d. Spread of tumours
- e. Characteristics of benign and malignant tumours

### **Applied Immunology**

- Antigen
- Antibody
- Heptane's
- Complement
- Types of reaction
- Cellular Vs humoral
- Complication
- Management of Immune deficiency patients

### **Applied Common Investigations**

- CBC
- Coagulation Profile
- Biochemical
- KFT
- LFT

### **Microbiology**

#### **Oral Microbial Flora**

- Commensal flora
- Conditions causing alterations in flora

#### **Sterilization and Asepsis**

- Aseptic care
- Physical and chemical methods of sterilization
- Antiseptics
- Handling of sterile material

### **Pharmacology**

1. Definition and terminology
2. Mechanism, action and dosage of;
  - Antibiotics

- Analgesics
  - Steroids
  - Anti-histaminic
  - Anti-coagulants
  - Sedatives and tranquilizers
  - Hematinics
  - Desensitizers
  - Sialagogues and anti-sialagogues
3. Drug tolerance, interaction and hypersensitivity reaction

## **Research Methodology and Biostatistics**

### **Research Methodology**

1. Introduction and purpose of research
2. Types of research
  - a. Selection of subject
3. Scientific methods (Standardization)
4. Ideal requirements
5. Preparing the protocol
6. Sampling
  - a. Sampling methods
  - b. Sample size
7. Data
  - a. Type of data
  - b. Collection of data
  - c. Presentation of data
8. Documentation and Writing the report
9. Good clinical practices and ethics

### **Biostatistics**

- Introduction
- Applications
- Statistical averages
- Measures of Dispersion
- Distribution/Normal curve
- Tests of Significance
- Correlation and Interpretation

## ORAL MEDICINE & RADIOLOGY

### Introduction:

The subject of Oral Medicine and Radiology is unique in that it combines Oral Medicine and Radiology and sits at the interface between dentistry and medicine.

Oral Medicine deals in a specialist clinical area of care for treating head and neck medical diseases. Oral Medicine involves diagnosis and nonsurgical management of diseases of the orofacial complex and systemic and behavioral disorders that impact oral health. It includes and helps develop the skill for of pre-oncology evaluation and preparation of the affected patient besides early detection and treatment of potentially malignant disorders and anti-tobacco counselling

Oral and Maxillofacial Radiology deals with the acquisition and interpretation of radiographic imaging studies performed for diagnosis of treatment guidance for conditions affecting the maxillofacial region. It includes a thorough knowledge on techniques and interpretation for conventional as well as advanced maxillofacial imaging like Cone Beam Computed Tomography.

Forensic Odontology and Maxillofacial Radiology is adequately covered in the syllabus making the student competent for person identification, age estimation and other forensic requirements.

### **MDS-Part II**

#### COURSE CONTENTS:

##### A. Oral and Maxillofacial Radiology:

##### **Study includes Seminars/lectures/Demonstrations**

The educational programme provides;

- Experience of the diagnostic imaging investigations required to become technically competent in practical clinical work and to master the underlying the theoretical principles.
- The opportunity to develop relevant skills in OPG, CBCT, CT, MRI, Ultrasound and Nuclear Medicine relevant to Dental and Maxillofacial Radiology and to provide specialist opinion
- Experience of practice of clinical governance and audit (specialist and multidisciplinary) through evidence based medicine, which is the basis of radiology practice.

#### 1. **History of radiology, structure of x – ray tube, production of x – ray, property of x – rays.**

- Brief History of Radiology, Dental Radiography and its Pioneers Nature, structure and properties of matter, radioactivity, magnetism, ionizing radiation, radiofrequency radiation and ultrasound and how they interact with matter.
- Construction, function and operation of Medical and Dental Imaging equipment.
- Operating factors of imaging equipment, effects on indices of image quality and their inter-relationships.
- Principles of Quality Assurance and Audit in Medical and Dental Imaging
- Image Artifacts in Medical and Dental Imaging

2. **Biological effects of radiation**
  - Hazards and risks to patients, staff and public from Medical Imaging
3. **Radiation protection and ICRP guidelines**
4. **Accessories and Films and recording media,**
5. **Processing of image in radiology- conventional and digital**
6. **Design of x –ray department, dark room and use of automatic processing units**
  - AERB legislation and guidelines for Medical and Dental Imaging including room layout, and various licensing procedures.
7. **Faults of dental radiographs and concept of Ideal Radiograph**
8. **Quality assurance and audit in dental radiology**
9. **Intra- Oral Imaging Techniques**
10. **Projection Geometry & Localization by radiographic techniques**
11. **Extra – oral-imaging techniques**
12. **OPG and other radiologic techniques**
13. **Advanced imaging techniques like CBCT, CT Scan, MRI, Ultrasound, Fluoroscopy.**
14. **Radiographic consideration of**
  - Dental Caries
  - Periapical Lesions, Infections and Inflammatory Lesions affecting the Jaws
  - Periodontal diseases
  - Dental Anomalies
  - Systemic Diseases affecting the Jaws
  - TMJ Disorders
  - Disorders of Maxillary Sinus
  - Trauma and Fractures involving the dental structures and maxillofacial region
  - Aberrant calcifications in the Maxillofacial region
  - Disease of the bone Manifested in the Jaws
    - Fibrous Lesions
    - Other Bony Lesions
    - Cysts, Benign Tumors and Malignant Lesions affecting the Jaws
15. **Basic Anatomy of sectional imaging with case interpretations of CT/ CBCT/ MRI**
  - Applied radiographic anatomy of maxillofacial skeleton including;
    - TMJ
    - Paranasal Sinuses
    - Skull base
    - Cranial Nerves (V, VII, IX, X and XII)
    - Temporal Bone
    - Salivary Glands

- Thyroid Gland
  - Cervical Lymph Nodes
  - Soft Tissue Spaces
16. **Radio nucleotide techniques**
  17. **Contrast radiography in salivary gland, TMJ, and other radiolucent Pathologies**
  18. **Radiograph differential diagnosis of radiolucent, radio opaque and mixed Lesions.**
  19. **Art of radiographic report, writing and descriptors preferred in reports**
    - Typical and Atypical presentations of commonly occurring dento-alveolar lesions
    - Principles of differential diagnosis of maxillofacial bone lesions and soft tissue conditions
    - Tumour staging
    - Typical and atypical presentations of maxillofacial lesions, differential diagnosis and differentiate uncommon conditions mimicking common diagnosis
    - Co-relate with clinical presentations and diagnosis (Case Interpretation)
    - Effect and importance of radiographic diagnosis on the management and treatment selection
    - Current literature and guidelines on dento-alveolar investigations.
  20. **Digital radiology and its various types of advantages**
  21. **Application of Maxillofacial Radiology in Implant Planning**
    - Pre and Post Implant Placement
    - Radiographic evaluation of Implant site
    - Use and applications of various Implant planning software
  22. **Forensic Maxillofacial Radiology**

**B. Oral Medicine, therapeutics and laboratory investigations:**

**Study includes seminars / lectures / discussion**

The educational programme provides that;

- The student will be able to Elicit, identify, record and interpret an accurate history from patient of any age within the scope of Oral Medicine
- Perform appropriate Clinical examination
- Select and prescribe appropriate and relevant investigations- laboratory and imaging
- Appropriately interpret and apply in subsequent care for patient
- Competent in pre- radiation preparation and evaluation of patients

1. **Methods of clinical diagnosis of oral and systemic diseases as applicable to oral tissues including modern diagnostic techniques**
2. **Laboratory investigations including special investigations of oral and oro- facial diseases**
3. **Teeth in local and systemic diseases, congenital, and hereditary disorders**
4. **Oral manifestations of systemic diseases**
5. **Oro – facial pain** (odontogenic and non-odontogenic)
  - Manifestations and pathophysiology
  - Imaging studies and other investigations
  - Therapeutic Options- (drugs, psychological therapies, Contemporary and Alternative Medicines (CAM), operative interventions)
  - Neurological Dysfunction (altered cranial nerve function related or unrelated to other neurological abnormalities)
    - Localized Cranial Nerve Disease
    - Iatrogenic Cranial Nerve Disease
    - Diseases with extra-oral manifestations that present with cranial nerve disorders
  - Imaging studies and other investigations to study altered cranial nerve function
6. **Psychosomatic aspects of oral diseases**
7. **Management of medically compromised patients including medical emergencies in the dental chair**
  - Medically compromised patients; (acutely unwell adult and pediatric patients including simple faint, post-operative bleeding, hyperventilation, angina, myocardial infarction, acute asthma, anaphylaxis, diabetic emergencies, seizures, adrenal insufficiency etc.)
  - Physiology and/or Pathology related to medical emergencies
  - Pharmacology and adverse effect of drugs used in the management of medical emergencies
  - Handling of medical emergencies- drugs and equipment
8. **Oral Soft Tissue Infections:**
  - Normal Oral Flora
  - Diagnosis and Management with Medical Treatment and Monitoring of patients with Viral, Bacterial, Fungal and other Infections of the oral soft tissues. (Ulcerative and Vesiculobullous Lesions affecting the Oral Cavity).
  - Diagnosis and management of primary or reactivated infections of the oral soft tissues
  - Diagnosis and management of infections in immunocompromised patients.

9. **Congenital and Hereditary disorders involving tissues of oro facial region**
10. **Systemic diseases due to oral foci of infection**
11. **Hematological, Dermatological, Metabolic, Nutritional, & Endocrinal conditions with oral manifestations**
12. **Neuromuscular diseases affecting oro –facial region**
13. **Salivary gland disorders**
  - Structure and function of Healthy Salivary Glands and Saliva
  - Importance of Saliva as a diagnostic tool
  - Diagnosis and Management of disorders of Major and Minor Salivary Glands;
    - Localized Salivary Gland Disorders
    - Iatrogenic Salivary Gland Disorders
    - Diseases with extra-oral manifestations that present with salivary gland disorders
  - Diagnostic criteria for dry mouth
  - Imaging modalities and laboratory investigations for salivary gland diseases
  - Therapeutic and operative interventions
14. **Tongue in oral and systemic diseases**
15. **TMJ dysfunction and diseases**
16. **Concept of immunity as related to oro – facial lesions, including AIDS**
17. **Cysts, Neoplasms, Odontomes, and fibro – osseous lesions**
18. **Oral changes in Osteo – dystrophies and chondro – dystrophies**
19. **Potentially Malignant Disorders and Malignant lesions of oro facial region**
  - Diagnosis, Investigations, Biopsy and Medical Treatment of Potentially Malignant Disorders
  - Diagnosis, grading, biopsy, treatment planning and pre and post - radiation prophylaxis and care.
  - Therapeutic Radiation
20. **Allergy and other miscellaneous conditions**
21. **Pigmented Lesions of the Oral Cavity**
22. **Normal Breath Analysis, Breath as Diagnostic Tool and Halitosis**
23. **Therapeutics in oral medicine –clinical pharmacology**
  - Definitive management of localized benign disease and/or establish diagnosis including suspected oral soft tissue malignancy
  - Principles of safe, effective, quality-assured evidence based patient care
  - Choice of therapy and drugs;
    - i. Mode of action
    - ii. Mode of delivery- (topical, intralesional, systemic)

- iii. Indications and contraindications
  - iv. Adverse effects
  - v. Drug interactions
  - vi. Monitoring during therapy
    - Hypersensitivity reactions
    - Operative Interventions
      - i. Different operative techniques - (laser and cryotherapy)
      - ii. Biopsy techniques-
      - ii. Key features of local/short acting/general anesthesia
24. **Forensic Odontology**
25. **Computers in oral diagnosis and imaging**
26. **Evidence based oral care in treatment planning**
27. **Molecular Biology**

**Essential Knowledge:**

**Basic medical subjects, Oral Medicine, Clinical Dentistry, Management of Medical Emergencies, Oral Radiology techniques and Interpretation, Diagnosis of Oro – acial disorders**

## Scheme of Examination

### A.Theory

Part – I	Basic sciences paper	100 Marks
Part – II	Paper –I Paper-II, Paper-III	300 Marks (100 Marks for each paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration. Paper-I & Paper-II shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Paper- III will be on Essays. In Paper-III three Questions will be given and student has to answer any two questions. Each question carries 50 marks. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: \*

PART-I : Applied Basic Sciences: Applied Basic Sciences :Applied Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics

PART-II :

Paper-I : Oral and Maxillofacial Radiology

Paper-II : Oral Medicine, therapeutics and laboratory investigations

Paper-III : Essays (descriptive and analyzing type questions)

\*The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

B Practical / Clinical Examination : 200 Marks

1st Day Clinical

Clinical Case Presentation

2 Spotters 2 x 10 = 20 Marks

2 Short Cases 2 x 15 = 30 Marks

1 Long Case 1 x 50 = 50 Marks

Total = 100 Marks

Radiology Exercise

I. A) One Intra Oral Radiograph : 10 Marks

B) One Occlusal Radiograph :30 Marks

II. A) Two Extra Oral Radiograph :2 x 30 = 60 Marks Including technique and interpretation

2nd Day Viva Voce 100 Marks

i. Viva-Voce examination : 80 marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. Pedagogy Exercise : 20 marks

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

(1) Schedule of Examinations:-

University shall conduct MDS Examinations PART-I at the end of 1st Year and PART-II examination at

the end of Third year of MDS course as per the time schedule as prescribed by the University from time to time. The University shall not conduct more than two examinations in a year.

A) Scheme for Theory Examinations:-

PART – I

One paper shall be of 100 marks and duration of each paper shall be 03 hours. Pattern of question paper shall be as given below.

Sr. No	Nature of Question	Division of Marks	Total Marks
1	Write Answer of the following questions (a) (b) (c) (d) (e) (f) (g) (h) (i) (j)	10 x 10	100
	Total		100

PART – II

Three papers shall be of 100 marks and duration of each paper shall be 03 hours. Pattern of question paper shall be as given below.

Paper I & II

Sr. No	Nature of Question	Division of Marks	Total Marks
1	Write Long essay questions (a) (b)	02 x 25	50
2	Write Short essay (a) (b) (c) (d) (e)	05 x 10	50
	Total		100

Paper III

Sr. No	Nature of Question	Division of Marks	Total Marks
1	Essay (any two out the three) (a) (b) (c)	02 x 50	100
	Total		100

B) Scheme for Practical Examinations:-

Clinical/Practical examination is designed to test the clinical skill, performance and competence of the

candidate in skills such as communication, clinical examination, medical/dental procedures or prescription, exercise prescription, latest techniques, evaluation and interpretation of results so as to undertake independent work as a specialist. The practical/clinical examination in all the specialties shall be conducted for six candidates in two days.

Distribution of Marks at University Examinations:-

**DISTRIBUTION OF PRACTICAL MARKS**

Sr. No.	Head of Examination	Total Marks
1	Practical and Clinical Examination	200
	Viva Voce	
2	A. Viva Voce Examination      80 marks	
	B. Pedagogy Exercise      20 Marks	100
	Total	300

I) Viva Voce Examination:-

All examiners will conduct viva-voce jointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also

II) Pedagogy Exercise:-

A topic be given to each candidate in the beginning of clinical examination. He/she be asked to make a presentation on the topic for 8-10 minutes.

## **ORAL PATHOLOGY AND MICROBIOLOGY**

Oral Pathology deals with the nature of oral diseases, their causes, processes and effects. It relates the clinical manifestation of oral diseases to physiologic and anatomic changes associated with these diseases. It deals with commonly occurring pre malignancies and malignancies and serves commonly with the scientifically based information. It also deals with application of dental science to the administration of law and the furtherance of justice.

### **Objectives:**

- To train a graduate dental surgeon so as to ensure higher competence in both general and special pathology dealing with the nature of oral diseases, their causes, processes and effects.
- An oral pathologist is expected to perform routine histopathological evaluation of specimen relating to oral and peri oral tissues, to carry out routine diagnostic procedures including hematological, cytological, microbiological, immunological and ultra structural investigations.
- He/she is expected to have an understanding of current research methodology, collection and interpretation of data, ability to carry out research projects on clinical and or epidemiological aspects, a working knowledge on current database, automate data retrieval systems, referencing and skill in writing scientific papers.
- He/she is expected to present scientific data pertaining to the field , in conferences both as poster and verbal presentations and to take part in group discussions etc.
- He / she is expected to deal with the correct professional handling , examination, interpretation and presentation of dental an oral evidences which may came before the legal authorities.
- Since oral cancer continues to occupy a central stage of oral pathology, he/she should be capable of clinically correlating oral pre cancer with emphasis on early diagnosis using scientifically based information.

### **Broad outline of theoretical, clinical and practical courses:**

1. Study of principles of routine and special techniques used for histopathology including principles of histochemistry, immunohistochemistry, applied and theoretical biochemical basis of histochemistry as related to oral pathology.
2. Advanced histological an histopathological study of dental and oral tissues including embryonic considerations, clinical considerations, biology, histology, pathology, prognosis and management of oral oncology. concepts of oral pre malignancies.
3. Study of special and applied pathology of oral tissues as well as relation of local pathologic and clinical findings to systemic conditions.

4. Oral microbiology and their relationship to various branches of dentistry.
5. Oral microbiology affecting hard and soft tissues, Study of clinical changes and their significance to dental and oral diseases as related to oral pathology
6. Forensic odontology.
7. Inter institutional posting such as cancer hospital, dermatology clinics, regional HIV detection centres, sophisticated instrumentation centres for electron microscopy and other techniques.
8. Intra institutional posting in Oral Medicine and Radiology, Oralsurgery and Periodontology..
9. Maintenance of records of all post graduate activities.
10. Library dissertation.
11. University dissertation/Thesis.

#### GENERAL INFORMATION:

- The duration of the post graduate degree course in oral pathology and microbiology will be of three years.
- It will consist of three modules of one year each.
- The library dissertation should be completed by the end of tenth month and evaluation to be done at the end of first year.
- The university dissertation should start in second year and should be completed and submitted to the university six months before the final university examination.
- There shall be one institutional / university examination at the end of first year in the subject of Basic sciences subjects (Research Methodology and Biostatistics) .

## **A. Course Content**

### **FIRST YEAR**

#### **1. Biostatistics n Research methodology**

- Basic Principles of Biostatistics and study as applied to dentistry and Research
- Collection /organization of data/ measurement scales presentation data and analysis.
- Measures of central tendency
- Measures of variability
- Sampling and planning of health survey
- Probability, normal distribution and indicative statistics.
- Estimating population values.
- Tests of significance (Parametric/nonparametric qualitative methods).
- Analysis of variance.
- Association, correlation and regression.

#### **Approach:**

- Didactic lectures on Biostatistics an discussion on Research methodology.
- Two day Post graduate orientation course including General approach PG course ,library , Main dissertation, journal club topics selection and presentation, seminars, clinicopathological meetings, teaching technology and use of audiovisual aids.

#### **2. Applied Gross Anatomy of Head and Neck including Histology:**

- Temporomandibular Joint
- Trigeminal nerve and Facial nerve.
- Muscles of Mastication.
- Tongue
- Salivary glands
- Nerve supply, blood supply, lymphatic drainage and venous drainage of Oro dental tissues
- Embryology
  - Development of face, palate, mandible, maxilla, tongue and applied aspect of the same.
  - Development of teeth and dental tissues and developmental defects of oral and maxillofacial region and abnormalities of teeth.
- Maxillary sinus.
- Jaw muscles and facial muscles

**Genetics:**

Introduction , mode of inheritance, chromosomal anomalies of oral tissues and single gene disorder.

**Approach:**

- To be covered as didactic lectures.
- Posting in department of Anatomy for demonstration of dissection of Head, face and neck.

**3. Physiology (General and Oral)**

- Saliva
- Pain.
- Mastication
- Taste
- Deglutition
- Wound healing
- Vitamins (Influence on growth, Development and structure of Oral soft and hard tissues and para oral tissues.)
- Calcium metabolism.
- Theories of mineralization
- Tooth eruption and shedding
- Hormones((Influence on growth, Development and structure of Oral soft and hard tissues and para oral tissues.)
- Blood and its constituents.

**Approach:**

To be covered as didactic lectures.

**4. Cell Biology:**

- Cell structure and function (Ultra structural and molecular aspects), intercellular junctions, cell cycle and division, cell cycle regulators, cell to cell extra cellular matrix interactions.
- Detailed molecular aspects of DNA, RNA and intracellular organelles, transcription and translation and molecular biology techniques.

**Approach:**

To be covered as seminars.

## **5. General Histology:**

Light and electron microscopy considerations of epithelial tissues and gland, bone, hemopoietic system, lymphatic system, muscle, neural tissue, endocrinal system(Thyroid, pituitary, parathyroid)

### **Approach:**

- Topics to be covered as didactic lectures.
- Postings in the dept of Anatomy and histology for slide discussion.
- Record book to be maintained.

## **6. Biochemistry:**

- Chemistry of carbohydrates, lipids and proteins.
- Methods of identification and purification.
- Metabolism of carbohydrates, lipids and proteins.
- Biologicaloxidation.
- Various techniques- cell fractionation and ultra filtration, centrifugation, electrophoresis, spectrophotometry and radioactive techniques.

### **Approach:**

- Topics to be covered as didactic lectures.
- Posting I the dept of Biochemistry to familiarize with various techniques.
- Record book to be maintained.

## **7. General Pathology:**

- Inflammations and chemical mediators, thrombosis, embolism, necrosis, repair, degeneration , shock, hemorrhage, pathogenic mechanisms at molecular level and blood dyscrasias, carcinogenesis and neoplasia.

### **Approach:**

To be covered as seminars and didactic lectures.

## **8. General Microbiology:**

- Definitions of various types of infections.
- Routes of infection and spread.
- Sterilization, disinfection and antiseptics.
- Bacterial genetics.
- Physiology and growth microorganisms.

**Approach:**

- To be cover as didactic lectures.
- Record book to maintained.

**9. Basic Immunology:**

- Basic principles of immunity, antigens, and antibody reactions.
- Cell mediated immunity and humoral immunity.
- Immunology of hypersensitivity.
- Immunological basis of autoimmune phenomenon.
- Immunodeficiency with relevance to opportunistic infections.
- Basic principles of transplantation and tumour immunity.

**Approach:**

To be covered as didactic lecture.

**10. Systemic microbiology /Applied microbiology:**

Morphology, classification, pathogenicity, mode of transmission, methods of prevention, collection and transport of specimen for laboratory diagnosis, staining methods, common culture media, interpretation of laboratory reports and antibiotic sensitivity tests.

- Staphylococci
- Streptococci
- Corynebacterium diphtheria
- Mycobacteria.
- Clostridia, bacteroids and fusobacteria.
- Actinomycetales.
- Spirochetes.

**Virology:**

**General properties:** structure, broad classification of viruses, pathogenesis, pathology of viral infections.

**Herpes virus:** List of viruses included, lesions produced, pathogenesis, latency principles and laboratory diagnosis.

**Hepatitis virus:** List of viruses, pathogenesis, mode of infection, list of diagnostic tests an their interpretations, methods of prevention and control.

**Human Immunodeficiency Virus:** Structure with relevance to laboratory diagnosis, types of infection, laboratory tests and their interpretation, universal precautions, specific precautions and recent trends in diagnosis and prophylaxis.

**Mycology:**

- General properties of fungi, classification bases of diseases, superficial subcutaneous and deep opportunistic infections.
- General principles of fungal infections, diagnosis, rapid diagnosis method collection of sample and examination for fungi.

**Approach:**

- To be covered as seminars and didactic lectures.
- Posting in the dept of microbiology to familiarize with relevant diagnostic methods.
- Record book to be maintained.

**11. Oral Biology (Oral and Dental Histology)**

- Structure and functions of oral, dental and paraoral tissues including their ultra structure, molecular and biochemical aspects.
- Study of morphology of permanent and deciduous teeth.(Lectures and practicals to be given by P students)

**Approach:**

- To be covered as seminars and didactic lectures
- Record book to be maintained.

**12. Basic molecular biology and techniques.**

Experimental aspects – DNA extraction , PCR, Western blotting.

**Approach:**

- To be covered as didactic lectures.
- Posting in the centres where facilities are available for demonstration of routine , molecular biology techniques.
- Record book to be maintained.

**13. Basic Histotechniques and microscopy:**

- Routine hematological tests and clinical significance of the same.
- Biopsy procedures for oral lesions.
- Processing of tissues for paraffin embedding.

- Microtomes and principles of microtomy.
- Routine stains, principles and theories of staining techniques.
- Microscope and principle of microscopy.
- Light microscopy and various other types including electron microscopy.
- Methods of tissue preparation for ground sections, decalcified sections.

**Approach:**

- Topics to be covered as seminars.
- Preparation of ground and decalcified sections, tissue processing , sectioning and staining.
- Record book to be maintained.

**Academic Activities:**

- Submission of synopsis of dissertation in the 10 month of first year.
- Journal clubs and seminars to be presented by every post graduate student by turn.
- To attend the interdepartmental meetings.
- To attend dental camps based on survey to be done.
- Part 1 year ending examination to be conducted by college/university at the end of the academic year in optional subjects.

**SECOND YEAR**

**Oral Pathology**

- Developmental defects of oral and maxillofacial region and abnormalities of teeth.
- Dental caries(Introduction, Epidemiology, microbiology, cariogenic bacteria including properties, acid production in plaque, development of lesion, response to dentine-pulp unit, histopathology root caries, sequelae and immunology)
- Pulpal and perapical diseases.
- Infections of oral para oral regions (bacterial, viral and fungal infections)
- Non neoplastic disorders of salivary glands.
- Bone pathology
- Hematological disorders.
- Physical and chemical injuries, allergic and immunological diseases.
- Cysts of odontogenic origin
- Dermatologic diseases.
- Periodontal diseases.
- Oral manifestations of systemic diseases.
- Facial and neuromuscular disorder including TMJ disorders.
- Regressive alteration of teeth.

**Clinical Pathology:**

- Laboratory investigations-hematology, microbiology and urine analysis.
- Posting in clinical pathology to relevant training.

- Record book to be maintained.

**Specialized histotechniques and special stains:**

- Specialized staining technique for different tissues.
- Immunohistochemistry.
- Preparation of frozen sections and cytological smears.

**Approach:**

- Training to imparted in the department or in the institutions having facility.
- Record book to be maintained.

Recording of case history and clinicopathological discussions:

**Approach**

- Posting to the department of Oral Medicine, Medicine and Radiology and Oral and Maxillofacial surgery for 15 days.
- Record book to be maintained.

**Dermatology**

Study of selected mucocutaneous lesions-etio-pathogenesis, pathology clinical presentation and diagnosis.

**Approach:**

- Posting to dept dermatology of medical college for 15 days.
- Topics to be covered as seminars.
- Record book to be maintained.

**Oral Oncology**

Detailed study including pathogenesis, molecular and biochemical changes of various tumours, tumour like lesions and premalignant lesions affecting the hard and soft tissues of oral and paraoral tissues tumour markers.

**Approach:**

- To be covered as seminars..
- Posting in cancer centres to familiarize with the pathological appearances, diagnosis radiodiagnosis and treatment modalities.

**Oral Microbiology and Immunology**

- Normal Oral microbial flora
- Defence mechanism in the oral cavity
- Microbiology and immunology of dental caries and periodontal diseases.
- Tumour immunology
- Infections of pulp and periapical and periodontal tissues.
- Oral sepsis and bacteremia

- Infections of oral and paraoral regions (Bacterial,viral and fungal infections)

**Approach:**

To be covered as seminars.

**Forensic Odontology:**

Legal procedures like inquest, medicolegal evidences, post mortam examination of violence around mouth and neck, identification of deceased individuals –dentalimportance bitemaks, rugae patterns and lip prints.

**Approach:**

To be covered as seminars.

Histopathology slide discussion  
Record book to be maintained.

**Other topics in Oral Pathology**

- Detailed description of diseases affecting oral mucosa, teeth supporting tissues and jaws.
- Cysts of oral and paraoral regions.
- Systemic diseases affecting oral cavity.

**Approach:**

Seminars and slide discussions. Record book to be maintained. Training in histopathology slide reporting.

Experimental aspects of oral diseases

Approach: Posting desirable in the centres where animal experimentation is carried out to familiarize with laboratory techniques , upkeep and care of experimental animals.

**Academic activities:**

- Library assignment to be submitted at the end of 6 months.
- Commencement of dissertation work.
- Journal club and seminars to be presented by every PG students turn by turn.
- Clinicopathological discussions once in a month by every PG student.
- To attend the interdepartmental meetings.
- Lectures and practical classes and slide discussion to be taken for ii BDS students in oral anatomy and histology, physiology.

### **THIRD YEAR**

- Non neoplastic disorders of salivary glands.
- Bone pathology
- Physical and chemical injuries, allergic and immunological diseases.
- Cysts of odontogenic origin.
- Oral manifestation of systemic diseases.

#### **Approach:**

- To be covered as seminars
- Slide discussion of the same.
- Record book to be maintained.

#### **Academic activities:**

- Visit to centre where animal experimentation is carried out to familiarize with laboratory techniques , upkeep and care of experimental animals.
- Completion of dissertation work and submission of the same six months before the final university examination.
- Study of journals, internet browsing and group discussion to update knowledge in recent advances in oral pathology.
- Lectures and practical demonstration for third BDS students in oral pathology.
- Reporting of histopathology slides.

## **SYLLABUS OF PART – I**

### **SUBJECT: ORTHODONTICS AND DENTOFACIAL ORTHOPEDICS:**

#### **Applied Anatomy:**

- Prenatal growth of head:  
Stages of embryonic development, origin of head, origin of face, origin of teeth.
- Postnatal growth of head:  
Bones of skull, the oral cavity, development of chin, the hyoid bone, general growth of head, face growth.
- Bone growth:  
Origin of bone, composition of bone, units of bone structure, schedule of Ossification, mechanical properties of bone, roentgen graphic appearance of bone.
- Assessment of growth and development:  
Growth prediction, growth spurts, the concept of normality and growth, increments of growth, differential growth, gradient of growth, methods of gathering growth data. Theories of growth and recent advances, factors affecting physical growth.
- Muscles of mastication:  
Development of muscles, muscle change during growth, muscle function, facial development, muscle function and malocclusion
- Development of dentition and occlusion:  
Dental development periods, order of tooth eruption, chronology of permanent tooth formation, periods of occlusal development, pattern of occlusion.
- Assessment of skeletal age  
The carpal bones, carpal x - rays, cervical vertebrae .
- TMJ – Development & its anatomy

#### **Physiology:**

- Endocrinology and its disorders  
Growth hormone, thyroid hormone, parathyroid hormone, ACTH, pituitary gland hormones, thyroid gland hormones, parathyroid gland hormones.
- Calcium and its metabolism
- Nutrition-metabolism and their disorders: proteins, carbohydrates, fats, vitamins and minerals.
- Muscle physiology
- Craniofacial Biology
- Bleeding disorders in orthodontics: Hemophilia.
- Saliva
- Tooth structure and PDL
- Sleep physiology and sleep disorder
- Pain Pathways

- Deglutition and Stages
- Swallowing Patterns

### **Dental Materials:**

- Gypsum products: dental plaster, dental stone and their properties, setting reaction etc.
- Impression materials: impression materials in general and particularly of alginate impression material.
- Acrylics: chemistry, composition physical properties
- Composites: composition types, properties setting reaction
- Banding and bonding cements: Zn (P04)2, zinc silicophosphate, Zinc polycarboxylate, resin cements and glass ionomer cements
- Wrought metal alloys: deformation, strain hardening, annealing, recovery, recrystallization, grain growth, properties of metal alloys
- Orthodontic arch wires: stainless steel gold, wrought cobalt chromium nickel alloys, alpha & beta titanium alloys and new wires in orthodontics
- Elastics: Latex and non-latex elastics
- Applied physics, Bioengineering and metallurgy.
- Specification and tests methods used for materials used in Orthodontics
- Survey of all contemporary literature and recent advances in above – mentioned materials.
- Bite registration materials
- Thermoplastic resins
- Magnets
- Soldering and Welding

### **Genetics:**

- Cell structure, DNA, RNA, protein synthesis, cell division
- Chromosomal abnormalities
- Principles of orofacial genetics
- Genetics in malocclusion
- Molecular basis of genetics
- Studies related to malocclusion
- Recent advances in genetics related to malocclusion
- Genetic counseling
- Bioethics and relationship to Orthodontic management of patients.
- Genetics and syndromes

### **Applied Pharmacology:**

- NSAID's, Prostaglandin, Biphosphanate, Anti-Sialogogues
- Allergies
- Drugs for accelerated orthodontics

### **Research Methodology and bio statistics:**

- Statistical principles
- Data Collection
- Method of presentation
- Method of Summarizing
- Methods of analysis - different tests/errors
- Sampling and Sampling technique
- Experimental models, design and interpretation
- Experimental design
- Animal experimental protocol
- Principles in the development, execution and interpretation of methodologies in Orthodontics
- Critical Scientific appraisal of literature

### **Pathology:**

- Pain
- Inflammation
- Necrosis.
- Osteoporosis
- Wound Healing
- Fracture Healing
- Infection Control in Orthodontics / Sterilization
- Role of local and general factors in the etiology of malocclusion
- Developmental defects of the orofacial structures.

### **Physical Anthropology:**

- Evolutionary development of dentition
- Evolutionary development of jaws

## **ORTHODONTICS & DENTOFACIAL ORTHOPEDICS**

The training programme in Orthodontics is to structure and achieve the following four objectives

### **Knowledge:**

1. The dynamic interaction of biologic processes and mechanical forces acting on the stomatognathic system during orthodontic treatment
2. The etiology, pathophysiology, diagnosis and treatment planning of various common Orthodontic problems
3. Various treatment modalities in Orthodontics – preventive, interceptive and corrective.
4. Basic sciences relevant to the practice of Orthodontics
5. Interaction of social, cultural, economic, genetic and environmental factors and their relevance to management of oro – facial deformities
6. Factors affecting the long-range stability of orthodontic correction and their management
7. Personal hygiene and infection control, prevention of cross infection and safe disposal of hospital waste, keeping in view the high prevalence of Hepatitis and HIV and other highly contagious diseases.

### **Skills:**

1. To obtain proper clinical history, methodical examination of the patient, perform essential diagnostic procedures, and interpret them and arrive at a reasonable diagnosis about the Dento-facial deformities.
2. To be competent to fabricate and manage the most appropriate appliance – intra or extra oral, removable or fixed, mechanical or functional, and active or passive – for the treatment of any orthodontic problem to be treated singly or as a part of multidisciplinary treatment of oro-facial deformities.

### **Attitude:**

1. Develop an attitude to adopt ethical principles in all aspects of Orthodontic practice. Professional honesty and integrity are to be fostered
2. Treatment care is to be delivered irrespective of the social status, cast, creed and religion of the patients.
3. Willingness to share the knowledge and clinical experience with professional colleagues
4. Willingness to adopt, after a critical assessment, new methods and techniques of orthodontic management developed from time to time based on scientific research, which are in the best interest of the patient
5. Respect patients' rights and privileges, including patients right to information and right to seek a second opinion
6. Develop attitude to seek opinion from allied medical and dental specialists as and when required

### **Communication Skills:**

1. Develop adequate communication skills particularly with the patients giving them the various options available to manage a particular Dento-facial problem and to obtain a true informed consent from them for the most appropriate treatment available at that point of time.
2. Develop the ability to communicate with professional colleagues, in Orthodontics or other specialties through various media like correspondence, Internet, e-video, conference, etc. to render the best possible treatment.

### **COURSE CONTENT:**

The program outlined, addresses both the knowledge needed in Orthodontics and allied Medical specialties in its scope.

### **Spread of the Curriculum:**

For second year M.D.S course students need to study following topics and also learn clinical knowledge by studying different types of malocclusions and various treatment modalities to treat them successfully

**List of the Topics :**

**Orthodontic History:**

- a. Historical perspective,
- b. Evolution of orthodontic appliances,
- c. Pencil sketch history of Orthodontic peers
- d. History of Orthodontics in India

**Concepts of Occlusion and Esthetics:**

- a. Structure and function of all anatomic components of occlusion,
- b. Mechanics of articulation,
- c. Recording of masticatory function,
- d. Diagnosis of Occlusal dysfunction,
- e. Relationship of TMJ anatomy and pathology and related neuromuscular physiology.

**Etiology and Classification of Malocclusion:**

- a. A comprehensive review of the local and systemic factors in the causation of malocclusion
- b. Various classifications of malocclusion

**Dentofacial Anomalies:**

- a. Anatomical, physiological and pathological characteristics of major groups of developmental defects of the orofacial structures.

**Diagnostic Procedures and Treatment Planning in Orthodontics:**

- a. Emphasis on the process of data gathering, synthesis and translating it into a treatment plan
- b. Problem cases – analysis of cases and its management
- c. Adult cases, handicapped and mentally retarded cases and their special problems
- d. Critique of treated cases.

**Cephalometrics**

- a. Instrumentation
- b. Image processing
- c. Tracing and analysis of errors and applications
- d. Radiation hazards
- e. Advanced Cephalometrics techniques including digital cephalometrics
- f. Comprehensive review of literature
- g. Video imaging principles and application.
- h. CBCT-Cone-beam Computed Tomography Systems .

**Practice Management in Orthodontics:**

- a. Economics and dynamics of solo and group practices
- b. Personal management
- c. Materials management
- d. Public relations
  
- e. Professional relationship

- f. Dental ethics and jurisprudence
- g. Office sterilization procedures
- h. Community based Orthodontics.
- i. Orthodontic Office design
- j. Office sterilization procedures in pandemic situation
- k. Orthodontic office ethics

**Paper-II: Clinical**

**Orthodontics**

**Myofunctional**

**Orthodontics:**

- a. Basic principles
- b. Contemporary appliances –design, manipulation and management
- c. Case selection and evaluation of the treatment results
- d. Review of the current literature.

**Dentofacial Orthopedics:**

- a. Principles
- b. Biomechanics
- c. Appliance design and manipulation
- d. Review of contemporary literature

**Cleft lip and palate rehabilitation:**

- a. Diagnosis and treatment planning
- b. Mechanotherapy
- c. Special growth problems of cleft cases
- d. Speech physiology, pathology and elements of therapy as applied to orthodontics
- e. Team rehabilitative procedures.

**Biology of tooth movement:**

- a. Principles of tooth movement-review
- b. Review of contemporary literature
- c. Applied histophysiology of bone, periodontal ligament
- d. Molecular and ultra cellular consideration in tooth movement

**Orthodontic / Orthognathic surgery:**

- a. Orthodontist's role in conjoint diagnosis and treatment planning
- b. Pre and post-surgical Orthodontics
- c. Participation in actual clinical cases, progress evaluation and post retention study
- d. Review of current literature

**Orthodontic treatment techniques**

- a. History
- b. Fixed orthodontics
- c. Removable orthodontics
- d. Lingual mechano therapy
- e. Clear aligner

- f. Review of contemporary literature

**Ortho / Perio / Prosth/Endo inter relationship:**

- a. Principles of interdisciplinary patient treatment
- b. Common problems and their management

**Basic principles of mechanotherapy includes removable appliances and fixed appliances:**

- a. Design
- b. Construction
- c. Fabrication
- d. Management
- e. Review of current literature on treatment methods and results

**Applied preventive aspects in Orthodontics:**

- a. Caries and periodontal disease prevention
- b. Oral hygiene measures
  
- c. Clinical procedures

**Interceptive Orthodontics:**

- a. Principles
- b. Growth guidance
- c. Diagnosis and treatment planning
- d. Therapy emphasis on:
  - o Dento-facial problems
  - o Tooth material discrepancies
  - o Minor surgery for Orthodontics

**Evidence Based Orthodontics:**

**Orthodontic Management of TMJ problems, sleep-apnoea etc.:**

**Retention and relapse:**

- a. Mechanotherapy – special reference to stability of results with various procedures
- b. Post retention analysis
- c. Review of contemporary literature

**Recent Advances :**

- a. Use of implants
- b. Lasers
- c. Application of F.E.M.
- d. Distraction Osteogenesis
- e. Invisible Orthodontics
- f. 3D imaging Digital Orthodontics, Virtual Treatment Planning
- g. CAD-CAM bracket Customization
- h. Robotic Wire Bending
- i. Accelerated Orthodontics
  - o Surgical

- Device assisted or mechanical stimulation
- Biochemical Mediators
- j. Lingual Orthodontics
- k. Recent Advances in Wires

### **CLINICAL WORK:**

Once the basic pre-clinical work is completed in three months, the students can take up clinical cases and the clinical training.

**Each postgraduate student should start with a minimum of 50 fixed orthodontics cases and 20 removable including myofunctional cases of his/her own. Additionally he/she should handle a minimum of 25 transferred cases.**

The type of cases can be as follows:

- Removable active appliances
- Class-I malocclusion with Crowding
- Class-I malocclusion with bi-maxillary protrusion
- Class-II division – 1
- Class-II division – 2
- Class-III (Orthopedic, Surgical, Orthodontic cases)
- Inter disciplinary cases
- Removable functional appliance cases like activator, Bionator, functional regulator, twin block and new developments
- Fixed functional appliances – Herbst appliance, jasper jumper etc
- Dento-facial orthopedic appliances like head gears, rapid maxillary expansion, NiTi expander etc.,
- Appliance for arch development such as molar distalization
  
- Fixed mechano therapy cases (Begg, PEA, Tip edge, Edgewise, lingual)
- Retention procedures of above treated cases.

## Scheme of Examination

### Theory

Part – I	Basic sciences paper	100 Marks
Part – II	Paper –I Paper-II & Paper-III	300 Marks (100 Marks for each paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration. Paper-I & Paper-II shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Paper- III will be on Essays. In Paper-III three Questions will be given and student has to answer any two questions. Each question carries 50 marks. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: \*

**PART-I:** Applied Basic Sciences: Applied anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology, Applied Research methodology, Bio-Statistics and Applied Pharmacology

### **PART-II**

**Paper I:** Orthodontic history, Concepts of occlusion and esthetics, Child and Adult Psychology, Etiology and classification of malocclusion, Dentofacial Anomalies, Diagnostic procedures and treatment planning in Orthodontics, Practice management in Orthodontics

**Paper II :** Clinical Orthodontics

**Paper III :** Essays (descriptive and analyzing type questions)

*\*The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.*

**B. Practical / Clinical Examination : 200 Marks**

**Exercise No: 1 50 Marks**

**Functional Case :**

Selection of case for functional appliance and recording of construction bite. Fabrication and delivery of the appliance the next day.

**Exercise No: 2 : 50 Marks**

1. III stage with auxiliary springs/Wire bending of any stage of fixed orthodontics  
(OR)
2. Bonding of SWA brackets and construction of suitable arch wire.

**Exercise No. 3 75 Marks**  
**Display of records of the treated cases (Minimum of 5 cases)**

**Exercise No: 4 25 Marks**

**Long case discussions**

**Time allotted for each exercise:**

No	Exercise	Marks allotted	Approximate Time
1	Functional appliance	50	1 hour (each day)
2	III stage mechanics / Bonding and arch wire fabrication	50	1 hr 30 min
3	Display of case records (a minimum of 5 cases to be presented along with all the patients and records)	75	1 hour
4	Long cases	25	2 hours

**Note: The complete records of all the cases should be displayed (including transferred cases)**

**A. Viva Voce : 100 Marks**

i. **Viva-Voce examination: 80 marks**

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

ii. **Pedagogy Exercise: 20 marks**

A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes

# **SYLLABUS OF PART – I**

## **SUBJECT: PEDIATRIC DENTISTRY**

### **Applied Anatomy**

Development of oral cavity  
Development of maxillary and mandible jaws  
Development of palate  
Development of tooth  
Development of primary and permanent teeth  
Development of muscle of mastication  
Development of muscles of facial expression  
Development of spaces associated with head, neck and face region  
Development of course of arteries and nerves and lymphatic drainage supplying to head neck and face regions  
Development of temporo-mandibular joint, movement and its application to development of harmonious balanced occlusion  
Development of tongue  
Development of salivary glands  
Theories of teeth eruption  
Developmental anomalies in teeth and supporting structure

### **Physiology and Biochemistry**

Fluid and electrolyte balance in children  
Blood & its constituent  
Function of blood, blood grouping  
Blood diseases in children  
Vital parameters in children  
Endocrine system  
Mastication and Deglutition  
Pain pathways and its management  
Saliva- composition, function and its role in maintaining equilibrium of oral cavity

### **Pathology**

Inflammation  
Necrosis and gangrene

Allergy and hypersensitivity reaction  
Benign and malignant neoplasm in children  
Pathology of oral soft tissue and hard tissue  
Pathology of dental caries and periodontal diseases  
Attrition, abrasion and erosion of teeth  
Oral manifestation of systemic diseases  
Developmental and inflammatory cysts  
Shock  
Infectious diseases in children  
Repair and regeneration of pulpo-dentinal complex  
Immunity- type and immunoglobulins  
Mechanism of repair of initial caries (white spot lesion)

### **Microbiology**

Normal oral flora of oral cavity of children  
Role of micro-organism in dental caries and periodontal diseases  
Methods of Sterilization, disinfections and asepsis  
Hospital waste management  
Microflora related to others oral infections

### **Pharmacology**

Drugs used for general anesthesia, sedation and conscious sedation in children  
Local anesthesia in pediatric patients  
Analgesics, antipyretics and antibiotics in children  
Vitamin A, B complex, C, D and E,  
Trace element in prevention of dental caries  
Fluoride therapy (local and systemic for preventing dental caries)  
Dentifrices

### **Research Methodology and Bio Statistics:**

Statistics  
Biostatistics as applied to dentistry and research  
Sampling and sampling technique  
Application of various probability tests  
Data analysis and interpretation  
Reliability, Sensitivity and specificity diagnosis test and measurement  
Epidemiology of oral diseases

Different types of epidemiological studies

Research strategies

Designing of experimental study

Errors measurement in experiment

### **Growth & Development**

Growth and development – prenatal development of cranium, face, jaws, teeth and supporting structures

Cephalometric evaluation of growth

Dimensional changes in dental arches

Development of occlusion (primary and permanent dentition)

### **Dental Plaque**

Development of plaque

Oral microflora of plaque

Definition, composition, initiation, pathogenesis, biochemistry,

Different Plaque hypothesis

Acquired pellicle- its role in oral ecosystem

### **Genetics**

Cell Biology, DNA, RNA, protein synthesis, cell division

Chromosomal abnormalities

Principals of oral facial genetics

Genetics of dental caries and periodontal diseases

Genetics risks and bioethenic

Modes of inheritance, hereditary traits in families

# **PEDIATRIC DENTISTRY**

## **PAPER-I: CLINICAL PAEDODONTICS**

### **1. CONSCIOUS SEDATION, DEEP SEDATION & GENERAL ANESTHESIA IN PEDIATRIC DENTISTRY**

- Indications and Contraindications
- Pre-treatment Documentation and Assessment
- Techniques of conscious sedation, deep sedation & general anesthesia
- Monitoring of the Patient
- Recovery and Discharge
- Other Drugs
- Synergic & Antagonistic Actions of Various Drugs Used in Children
- Local anaesthesia

### **2. GINGIVAL & PERIODONTAL DISEASES IN CHILDREN**

- Normal Gingiva & Periodontium in children.
- Gingival & Periodontal diseases – Etiology, Classification, Risk factors, Pathogenesis, Systemic effects, Prevention & Management
- Maintenance of oral hygiene in infant and children

### **3. PEDIATRIC OPERATIVE DENTISTRY**

- Principles of operative dentistry
- Restorative materials used in past and present; along with recent advances in tooth-coloured materials.
- Modifications required for cavity preparation in primary and young permanent teeth
- Various isolation techniques
- Restoration of carious primary, young permanent and permanent teeth in children using various restorative materials
- Atraumatic Restorative Treatment
- Various crowns used in pediatric dentistry- (Stainless steel, Zirconia crowns, Pado-strip crowns, Polycarbonate & Resin Crowns / Veneers, fibre post systems etc)

### **4. PEDIATRIC ENDODONTICS**

- Diagnosis of pulpal diseases and their management
- Endodontic treatment for primary teeth- Pulp capping, Pulpotomy, Pulpectomy
- Endodontic treatment for young permanent teeth and permanent teeth -

Pulp capping, Pulpotomy, Pulpectomy, Apexogenesis, Apexification, Regenerative endodontic therapy

- Controversies & recent concepts in pediatric endodontics
- Recent advances in diagnostic aids for assessment of pulpal vitality
- Endodontic instruments (Hand and Rotary) for Primary, young permanent and permanent teeth
- Endodontic irrigants
- Irrigation devices
- Sonic and ultrasonic agitation
- Root canal filling materials for primary teeth
- Recent advances in pediatric endodontics

## **5. TRAUMATIC INJURIES IN CHILDREN**

- Traumatic dental injury- Prevalence, Causes and Predisposing factors, classification, history and examination
- Sequelae & reaction of teeth to trauma
- Traumatic injuries to anterior teeth and its management
- Management of jaw fractures in children
- Sports related dental injuries and its management.

## **6. INTERCEPTIVE ORTHODONTICS**

- Concepts of occlusion and esthetics: Structure and function of all anatomic components of occlusion, mechanics of articulations, recording of masticatory function, diagnosis of Occlusal dysfunction, TMJ anatomy, related neuromuscular physiology and pathology.
- Myofunctional appliances: Basic principles, contemporary appliances: Design & Fabrication
- Fixed and removable orthodontic appliances: Basic principles, contemporary appliances: Design & Fabrication
- Case selection & diagnosis in interceptive Orthodontics (Cephalometrics, Image processing, Tracing, Radiation hygiene, Video imaging & advance Cephalometric techniques)
- Recognition and management of normal and abnormal developmental occlusions in primary, mixed and permanent dentitions in children (Occlusal Guidance)
- Biology of tooth movement: A comprehensive review of the principles of teeth movement. Review of contemporary literature. Histopathology of bone and Periodontal ligament, Molecular and ultra-cellular consideration in tooth movement

- A comprehensive review of the local and systemic factors in the causation of malocclusion
- Space Management:
  - Etiology, Diagnosis of space problems, Space analysis, Biomechanics
  - Objectives, Classification, Requisites
  - Indications and Contraindications
  - Advantages and Disadvantages
  - Space Maintainers and Space Regainers
  - Planned extraction in interceptive orthodontics

## **7. ORAL HABITS IN CHILDREN**

- Definition, Etiology & Classification
- Clinical features of digit sucking, tongue thrusting, mouth breathing & various other oral habits in children affecting oro-facial structure
- Management of oral habits in children

## **8. DENTAL CARE OF CHILDREN WITH SPECIAL NEEDS**

- Definition, Etiology, Classification, Clinical features and behavioural aspects of specially abled children (physically, mentally and medically handicapped child)
- Dental considerations of special children
- Management of infant/children with cleft lip and palate (feeding plate, naso-alveolar moulding, Speech rehabilitation)
- Oral manifestations of Systemic Conditions in Children & their Management
- Acquired immunodeficiency syndrome (AIDS)
- Management of children with genetic disorders

## **9. MINOR ORAL SURGICAL PROCEDURES IN CHILDREN**

- Exodontia
- Minor oral surgical procedures in children for-
  - Frenal abnormalities,
  - Odontogenic infections
  - Cystic lesions in children
  - Odontogenic and non-odontogenic tumors
  - Abnormalities of oral structures
  - Other infections in children

## **10. DENTAL RADIOLOGY AS RELATED TO PEDIATRIC DENTISTRY**

- Oral examination, diagnosis and treatment planning- case history taking

- Principles of Radiographic Examination
- Conventional Intraoral Radiographic Techniques
- Digital Radiography
- Extraoral Radiography

#### **11. PEDIATRIC ORAL PATHOLOGICAL CONDITIONS IN CHILDREN**

- Developmental Disturbances of Teeth and Surrounding Structures

#### **12. CONGENITAL ABNORMALITIES IN CHILDREN**

- Definition, Classification, Clinical features and Management

#### **13. MEDICAL EMERGENCIES IN CHILDREN**

- Vital Signs
- Basic Life Support
- Various medical emergencies and
- Management

#### **14. PROSTHETIC MANAGEMENT IN PEDIATRIC DENTISTRY**

#### **15. ADVANCES IN PEDIATRIC DENTISTRY**

#### **16. DENTAL MATERIALS USED IN PEDIATRIC DENTISTRY**

#### **17. SETTING UP OF PEDODONTIC & PREVENTIVE DENTISTRY CLINIC**

#### **18. LASERS IN PEDIATRIC DENTISTRY**

#### **PAPER-II:**

#### **PREVENTIVE AND COMMUNITY DENTISTRY AS APPLIED TO PEDIATRIC DENTISTRY**

##### **1. CHILD PSYCHOLOGY**

- Introduction to paediatric dentistry
- Fear, anxiety, apprehension & its management
- Theories of child psychology
- Social and emotional development of child

##### **2. BEHAVIOR MANAGEMENT**

- Definitions, Fundamentals of Behaviour Management
- Behaviour Patterns of the Child

- Behaviour Modification/ Guidance Techniques-
- Non- pharmacological and pharmacological behaviour management methods

### **3. CHILD ABUSE & DENTAL NEGLECT**

### **4. PREVENTIVE PEDODONTICS**

- Chair side preventive measures for dental diseases
- Epidemiology of dental caries in India
- Saliva and oral health
- Pit and fissure sealants
- Non-restorative management of dental caries- Silver diamine fluoride
- Caries Vaccine
- Oral hygiene measures
- Dental Health education
- Diet and Dental Caries
- Diet Counselling

### **5. CARIOLOGY**

- Historical background
- Dental Caries- Definition, etiology and classification
- Caries pattern in primary, young permanent and permanent teeth
- Pathogenesis of dental caries
- Caries risk assessment
- Caries activity tests
- Sugar studies
- Diagnosis of dental caries
- Early childhood caries-Definition, Etiology, Pathogenesis, Clinical features, Complications and its management
- Rampant caries
- Role of diet and nutrition in Dental Caries
- Dietary modifications & Diet counselling
- Subjective & objective methods of Caries detection with emphasis on Caries prediction, Caries susceptibility & their clinical Applications

### **6. DENTAL HEALTH EDUCATION & SCHOOL DENTAL HEALTH PROGRAMMES**

- Dental health concepts
- Effects of civilization and environment
- Dental Health delivery system
- Public Health measures related to children along with principles of Pediatric and Preventive Dentistry

## **7. EPIDEMIOLOGY**

- Concepts
- Methods of recording & evaluation of various oral diseases
- Various national & global trends of epidemiology of oral diseases

## **8. FLUORIDE IN DENTISTRY**

Historical background of fluoride

Availability and Physiology and mechanism of fluoride

Systemic fluorides

Topical fluorides

Forms of fluoride

Fluoride toxicity and Management

Fluoride analytical methods

Defluoridation

## **9. VACCINATION SCHEDULE**

## **10. PROBIOTICS**

## **11. INFECTION CONTROL IN PEDIATRIC DENTISTRY**

## **12. MEDICO-LEGAL CONSIDERATIONS**

## **13. COUNSELLING IN PEDIATRIC DENTISTRY**

## **14. PRINCIPLES OF BIO-STATISTICS & RESEARCH METHODOLOGY & UNDERSTANDING OF COMPUTERS AND PHOTOGRAPHY**

### **PAPER-III: ESSAYS (DESCRIPTIVE AND ANALYZING TYPE QUESTIONS)**

The topics assigned to the different papers are generally evaluated under those sections.

However, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics

Any topic from Paper I and paper II can be

**MUHS EXAM**  
**SCHEME 1 OF EXAMINATION**  
**MDS Part II**

<b>Paper I / Paper II</b>	<b>Total marks 75</b>
<b>Questions</b>	<b>Marks</b>
<b>Long answer</b>	<b>40 marks</b>
Question 1	20 marks
Question 2	20 marks
<b>Short answer</b>	<b>35 marks</b>
Question 1	7 marks
Question 2	7 marks
Question 3	7 marks
Question 4	7 marks
Question 5	7 marks
<b>PAPER III</b>	
<b>ESSAY</b>	<b>75 marks</b>
Question 1	
OR	
Question 2	

**MUHS EXAM**  
**SCHEME 2 OF EXAMINATION**  
**MDS Part II**

**Paper I / Paper II** **Total marks 100**

**Questions** **Marks**

**Long answer** **50 marks**

Question 1 25 marks

Question 2 25 marks

**Short answer** **50 marks**

Question 1 10 marks

Question 2 10 marks

Question 3 10 marks

Question 4 10 marks

Question 5 10 marks

**PAPER III**

**ESSAY** **100 marks**

Attempt any 2 questions

Question 1 50 marks

Question 2 50 marks

Question 3

**SCHEME 3 OF EXAMINATION**

**MDS Part II**

**Paper I / Paper II** **Total marks 100**

**Questions** **Marks**

**Long answer** **60 marks**

Question 1 20 marks

Question 2 20 marks

Question 3 20 marks

**Short answer** **40 marks**

Question 1 8 marks

Question 2 8 marks

Question 3 8 marks

Question 4 8 marks

Question 5 8 marks

**PAPER III**

**ESSAY** **100 marks**

Attempt any 2 questions

Question 1 50 marks

Question 2 50 marks

Question 3

# **SYLLABUS OF PART – I**

## **SUBJECT: PERIODONTICS**

### **Applied Anatomy:**

- **Evolution and Development of the Periodontium**
  - a. Evolution of Tooth and Related Structures
  - b. Parts of Periodontium
  - c. Development of Cementum
  - d. Development of Alveolar Bone
  - e. Development of Periodontal Ligament
  - f. Development of Gingiva
  - g. Molecular Components of Periodontal development
- **Micro and Macro structural anatomy and biology of the periodontal tissues**
  - a. Gingiva
    - Macro – parts of gingiva, sulcus, GCF
    - Micro – epithelium, connective tissue: cells, fibers, ECM
  - b. Alveolar Bone, Periodontal ligament, cementum
- **Age Changes in the Periodontal Tissues**
  - a. Effects of Aging on Periodontium
  - b. Effects of Aging on the Progression of Periodontal disease
  - c. Effects of Aging on Response to Treatment of Periodontal Tissues
- **Anatomy of the Periodontium**
  - a. Macroscopic and microscopic anatomy
  - b. Blood supply of the Periodontium
  - c. Lymphatic system of the Periodontium
  - d. Nerves of the Periodontium

- **Temporomandibular Joint, Maxillae and Mandible**

- a. Structure of Joint- Articular Surfaces, Ligaments, Articular Disc
- b. Relations of Temporomandibular Joint
- c. Blood Supply
- d. Nerve Supply
- e. Movements

- **Nerves of Periodontics**

- a. Trigeminal nerve: Origin, Motor and sensory Root, Branches and Type of Nerve
- b. Maxillary Nerve: Origin, Branches, Supply
- c. Mandibular Nerve: Origin, Branches, Supply
- d. Applied Anatomy

- **Tongue:**

- a. Structure: parts of tongue, papillae of tongue
- b. Muscles of tongue
- c. Histology of tongue,
- d. Development,
- e. Blood and nerve supply

- **Hard and Soft Palate**

- a. Clinical Anatomy:
- b. Hard Palate - Structure: Margins and Surfaces
  - i) Vessels and Nerves: Arteries, Veins, Nerves and Lymphatics
- c. Soft palate - Structure: Margins and Surfaces
  - i) Muscles of Soft Palate
  - ii) Vessels and Nerves: Arteries, Veins, Nerves and Lymphatics
  - iii) Action of muscles of Soft palate
- d. Development of Palate
- e. Clinical Significance and Applied Aspects

- **Pharynx, Larynx and Tonsils**

a. Pharynx: Structure and parts of pharynx, Waldeyer's Lymphatic Ring

b. Larynx:

i) Structure: Cartilages and Muscles

ii) Movements

iii) Clinical significance: Mechanism of Speech

c. Tonsils: Structure, Vessels and Nerve Supply, Development

- **Muscles of Mastication**

a. Classification: Main and Accessory Muscles of Mastication

b. Main Muscles of Mastication: Origin, Insertion, Nerve Supply and Blood Supply

c. Action of Muscles of Mastication

d. Clinical Significance and Applied Aspects

- **Salivary Glands**

a. Classification of Salivary Glands

b. Anatomy of Salivary Glands

c. Development of Salivary Gland

d. Saliva

e. Clinical Significance and Applied Aspects

- **Paranasal Air Sinuses:**

a. Classification, Development

b. Maxillary sinus: anatomy, embryology, functional importance, clinical evaluation, applied aspects

- **Nervous System, Cranial Nerves**

- **Mandible:**

a. Anatomy

b. Attachment and relations

c. Foramina and relations to nerves and vessels

d. Ossification

e. Age changes

## **Maxilla:**

- a. Anatomy
- b. Attachment and relations
- c. Normal features
- d. Ossification
- e. Age changes

### • **Facial Muscles**

- a. Classification and types
- b. Nerve supply
- c. Muscles producing common facial expression
- d. Clinical aspects

### • **Lymphatic System**

- a. Components of Lymphatic system
- b. Functions of Lymphatic system
- c. Lymphatic drainage of Head and Neck
- d. Clinical Aspects

### • **Physiology:**

1. Blood: composition, cells, functions, disorders
2. Anemia- types, polycythemia
3. Respiratory system – Acknowledge of the respiratory disease which are a cause of periodontal diseases (periodontal Medicine)
4. Cardiovascular system
  - a. Cardiac cycle, cardiac output, venous return
  - b. Blood pressure
  - c. Normal ECG
  - d. Shock
5. Endocrinology – thyroid, pancreas, adrenaline, growth hormones, sex hormones and hormonal influences on Periodontium
6. Gastrointestinal system
  - a. Salivary secretion – composition, function & regulation
7. Nervous System
  - a. Pain pathways
  - b. Local anesthesia: Classification, composition, mechanism, complications

- c. Tongue – Taste buds, primary taste sensation & pathways for sensation
- 8. Cell: Structure, function, injury, transport of substances
- 9. Food and Nutrition
- 10. Mastication and deglutition
- 11. Immunity: Types, Cells
- 12. Allergy and hypersensitivity reactions
- 13. Haemostasis- mechanism, clotting factors, coagulation, disorders, haemostatic agents
- 14. Anticoagulant and anti-platelet agents
- 15. Salivary glands: secretions and mechanism of salivary secretion
- 16. Calcium and phosphate metabolism, formation of bone and teeth, regulation of vitamin D
- 17. Liver- physiology and functions
- 18. Thyroid
  - a. Synthesis and secretion of thyroid hormones
  - b. Regulation of thyroid hormones
  - c. Physiology and functions
- 19. Tongue
  - a. Taste buds
  - b. Pathway for taste
  - c. Taste sensations and chemical constituents
  - d. Taste transduction
  - e. Applied physiology: Abnormalities of taste sensation
- 20. Diabetes Mellitus
  - a. Classification
  - b. Complication
  - c. Pathogenesis
  - d. 2 way relation between diabetes mellitus and periodontitis

### **Biochemistry:**

- 1. Carbohydrates: classification, functions, metabolism
  - 2. Proteins: functions, metabolism
  - 3. Lipids: classification, functions, metabolism
- 4. Vitamins: classification, functions, dietary sources, deficiency
- 5. Diet and nutrition and Periodontium
  - a. Macro and micro-nutrients and its effect on periodontium
- 6. Biochemical tests and their significance

## 7. Calcium and Phosphorus

## 8. Connective Tissue:

- a. Collagen-function
- b. Structure
- c. Biosynthesis and abnormalities

## 9. Diet and Nutrition

- a. Definition of diet and nutrition
- b. Balanced diet
- c. Components of food and their deficiency diseases
- d. Nutrient value of food
- e. Food pyramid

## 10. PCR and its Application

- a. Principle
- b. Steps
- c. Advantages and limitations

## 11. ELISA and its Application

- a. Principle
- b. Methods
- c. Type
- d. Application

## 12. Basal Metabolic Rate

- a. Definition
- b. Measurement
- c. Normal values of BMR
- d. Factors affecting BMR

## **Pathology:**

1. Cell structure and metabolism
2. Inflammation- details of cellular events, chemical mediators: promoters and suppressors
3. Repair, regeneration, necrosis and degeneration
4. Immunity system, organs, cells and their functions
5. Hypersensitivity reactions
6. Circulatory disturbances – edema, haemorrhage, shock, thrombosis, embolism, infarction

and hypertension

7. Disturbances of nutrition, vitamin physiology and deficiencies

8. Diabetes mellitus, classification, etiology, pathogenesis, risk factors, clinical features, complications, diagnosis

9. Cellular growth and differentiation, regulation

10. Lab investigations

11. Neoplasia, Metastasis

a. Nomenclature and classification of tumors

b. Etiology and pathogenesis

c. Pathologic diagnosis of cancer

12. Healing

a. Regeneration

b. Repair

c. Wound healing

d. Healing after periodontal surgeries

13. Blood Disorders

a. Hemorrhagic diathesis due to vascular disorders

b. Hemorrhagic diathesis due to platelet disorders

c. Hemorrhagic diathesis due to fibrolytic defects

d. Disseminated intravascular coagulation (DIC)

e. Coagulation disorders

f. Investigations of haemostatic function

## **Microbiology:**

1. General bacteriology: morphology, staining techniques, bacterial anatomy, growth and multiplication of bacteria, bacterial nutrition

2. Sterilization and disinfection, sterilizing agents, testing of disinfectants

3. Culture media,

a. Types of culture media

b. Culture methods

4. Immunology:

a. Types of immunity

b. Antigens and antibodies

- c. Antigen-antibody reactions
- d. Complement system
- e. Structure
- f. Functions of immune system

5. Infection:

- a. Classification
- b. Sources of infection
- c. Methods of transmission
- d. Predisposing factors for microbial pathogenicity
- e. Types of infectious diseases

6. Systemic bacteriology with special emphasis on oral microbiology – staphylococci, genus actinomyces and periodontal microbiology

7. Virology

- a. General properties of viruses
- b. Classification and nomenclature
- c. Cultivation methods
- d. Viral infections, pathogenesis of viral infections, host response to viral infections
- e. Herpes, Hepatitis, virus, HIV virus

8. Mycology

- a. Candidiasis

9. Applied microbiology

10. Healthcare associated infections

11. Recent advances in Diagnostic microbiology

12. Antibiotic sensitive testing

Bio medical waste management

**Pharmacology:**

1. General pharmacology

a. Definitions – pharmacokinetics with clinical applications, routes of administration including

local drug delivery in Periodontics

b. Adverse drug reactions and drug interactions

2. Detailed pharmacology of

a. Analgesics – opioid and non -opioid

- b. Local anesthetics
- c. Haematinics and coagulants, Anticoagulants
- d. Vitamin D and Calcium preparations
- e. Antidiabetic drugs
- f. Steroids
- g. Antibiotics
- h. Antihypertensive
- i. Immunosuppressive drugs and their effects on oral tissues
- j. Antiepileptic drugs

3. Brief pharmacology, dental use and adverse effects of

- a. General anaesthetics
- b. Antipsychotics
- c. Antidepressants
- d. Anxiolytic drugs
- e. Sedatives
- f. Antiepileptics
- g. Antihypertensives
- h. Anti anginal drugs
- i. Diuretics
- j. Hormones
- k. Pre-anesthetic medication

4. Drugs used in Bronchial asthma cough

5. Drug therapy of

- a. Emergencies
- b. Seizures
- c. Anaphylaxis
- d. Bleeding
- e. Shock
- f. Diabetic ketoacidosis
- g. Acute Addisonian crisis

6. Dental Pharmacology

a. Antiseptics

b. Astringents

c. Sialogogues

d. Disclosing agents

e. Antiplaque agents

f. Anticalculus Agents

g. Dentifrices

7. Fluoride pharmacology

8. Vaccine

### **Research Methodology and Biostatistics:**

1. Introduction, definition and branches of biostatistics
  2. Collection of data, sampling, types, bias and errors
  3. Compiling data-graphs and charts
  4. Measures of central tendency (mean, median and mode), standard deviation and variability
  5. Tests of significance (chi square test, 't' test, Z-test, ANOVA)
  6. Null hypothesis
  7. Presentation of data, measures of dispersion
  8. Research methodology - introduction, purpose, categories, scientific methods, hypothesis formulations, writing protocol
  9. Correlation, regression
  10. Index- requirement, classification, Gingival and Periodontal Indices
  11. Clinical trials
  12. Epidemiology- aims and principles, tools of measurement, methods, uses
- Survey procedures, types of survey, uses, steps in surveying

# PERIODONTOLOGY

## CLINICAL AND THERAPEUTIC PERIODONTOLOGY AND ORAL IMPLANTOLOGY

- 1 **Classification of periodontal diseases & conditions affecting periodontium.**
  - a) Gingival diseases
  - b) Periodontitis
  - c) Necrotizing periodontal diseases
  - d) Abscesses of periodontium
  - e) Periodontitis associated with endodontic lesions
  - f) Developmental or acquired deformities & conditions
- 2 **Fundamentals in the methods of periodontal disease epidemiology.**
  - a) Need for epidemiology
  - b) Epidemiologic study designs
  - c) Causes/ etiology
  - d) Diagnosis
- 3 **Defence mechanisms of gingiva.**
  - a) Sulcular fluid
  - b) Leukocytes in the dentogingival area
  - c) Saliva
- 4 **Periodontal microbiology.**
  - a) Oral cavity from a microbe's perspective
  - b) Bacteria and their biofilm mode of living
  - c) Characteristics of biofilm bacteria (life in "slime city")
  - d) Bacterial transmission and translocation
  - e) Nonbacterial inhabitants of the oral cavity
  - f) Microbiologic specificity of periodontal diseases
  - g) Transition from health to disease
  - h) Virulence factors of periodontal pathogens
  - i) Future advances in periodontal microbiology
- 5 **Basic concepts of inflammation and immunity.**
  - a) Inflammation
  - b) Acute inflammation is self-limited
  - c) Unresolved chronic inflammation in periodontal diseases
  - d) Systemic link
  - e) Therapeutic actions of resolution mediators

- 6 **Microbial interactions with the host in periodontal diseases.**
- a) Microbiologic aspects of the microbial –host interaction
  - b) Immunologic aspects of the microbial interaction with the host
  - c) Microbiology and immunology in gingival health
  - d) Microbiology and immunology in periodontal disease
- 7 **Pathogenesis of plaque associated periodontal diseases.**
- a) Histopathology of periodontal disease
  - b) Inflammatory responses in the periodontium
  - c) Linking pathogenesis to clinical signs of disease
  - d) Resolution of inflammation
  - e) Immune responses in periodontal pathogenesis
  - f) Concept of host susceptibility
- 8 **Dental calculus.**
- a) Supragingival & subgingival calculus
  - b) Clinical appearance, prevalence and distribution
  - c) Calculus formation and structure
  - d) Attachment to tooth surfaces and implants
  - e) Calculus composition
  - f) Clinical implications
  - g) Materia alba, food debris, dental stains
  - h) Role of iatrogenic and other local factors
- 9 **Genetic factors associated with periodontal disease.**
- a) Introduction and definitions
  - b) Evidence for the role of genetics in periodontitis
  - c) Heritability of aggressive periodontitis (early onset periodontitis)
  - d) Heritability of chronic periodontitis (adult periodontitis)
  - e) The twin model
  - f) Human genes and polymorphisms
  - g) Genetics in relation to disease in general
  - h) A major disease gene associated with periodontitis
  - i) Modifying disease genes in relation to periodontitis
  - j) Cytokine gene polymorphisms
  - k) IL-1 gene polymorphisms
  - l) TNF- $\alpha$  gene polymorphisms
  - m) IL-10 gene polymorphisms
  - n) FCYR gene polymorphisms
- 10 **Influence of systemic conditions on the periodontium.**
- a) Endocrine disorders and hormonal changes

- b) Hematologic disorders and immunodeficiencies
  - c) Cardiovascular diseases
  - d) Genetic disorders
  - e) Stress and psychosomatic disorders
  - f) Nutritional influences
  - g) Medications
  - h) Other systemic conditions
- 11 **Role of environmental factors in the etiology of periodontal disease.**
- 12 **Stress and periodontal diseases.**
- 13 **Occlusion and periodontal disease.**
- a) Adaptive capacity of the periodontium to occlusal forces
  - b) Trauma from occlusion
  - c) Stages of tissue response to increased occlusal forces
  - d) Effects of insufficient occlusal force
  - e) Reversibility of traumatic lesions
  - f) Effects of excessive occlusal forces on dental pulp
  - g) Relationship between plaque induced periodontal diseases and trauma from occlusion
  - h) Pathologic tooth migration
- 14 **Smoking and tobacco in the etiology of periodontal diseases.**
- a) The smoking epidemic
  - b) Effects of smoking on the prevalence and severity of periodontal diseases
  - c) Effects of smoking on the etiology and pathogenesis of periodontal disease
  - d) Effects of smoking on the response to periodontal therapy
  - e) Effects of smoking cessation on periodontal treatment outcomes
- 15 **AIDS and periodontium.**
- a) Epidemiology & demographics
  - b) Classification & staging
  - c) Pathogenesis
  - d) Oral and periodontal manifestations of human immunodeficiency virus
  - e) Infection
  - f) Dental treatment complications
  - g) Gingival and periodontal diseases
  - h) Periodontal treatment protocol

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**Periodontal medicine.**

- a) Pathobiology of periodontitis
- b) Focal infection theory revisited
- c) Evidence –based clinical practice
- d) Subgingival environment as a reservoir of bacteria
- e) Periodontal disease and mortality
- f) Periodontal disease and coronary heart disease/atherosclerosis
- g) Periodontal disease and stroke
- h) Periodontal disease and diabetes mellitus
- i) Periodontal disease and pregnancy outcome
- j) Periodontal disease and chronic obstructive pulmonary disease
- k) Periodontal disease and acute respiratory infection
- l) Periodontal medicine and clinical practice

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**Gingival inflammation.**

- a) Stage I gingival inflammation: the initial lesion
- b) Stage II gingival inflammation: the early lesion
- c) Stage III gingival inflammation: the established lesion
- d) Stage IV gingival inflammation: the advanced lesion
- e) Clinical features of gingivitis
- f) Course and duration

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**Gingival enlargement.**

- a) Inflammatory enlargement.
- b) Drug-induced gingival enlargement
- c) Idiopathic gingival enlargement
- d) Enlargements associated with systemic diseases
- e) Neoplastic enlargements
- f) False enlargements

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**Acute gingival infections.**

- a) Necrotizing ulcerative gingivitis
- b) Primary herpetic gingivostomatitis
- c) Pericoronitis

20 **Desquamative gingivitis and oral mucous membrane diseases.**

- a) Chronic desquamative gingivitis
- b) Diagnosis of desquamative gingivitis: a systematic approach
- c) Diseases that can manifest as desquamative gingivitis
- d) Drug-related eruptions
- e) Miscellaneous conditions that mimic desquamative gingivitis

21 **Gingival diseases in the childhood.**

- a) Periodontium of the primary dentition
- b) Periodontal changes associated with normal development
- c) Gingival diseases of childhood
- d) Periodontal diseases of childhood
- e) Gingival manifestation of systemic disease in children
- f) Oral mucosa in childhood diseases
- g) Therapeutic considerations for pediatric patients

22 **Periodontal pocket.**

- a) Classification
- b) Clinical features
- c) Pathogenesis
- d) Histopathology
- e) Periodontal disease activity
- f) Site specificity
- g) Pulp changes associated with periodontal pockets
- h) Relationship of attachment loss and bone loss to pocket depth
- i) Area between base of pocket and alveolar bone
- j) Relationship of pocket to bone
- k) Periodontal abscess
- l) Lateral periodontal cyst

23 **Bone loss and patterns of bone destruction.**

- a) Bone destruction caused by the extension of gingival inflammation
- b) Bone destruction caused by trauma from occlusion
- c) Bone destruction caused by systemic disorders
- d) Factors determining bone morphology in periodontal disease
- e) Bone destruction patterns in periodontal disease

24 **Masticatory system disorders.**

- a) Temporomandibular joint
- b) Muscles and nerves of the masticatory system
- c) Centric relation
- d) Biomechanics of the masticatory system
- e) Dysfunction and deterioration
- f) Orofacial pain
- g) Comprehensive evaluation
- h) Diagnostic decision making

25 **Chronic periodontitis.**

- a) Clinical features
- b) Risk factors for disease
- c) Pathogenesis

26 **Aggressive periodontitis.**

- a) Overview
- b) Historical background
- c) Classification and clinical characteristics
- d) Epidemiology
- e) Pathobiology and risk factors
- f) Therapeutic considerations in aggressive periodontitis patients

27 **Necrotising ulcerative periodontitis.**

- a) Clinical features
- b) Microscopic findings
- c) Patients with HIV/AIDS
- d) Etiology of necrotizing ulcerative periodontitis
- e) Malnutrition

28 **Clinical diagnosis.**

- a) Overall appraisal of the patient
- b) Health history, dental history, photographic documentation
- c) Clinical examination
- d) Tactile periodontal examination
- e) Periodontal charting
- f) Examination of the teeth and implants
- g) Radiographic examination
- h) Laboratory aids to clinical diagnosis

- i) Periodontaldiagnosis
- j) Assessment of biofilm control and patienteducation

29        **Radiographic and other aids in the diagnosis of periodontaldiseases.**

- a) Normal interdentalbone
- b) Radiographictechniques
- c) Bone destruction in periodontal disease
- d) Radiographic appearance of periodontaldisease
- e) Digital intraoralradiography
- f) Advanced diagnostictechniques

30        **Interdisciplinaryapproaches.**

a) **Orthodonticconsiderations**

- Benefits of orthodontitherapy
- Pre-orthodontic osseoussurgery
- Orthodontic treatment of osseousdefects
- Orthodontic treatment of gingivaldiscrepancies
- Implant interactions inorthodontics

b) **Endodonticconsiderations**

- Factors initiating pulpal and apicaldiseases
- Classification of pulpal and apicaldiseases
- Biologic effects of pulpal infection on periodontaltissues
- Biologic effects of periodontal infection on the dentalpulp
- Effects of endodontic pathosis on development of retrogradeperi-implantitis
- Interactions between extra-radicular infection and theperiodontium
- Differential diagnosis of pulpal and periodontalinfection

31        **Riskassessment.**

- a. Definitions
- b. Risk factors for periodontaldisease
- c. Risk determinants/background characteristics for periodontaldisease
- d. Risk indicators for periodontaldiseases
- e. Risk markers/predictors for periodontaldisease
- f. Clinical risk assessment for periodontaldisease

- 32 **Determination of prognosis.**
- a. Definitions
  - b. Types of prognosis
  - c. Factors in determination of prognosis
  - d. Prognosis of specific periodontal diseases
  - e. Determination and reassessment of prognosis
  - f. Relationship between diagnosis & prognosis
- 33 **Treatment plan.**
- a. Overall treatment plan
  - b. Sequence of therapy
  - c. Explaining the treatment plan to the patient
- 34 **Rationale for periodontal treatment.**
- a. Factors that affect healing
  - b. Healing after periodontal therapy
  - c. Periodontal reconstruction
- 35 **Levels of clinical significance.**
- a. Tangible versus intangible benefits
  - b. Size of treatment effect
  - c. Defining four levels of clinical significance
- 36 **General principles of anti-infective therapy with special emphasis on infection control in periodontal practice.**
- a. Definitions
  - b. Systemic administration of antibiotics
  - c. Serial and combination antibiotic therapy
  - d. Local delivery agents
  - e. Local delivery of antimicrobial agents & peri-implant mucositis/implantitis
- 37 **Oral malodor.**
- a. Semantics and classification
  - b. Epidemiology
  - c. Etiology
  - d. Fundamentals of malodor detection
  - e. Diagnosis of malodor
  - f. Treatment of oral malodor
- 38 **Bruxism and its treatment**

39 **Periodontal instrumentation.**

- a. Classification of periodontal instruments
- b. Principles of periodontal instrumentation
- c. Principles of scaling & root planing
- d. Sharpening of periodontal instruments.

40 **Plaque control.**

- a. The toothbrush
- b. Powered toothbrushes
- c. Dentifrices
- c) Tooth brushing methods
- d) Interdental cleaning aids
- e) Gingival massage
- f) Oral irrigation devices
- g) Caries control
- h) Chemical plaque biofilm control with oral rinses
- i) Disclosing agents
- j) Frequency of plaque biofilm removal
- k) Patient motivation and education

41 **Periodontal management of HIV infected patients.**

- a. Periodontal treatment protocol
- b. Oral candidiasis
- d) Oral hairy leukoplakia
- e) Kaposi's sarcoma
- f) Bacillary angiomatosis
- g) Non-specific oral ulcerations and recurrent aphthae
- h) Periodontal disease in HIV positive individual

42 **Occlusal evaluation and therapy in the management of periodontal disease.**

- a) Terminology
- b) Occlusal function and dysfunction
- c) Biologic basis of occlusal function
- d) Pathogenesis
- e) Parafunction
- f) Clinical evaluation procedures
- g) Interpretation & treatment planning
- h) Occlusal therapy

43 **Role of orthodontics as an adjunct to periodontal therapy.**

- a) Benefits of orthodontic therapy
  - b) Pre-orthodontic osseous surgery
  - c) Orthodontic treatment of osseous defects
  - d) Orthodontic treatment of gingival discrepancies
  - e) Implant interactions in orthodontics
- 44 **Special emphasis on precautions and treatment for medically compromised patients.**
- 45 **Periodontal splints.**
- 46 **Dentinal hypersensitivity.**
- 47 **Periodontal surgical phase.**
- a) General principles of periodontal surgery
  - b) Outpatient surgery
  - c) Hospital periodontal surgery
  - d) Surgical instruments
- 48 **Surgical anatomy of periodontium and related structures.**
- a) Mandible
  - b) Maxilla
  - c) Exostoses
  - d) Muscles
  - e) Anatomic spaces
- 49 **Gingival curettage.**
- a) Rationale
  - b) Indications
  - c) Procedure
  - d) Healing after scaling and curettage
  - e) Clinical appearance after scaling and curettage
- 50 **Gingivectomy technique.**
- a) Indications & contraindications
  - b) Surgical gingivectomy
  - c) Healing after surgical gingivectomy
  - d) Gingivectomy by electrosurgery
  - e) Healing after gingivectomy by electrosurgery
  - f) Laser gingivectomy
  - g) Gingivectomy by chemosurgery
- 51 **Treatment of gingival enlargements.**
- a) Treatment of chronic inflammatory enlargement

- b) Treatment of periodontal and gingival abscesses
  - c) Treatment of drug associated gingival enlargement
  - d) Treatment of leukemic gingival enlargement
  - e) Treatment of gingival enlargement in pregnancy
  - f) Treatment of gingival enlargement in puberty
  - g) Recurrence of gingival enlargement
- 52 **Periodontal flap.**
- a) Classification of flaps
  - b) Design of the flap
  - c) Incisions
  - d) Elevation of the flap
  - e) Suturing techniques
  - f) Healing after flap surgery
- 53 **Flap technique for pocket therapy.**
- a) Modified Widman Flap
  - b) Undisplaced flap
  - c) Apically displaced flap
  - d) Flaps for reconstructive surgeries
  - e) Distal molar surgeries
- 54 **Osseous surgery (Resective and Regenerative).**
- a) Resective**
- Selection of treatment technique
  - Rationale
  - Normal alveolar bone morphology
  - Terminology
  - Factors in selection of resective osseous surgery
  - Examination and treatment planning
  - Methods of resective osseous surgery
  - Osseous resection technique
  - Flap placement and closure
  - Postoperative maintenance
  - Specific osseous reshaping situations
- b) Regenerative**
- Assessment of new attachment & periodontal reconstruction
  - Reconstructive surgical techniques

- Factors that influence therapeuticsuccess
- Future directions for periodontalregeneration

55 **Furcation: Involvement & treatment.**

- Etiologicfactors
- Diagnosis and classification of furcationdefects
- Local anatomicfactors
- Anatomy of the bonylesions
- Indices of furcationinvolvement
- Treatment
- Nonsurgicaltherapy
- Surgicaltherapy
- Prognosis

56 **Periodontic plastic and estheticsurgery.**

- Terminology
- Objectives
- Cause of marginal tissurerecession
- Factors that affect surgicaloutcome
- Techniques to increase attachedgingiva
- Techniques to deepen thevestibule
- Techniques to remove thefrenum
- Techniques to improveaesthetics
- Tissue engineering
- Criteria for selection oftechniques

57 **Host modulation.**

- Systemically administeredagents
- Locally administeredagents
- Host modulation & comprehensive periodontal management
- Sub-antimicrobial doseDoxycycline
- Emerging host modulatorytherapies
- Host modulation factors in systemicdisorders

58 **The periodontic- endodonticcontinuum.**

- Rationale fortherapy
- Sequence oftreatment
- Control of activedisease
- Preprostheticsurgery
- Biologicconsiderations
- Esthetic tissue management
- Occlusal considerations in restorativetherapy

h) Special restorative considerations

59 **Periodontal microsurgery.**

- a) Philosophy of periodontal microsurgery
- b) Advantages of microsurgery
- c) Magnification systems
- d) Microsurgical sutures
- e) Esthetic periodontal microsurgery
- f) Microsurgical knots

60 **Lasers in periodontal and peri-implant therapy.**

- a) Laser physics and biologic interactions
- b) Laser applications in periodontics
- c) Lasers in the management of periodontitis
- d) Lasers in the management of peri-implantitis
- e) Complications and risks of laser therapy

61 **Leukocyte- and platelet-rich fibrin.**

- a) Introduction
- b) General characteristics of L-PRF membranes
- c) Extraoral applications of L-PRF
- d) L-PRF in the treatment of periodontal bony defects
- e) L-PRF for ridge preservation
- f) L-PRF and sinus floor elevation
- g) L-PRF and implant surgery
- h) L-PRF for periodontal mucogingival surgery
- i) L-PRF and medication-related osteonecrosis of the jawbone
- j) Initial observations on the PRF-block

62 **Periodontal maintenance phase.**

**a) Supportive periodontal treatment**

- Rationale for supportive periodontal treatment
- Maintenance program
- Classification of post treatment patients and risk assessment
- Referral of patients to the periodontist
- Tests for disease activity
- Maintenance for dental implant patient

**a) Results of periodontal treatment**

- Prevention and treatment of gingivitis
- Prevention and treatment of loss of attachment
- Tooth mortality

63 **Future directions and controversial questions in periodontal therapy.**

- Future directions for infection control
- Research directions in regenerative therapy
- Future directions in anti-inflammatory therapy
- Future directions in measurement of periodontal diseases

64 **Oral implantology.**

- Introduction and historical review
- Biological, clinical and surgical aspects of dental implants
- Biomaterials
- Peri-implant anatomy, biology, and function
- Implant geometry (macrodesign)
- Implant surface characteristics (microdesign)
- Hard tissue interface
- Soft tissue interface
- Clinical comparison of teeth and implants
- Clinical evaluation of the implant patient
- Case types and indications
- Pretreatment evaluation
- Risk factors and contraindications
- Post treatment evaluation
- Diagnosis and treatment planning
- Standard projections
- Cross-sectional imaging
- Interactive "simulation" software programs
- Patient evaluation
- Clinical selection of diagnostic imaging

65 **Implant surgery.**

- Basic implant surgical procedures**
  - General principles of implant surgery
  - Two-stage "submerged" implant placement
  - One-stage "non-submerged" implant placement

**b) Localized bone augmentation and implant site development**

- Guided bone regeneration
- Localized ridge augmentation
- Alveolar ridge preservation/management of extractions

**c) Advanced implant surgical procedures**

- Maxillary sinus elevation and bone augmentation
- Supracrestal/vertical bone augmentation
- Growth factors in bone augmentation

**d) Esthetic management of difficult cases (minimally invasive approach)**

- Surgical strategy for predictable aesthetics
- Immediate implant placement for predictability and aesthetics
- Surgical management of difficult cases (minimally invasive approach)

**e) Dental implant microsurgery**

**f) Piezoelectric bone surgery**

- Clinical characteristics of ultrasonic cutting
- Clinical applications & advanced clinical applications
- Digitally assisted implant surgery

**66 Prosthetic aspects of dental implants.**

- a) Impression making techniques
- b) Implant considerations
- c) Abutment/prosthesis considerations for single units
- d) Management of partially edentulous implant treatment in the aesthetic zone
- e) Fully edentulous: prosthetic considerations

**67 Implant-related complications and failures.**

- Definitions of implant survival and success
- Types and prevalence of implant complications
- Types of dental implants
- Surgical complications
- Biologic complications
- Complications related to augmentation procedures
- Complications related to placement and loading protocols

- Prosthetic or mechanical complications
- Aesthetic and phonetic complications

68 **Diagnosis and treatment of peri-implant complications.**

- Incidence
- Etiology
- Technical implant failures
- Diagnosis of peri-implant tissue breakdown
- Removal of failed implants
- Initial phase of peri-implantitis treatment
- Surgical techniques for treatment of peri-implantitis
- Maintenance
- Special emphasis on plaque control measures in implant patients
- Maintenance phase.

69 **Management of medical emergencies in periodontal practice.**

70 **Evidence based decision making in clinical practice.**

## Scheme of Examination

### **A) Theory**

Part – I	Basic sciences paper	100 Marks
Part – II	Paper –I Paper-II, Paper-III	300 Marks (100 Marks for each paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of **MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration. Paper-I , Paper-II and Paper III shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Distribution of topics for each paper will be as follows:**

Part- I: Applied Basic Sciences: Applied Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.

Part-II

Paper I: Normal Periodontal structure, Etiology & Pathogenesis of Periodontal diseases, epidemiology as related to Periodontics

Part-II Paper II: Periodontal diagnosis, therapy & Oral Implantology Paper III: Essays (descriptive and analyzing type questions)

\*The topics assigned to the different papers are generally evaluated under those sections. However, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

### **B) Practical / Clinical Examination:**

**200 Marks**

The clinical examination shall be of two days duration

#### **1st day**

Case Discussion

- Long Case- One
- Short case –One
- Periodontal surgery – Periodontal Surgery on a previously prepared case after getting approval from the Examiners

#### **2nd day**

Post-surgical review and discussion of the case treated on the 1st day Presentation of dissertation & discussion

All the examiners shall participate in all the aspects of clinical examinations / Viva Voce Distribution of Marks for Clinical examination (recommended)

a) Long Case discussion	75 marks	
b) I short case	25 marks	
c) Periodontal surgery	1. Anesthesia	10
	2. Incision	20
	3. Post Surgery Evaluation	25
	4. Sutures	10
	5. Pick up (if any)	10
Post – operative review		25

**Total**

**200**

### **C. Viva Voce:**

**100 Marks**

#### **i. Viva-Voce examination: 80 marks**

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach,

expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

**ii. Pedagogy Exercise: 20 marks**

A topic will be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.











# **SYLLABUS OF PART – I**

## **SUBJECT : PROSTHODONTICS AND CROWN & BRIDGE**

### **Applied Anatomy**

- Anatomy of the stomatognathic system. - Maxilla, Mandible, Maxillary sinus, Face ( muscles & nerve supply) , Trigeminal ganglion, Cranial nerves, Salivary glands, Larynx, Pharynx, Trachea and esophagus, Muscles of mastication, Maxillary artery, Temporomandibular Joint, Mandibular Nerve, sympathetic & parasympathetic ganglion,
- Anatomy of T.M.J. its movements, disorders and its management.
- Anatomy physiology and function of the masticator system.

### **Embryology**

- Derivatives of Neural Crest, Pharyngeal arches

### **Growth & Development Genetics**

- Growth and development of face jaws and teeth.
- Growth and development of Maxilla, Mandible ,Face, Hard Palate, Soft Palate, Tongue
- Consequences and management of age changes in the dentition
- Principles of orofacial genetics
- molecular basis of genetic defects

### **Immunology**

- Basic principles of immunity, antigen and antibody reactions
- Immunological disorders,
- Sensitivity, Delayed Hypersensitivity
- Cell mediated immunity

### **Physiology**

- Mastication, swallowing, Speech and deglutition mechanism.
- Salivary glands and saliva,
- Healing of wound & Fracture
- Blood: Composition , volume , functions , blood groups , RBC and haemoglobin , WBC: Structure and Functions , Platelets : Function and applied aspects and Plasma Proteins

- Physiology of pain , sympathetic and para-sympathetic nervous systems , physiology of pulpal pain and non odontogenic pain , pain disorders-typical and atypical

### **Nutrition & Biochemistry**

- Role of Vitamin A, C and B complex in oral mucosal and periodontal health.
- Role of Calcium and Vitamin D in growth and development of teeth and jaws.
- Balanced diet
- Nutrition in geriatric patients

### **Pathology & Microbiology**

- Pathology of the periodontal, Pulp and peri-apical tissues
- Pathology of dental tissues and oral cavity.
- Dental plaque in relation to dental disease.
- Sensory perception and pain
- Oral pre-cancerous lesions.
- Malignant lesions of the oral cavity and head and neck region.
- Developmental anomalies of face, jaws and teeth
- Microbiological & virological effects & its treatment options.
- Biomedical waste disposal system
- Sterilization & Disinfection
- Staphylococci, Streptococci, Fungi- Candida ,Tuberculosis
- Blood Coagulation with applied aspects , Blood Transfusion , shock, lymph and applied aspects , Inflammation , Repair and regeneration , necrosis and Gangrene , Neoplasm , classification of tumors and carcinogenesis.

### **Virology**

- Microbiological & virological effects & its treatment options.
- HIV, Hepatitis, Herpes Virus

### **Applied Pharmacology**

- Medical conditions and medications affecting dental treatment in Geriatric patients
- Antihypertensive
- NSAIDS

- Anti-Histaminics
- Anti-cholinergic
- Adrenergic drugs
- Antibiotics
- Antacids
- Anticoagulants
- Dosage and mode of administration of drugs
- Brief Pharmacology of : drugs acting on Central Nervous System, general anesthetics ,hypnotics, analeptics and tranquilizers, Local anesthetics, antibiotics, analgesics and antipyretics, antiseptics, styptics , Sialogogues and anti-sialogogues, Haematinics , Cortisone , ACTH , Insulin and other ant diabetic
- Chemotherapy and Radiotherapy

### **Applied Dental Materials:**

- Physical, mechanical and biological properties of modern dental materials.
- Gypsum products used in prosthodontics.
- Die and counter die materials.
- Various resins used in prosthodontics including Denture base materials
- Impression materials used in Dentistry.
- Duplicating materials.
- Metals and alloys used in Dentistry.
- Dental Waxes including inlay casting wax
- Investments.
- Casting machines procedures and defects.
- Soldering and Welding
- Cements - restorative and luting
- Composites - various generations and system in order of development.

Composition, uses and manipulation.

- Tissue conditioner and soft relines.
- Porcelain Including Porcelain fused to Metal alloys.

- Porcelain furnace, firing and techniques.
- Mechanics of tooth cutting (burs and points)
- Cutting, polishing and finishing agents.
- Implant materials.
- Bonding agents – enamel and dentin bonding agents and various other adhesives.
- CAD-CAM System & material science & digital scanning systems

### **Research Methodology and Biostatistics**

- Scope and need for statistical application to biological data.
- Definition of selected terms- scale of measurements related to statistics.
- Methods of collecting data.
- Presentation of data statistical diagrams and graphs

### **Applied Dental Anatomy and Histology**

- Biology and anatomy of dental tissues
- Biology and physiology enamel, dentine Cementum, pulp and periodontium
- Anatomy and histology of oral mucous membrane.
- Anatomy of T.M.J. its movements, disorders and its management.
- Anatomy physiology and function of the masticator system.
- Normal occlusion, development of occlusion in deciduous, mixed and permanent
- Dentitions.

### **Oral Pathology & Oral Microbiology**

- Pathology of the periodontal, Pulp and peri-apical tissues
- Pathology of dental tissues and oral cavity.
- Dental plaque in relation to dental disease.
- Sensory perception and pain
- Oral pre-cancerous lesions.

- Malignant lesions of the oral cavity and head and neck region.
- Developmental anomalies of face, jaws and teeth
- Microbiological & virological effects & its treatment options.
- Regressive changes of teeth
- Bacterial ,viral and mycotic infections of oral cavity
- Dental caries
- Physical and chemical injuries of the oral cavity
- Oral manifestations of metabolic and endocrinal disturbances
- Diseases of blood and blood forming organisms in relation to oral cavity
- Diseases of skin, nerves and muscles in relation to oral cavity
- Anatomy of TMJ, its movements , disorders and its management

# **PROSTHODONTICS AND CROWN & BRIDGE**

## **1. NON-SURGICAL AND SURGICAL METHODS OF PROSTHODONTICS AND IMPLANTOLOGY**

### **A) Complete Denture Prosthesis**

- 1 Definitions
- 2 Terminologies, G.P.T., Boucher's clinical dental terminology
- 3 The Cranio Mandibular system and its functions,
- 4 Reasons for loss of teeth,
- 5 Consequences of loss of teeth
- 6 Treatment modality with various restorations and replacements
- 7 **Edentulous Predicament,**
  - i Biomechanics of the edentulous state,
  - ii Support mechanism for the natural dentition and complete dentures,
  - iii Biological considerations,
  - iv Functional and Para functional considerations,
  - v Esthetic, behavioral and adaptive responses,
  - vi Temporomandibular joint changes.
- 8 **Effects of aging of edentulous patients**
  - i. Aging population distribution of edentulism in old age
  - ii. Impact of age on edentulous mouth – Mucosa, Bone, saliva, jaw movements in old age, taste and smell, nutrition, aging, skin and teeth, concern for personal appearance in old age
- 9 **Sequelae caused by wearing complete denture**
  - i. Mucosal reactions,
  - ii. Altered taste perception,
  - iii Burning mouth syndrome,
  - iv Gagging,
  - v. Residual ridge (reduction) resorption,
  - vi. Denture stomatitis,
  - vii Flabby ridge,
  - viii Denture irritation hyperplasia,
  - ix Traumatic Ulcers,
  - x Oral cancer in denture wearers,
  - xi Nutritional deficiencies,
  - xii Masticatory ability and performance,
  - xiii Nutritional status and

xiv Masticatory functions.

**10 Temporomandibular disorders in edentulous patients –**

- i. Epidemiology,
- ii Etiology and
- iii Management,
- iv Pharmacotherapy,
- v Physical and Bio-behavioral modalities

**11 Nutrition Care for the denture wearing patient –**

- i. Impact of dental status on food intake
- ii. Gastrointestinal functions
- iii. Nutritional needs and status of older adults
- iv. Calcium and bone health
- v. Vitamin and herbal supplementation
- vi. Dietary counseling
- vii. Risk factor for malnutrition in patients with dentures
- viii. When teeth are extracted

**12 Preparing patient for complete denture patients –**

- i. Diagnosis and treatment planning for edentulous and partially edentulous patients
  - Familiarity with patients
  - Principles of perception
  - Health questionnaires
  - Identification data
  - Problem identification
  - Prognosis and treatment identification data
  - Problem identification,
- ii Prognosis and treatment planning
  - Contributing history
  - Patient's history
  - Social information
  - Medical status
  - Systemic status with special reference to debilitating diseases
  - Diseases of the joints
  - Cardiovascular disorders
  - Diseases of the skin
  - Neurological disorders
  - Oral malignancies

- Climacteric
  - Use of drugs
  - Mental attitude
  - Psychological changes
  - Adaptability
  - Geriatric changes
  - Intra oral changes
  - Intra oral health (mucus membrane, alveolar ridges, palate and vestibular sulcus and dental health)
- 13 Data collection and recording (visual observation, radiography, palpation, measurement of sulci or fossae, extra oral measurement, the vertical dimension of occlusion, diagnostic casts).
- 14 Specific observations
- i. Existing dentures
  - ii. Soft tissue health
  - iii. Hard tissue health – teeth, bone
- 15 Biomechanical considerations
- i. Jaw relations
  - ii. Border tissues
  - iii. Saliva
  - iv. Muscular development (muscle tone, neuromuscular co-ordination, tongue, cheek and lips).
- 16 Interpreting diagnostic findings and treatment planning
- 17 Immediate Denture
- a) Advantages
  - b) Disadvantages
  - c) Contraindications
  - d) Diagnosis, treatment planning
  - e) Prognosis
  - f) Explanation to the patient
  - g) Oral examinations
  - h) Examination of existing prosthesis
  - i) Tooth modification
  - j) Prognosis
  - k) Referrals/adjunctive care
  - l) Oral prophylaxis and other treatment needs.
- 18 First visit-

- a) Preliminary impressions and diagnostic casts,
- b) Management of loose teeth
- c) Custom trays
- d) Final impressions and master casts
- e) Two tray or sectional custom impression tray
- f) Location of posterior limit and jaw relation records
- g) Setting of the posterior denture teeth / verifying jaw relations and the patient try in.

19 Laboratory phase

- a) Setting of anterior teeth
- b) Wax contouring
- c) Flasking and boil out
- d) Processing and finishing

20 Surgical templates

- a) Surgery and immediate denture insertion
- b) Post operative care and patient instructions, subsequent service for the patient on the immediate denture.

21 Over dentures (tooth supported complete dentures)

- a) Indications and treatment planning
- b) Advantages and disadvantages
- c) Selection of abutment teeth
- d) Loss of abutment teeth
- e) Tooth supported complete dentures
- f) Non-coping abutments
- g) Abutment with copings
- h) Abutments with attachments
- i) Submerged vital roots
- j) Preparations of the retainedteeth.

22 Single Dentures:

- a) Single Mandibular denture to oppose natural maxillary teeth,
- b) Single complete maxillary denture to oppose natural Mandibular teeth to oppose a partially edentulous Mandibular arch with fixed prosthesis
- c) Partially edentulous Mandibular arch with removable partial dentures
- d) Opposing existing complete dentures
- e) Preservation of the residual alveolar ridge, necessity for retaining maxillary teeth and preventing mentaltrauma.

- 23 Pre prosthetic surgery
- 24 Non surgical methods
  - i. Rest for the denture supporting tissues
  - ii. Occlusal correction of the old prosthesis
  - iii. Good nutrition
  - iv. Conditioning of the patients musculature

A **Surgical methods –**

- Correction of conditions, that preclude optimal prosthetic function
  - i. Hyperplastic ridge
  - ii. Epulis fissuratum
  - iii. Papillomatosis
  - iv. Frenular attachments
  - v. Pendulous maxillary tuberosities
  - vi. Ridge augmentation
  - vii. Maxillary and mandibular oral implants
  - viii. Corrections of congenital deformities
  - ix. Discrepancies in jaw size
  - x. Relief of pressure on the mental foramen
  - xi. Enlargement of denture bearing areas
  - xii. Vestibuloplasty
  - xiii. Ridge augmentation
  - xiv. Replacement of tooth roots with Osseo integrated denture implants.
- **Implant supported Prosthesis for partially edentulous patients** –Science of Osseo integration, clinical protocol (**diagnostic, surgical and prosthetic**) for treatment with implant supported over dentures, managing problems and complications. Implant Prosthodontics for edentulous patients: current and future directions.  
 Implant supported prosthesis for partially edentulous patients – Clinical and laboratory protocol: Implant supported prosthesis, managing problems and complications
  - i. Introduction and Historical Review
  - ii. Biological, clinical and surgical aspects of oral implants o Diagnosis and treatment planning
  - iii. Radiological interpretation for selection of fixtures
  - iv. Splints for guidance fort surgical placement of fixtures.

- v. Surgical and Intra oral plastic surgery, if any Guided bone and Tissue regeneration consideration for implants fixture.
- vi. Implant supported prosthesis for complete edentulism and partial edentulism o Occlusion for implant supported prosthesis.
- vii. Peri-implant tissue and Management of peri-implantitis
- viii. Maintenance and after care.
- ix. Management of failed restoration.
- x. Work authorization for implant supported prosthesis – definitive instructions, legal aspects, delineation of responsibility.

**25 Art of communication in the management of the edentulous predicament**

- i. Communication–scope
- ii. A model of communication, why communication is important? What are the elements of effective communication? Special significance of doctor / patient communication
- iii. Doctor behavior
- iv. The iatro sedative (doctor & act of making calm) recognizing and acknowledging the problem
- v. Exploring and identifying the problem
- vi. Interpreting and explaining the problem
- vii. Offering a solution to the problem for mobilizing their resources to operate in a most efficient way
- viii. Recognizing and acknowledging the problem
- ix. Interpreting and explaining the problem
- x. Offering a solution to the problem.

**26 Materials prescribed in the management of edentulous patients –**

- i. Denture base materials
- ii. General requirements of biomaterials for edentulous patients
- iii. Requirement of an ideal denture base
- iv. Chemical composition of denture base resins
- v. Materials used in the fabrication of prosthetic denture teeth
- vi. Requirement of prosthetic denture teeth
- vii. Denture lining materials and tissue conditioners
- viii.** Cast metal alloys as denture bases – base metal alloys.

**27 Articulators – Evolution of concepts**

- i. Classification
- ii. Selection
- iii. Limitations
- iv. Precision

- v. Accuracy and sensitivity
- vi. Functions of the articulator and their uses
- vii. Recent advancements including virtual articulator

**28 Fabrication of complete dentures**

- i. Complete denture impressions—muscles of facial expressions and anatomical landmarks, support, retention, stability, aims and objectives of preservation, support, stability, aesthetics, and retention.
- ii. Impression materials and techniques – need of 2 impressions the preliminary impression and final impressions. Preliminary and final impressions, impression making, custom tray and refining the custom tray, preparing the tray to secure the final impression, making the final impression, boxing impression and making the casts
- iii. Developing an analogue / substitute for the maxillary denture bearing area – anatomy of supporting structures – mucous membrane, hard palate, residual ridge, shape of the supporting structure and factors that influence the form and size of the supporting bones, incisive foramen, maxillary tuberosity, sharp spiny process, torus palatinus,
- iv. Anatomy of peripheral or limiting structures, labial vestibule, Buccal vestibule, vibrating lines.
- v. Developing an analogue / substitute for the Mandibular denture bearing area- anatomy of supporting structure, crest of the residual ridge, buccal shelf, shape of Supporting structure, mylohyoid ridge, mental foramen, genial tubercles, torus mandibularis, Anatomy of peripheral or limiting structure – labial vestibule, Buccal vestibule, lingual border, mylohyoid muscle, retromylohyoid fossa, sublingual gland region, alveolingual sulcus, Mandibular impressions – preliminary impressions, custom tray, refining, preparing the tray\, final impressions.

**29 Mandibular movements, Maxillo mandibular relations and concepts of occlusion**

- i. Gnathology,
- ii. Identification of shape and location of arch form—Mandibular and maxillary occlusion rims, level of occlusal plane and recording of trail denture base, tests to determine vertical dimension of occlusion, interocclusal & centric relation records.
- iii. Biological and clinical considerations in making jaw relation records and transferring records from the patients to the articulator
- iv. Recording of Mandibular movements – influence of opposing tooth contacts, temporomandibular joint, muscular involvements, neuromuscular

- regulation of Mandibular motion, the envelope of motion, rest position.
- v. Maxillo – Mandibular relations – the centric, eccentric, physiologic rest position, vertical dimension, occlusion,
  - vi. Recording methods – mechanical, physiological,
  - vii. Determining the horizontal jaw relation – Functional graphics, tactile or interocclusal check record method, Orientation / sagittal relation records, Arbitrary / Hinge axis and face bow record, significance and requirement, principles and biological considerations and securing on articulators.
- 30 **Selecting and arranging artificial teeth and occlusion for the edentulous patient** –
- i. Anterior tooth selection, posterior tooth selection, and principles in arrangement of teeth, and factors governing the position of teeth – horizontal & vertical relations.
  - ii. The inclinations and arrangement of teeth for aesthetics, phonetics and mechanics – to concept of occlusion.
- 31 **The Try in** –
- i. Verifying vertical dimension
  - ii. Centric relation
  - iii. Establishment of posterior palatal seal
  - iv. Creating a facial and functional harmony with anterior teeth
  - v. Harmony of spaces of individual teeth position
  - vi. Harmony with sex
  - vii. Personality and age of the patient
  - viii. Co-relating aesthetics and incisal guidance.
- 32 **Speech considerations with complete dentures & speech production** –
- i. Structural and functional demands,
  - ii. Neuropsychological background,
  - iii. Speech production and the roll of teeth and other oral structures
    - Bilabial sounds labiodental(s) sounds
    - Linguodental sounds
    - Linguoalveolar sound
    - Articulatoric characteristics
    - Acoustic characteristics
    - Auditory characteristics
    - Linguopalatal and linguoalveolar sounds
    - Speech analysis and prosthetic considerations.
- 33 **Waxing contouring and processing the dentures their fit and insertion and after care** –
- i. Laboratory procedure–

- Wax contouring
- Flasking and processing
- Laboratory remount procedures
- Selective grinding
- Finishing and polishing.
- ii. Critiquing the finished prosthesis –
  - Doctors evaluation
  - Patients evaluation
  - Friends evaluation
  - Elimination of basal surface errors
  - Errors in occlusion
  - Interocclusal records for remounting procedures – verifying centric relation, eliminating occlusal errors.
- iii. Special instructions to the patient – appearance with new denture, mastication with new dentures, speaking with new dentures, oral hygiene with dentures, preservation of residual ridges and educational material for patients, maintaining the comfort and health of the oral cavity in the rehabilitated edentulous patients. Twenty-four hours oral examination and treatment and (preventive) Prosthodontic
  - periodontic recall for oral examination 3 to 4 months intervals and yearly intervals.

## **B Prosthodontic treatment for partially edentulous patients – Removable partial Prosthodontics**

### **Scope, definition and terminology**

- Classification of partially edentulous arches - requirements of an acceptable method of classification,
- Kennedy's classification
- Applegate's rules for applying the Kennedy classification

### **Components of RPD–**

- i) **Major connector**–mandibular and maxillary
- ii) **Minor connectors**- design
  - Functions & form and location of major and minor connectors
  - Tissue stops
  - Finishing lines
  - Reaction of tissue to metallic coverage
- iii) **Rest and rest seats** – form of the Occlusal rest and rest seat,
  - Interproximal Occlusal rest seats

- Internal Occlusal rests
- Possible movements of partial dentures
- Support for rests
- Lingual rests on canines and incisor teeth
- Incisal rest and restseat.

iv) **Direct retainers**- Internal attachments & extracoronal direct retainers.

- Relative uniformity of retention
- Flexibility of clasp arms
- Stabilizing reciprocal clasp
- Criteria for selecting a given clasp design
- The basic principles of clasp design
- Circumferential clasp, bar clasp, combination clasp and other type of retainers.

v) **Indirect Retainers** – denture rotation about an axis,

- Factors influencing effectiveness of indirect retainers
- Forms of indirect retainers
- Auxiliary Occlusal rest
- Canine extensions from Occlusal rests, canine rests
- Continuous bar retainers and linguoplates
- Modification areas, rugae support, direct – indirect retention

vi) **Teeth and denture bases** – types,

- Materials,
- Advantages and dis-advantages,
- Indications and contraindications and clinical use.

vii) **Principles of removable partial Denture design** –

- Bio mechanical considerations,
- The factors influencing after mouth preparations
- Occlusal relationship of remaining teeth
- Orientation of Occlusal plane
- Available space for restoration
- Arch integrity
- Tooth morphology
- Response of oral structure to previous stress
- Periodontal conditions
- Abutment support
- Tooth supported and tooth and tissue supported,

- Need for indirect retention
- Clasp design
- Need for rebasing
- Secondary impression
- Need for abutment tooth modification
- Type of major connector
- Type of teeth selection
- Patients past experience
- Method of replacing single teeth or missing anterior teeth.
- Difference between tooth supported and tissue supported partial dentures, essentials of partial denture design
- Components of partial denture design,
- Tooth support
- Tissue support
- Stabilizing components
- Guiding planes
- Use of splint bar for denture support
- Internal clip attachments
- Overlay abutment as support for a denture base
- Use of a component partially to gain support.

**a. Education of patient**

**b. Diagnosis and treatment planning**

**c. Design, treatment sequencing and mouth preparation**

**d. Surveying –**

- Description of dental surveyor
- Purposes of surveying
- Aims and objectives in surveying of diagnostic cast and master cast
- Final path of insertion
- Factors that determine path of insertion and removal
- Recording relation of cast to surveyor
- Measuring amount of retentive area
- Blocking of master cast – paralleled blockout, shaped blockout, arbitrary blockout and relief.

**e. Diagnosis and treatment planning –**

- Infection control and cross infection barriers –
- Clinical and laboratory and hospital waste management
- Objectives of prosthodontic treatment

- Records
- Systemic evaluation
- Oral examination, preparation of diagnostic cast
- Interpretation of examination data
- Radiographic interpretation
- Periodontal considerations
- Caries activity
- Prospective surgical preparation
- Endodontic treatment
- Analysis of occlusal factors
- Fixed restorations
- Orthodontic treatment
- Need for determining the design of components
- Impression procedures and occlusion
- Need for reshaping remaining teeth
- Reduction of unfavorable tooth contours
- Differential diagnosis: fixed or removable partial dentures
- Choice between complete denture and removable partial dentures, choice of materials

**f. Preparation of Mouth for removable partial dentures** –Oral surgical preparation

- Conditioning of abused and irritated tissues
- Periodontal preparation – objectives of periodontal therapy
- Periodontal diagnosis
- Control therapy
- Periodontal surgery.

**g. Preparation of Abutment teeth** –Classification of abutment teeth

- Sequence of abutment preparations on sound enamel or existing restorations
- Conservative restorations using crowns
- Splinting abutment teeth
- Utilization
- Temporary crowns to be used as abutment.

**h. Impression Materials and Procedures for Removable Partial Dentures** –

- Rigid materials
- Thermoplastic materials

- Elastic materials
- Impressions of the partially edentulous arch
- Tooth supported; tooth tissue supported
- Individual impressiontrays

**i. Support for the Distal Extension Denture Base –Distal extension**

- Removable partial denture
- Factors influencing the support of distal extension base
- Methods of obtaining functional support for the distal extensionbase.

**j. Laboratory Procedures –Duplicating a stone cast**

- Waxing the partial denture framework
- Anatomic replica patterns
- Spruing
- Investing
- Burnout
- Casting and finishing of the partial denture framework
- Making record bases
- Occlusion rims
- Making a stone occlusal template from a functional occlusal record
- Arranging posterior teeth to an opposing cast or template
- Arrangement of anterior teeth
- Waxing and investing the partial denture before processing acrylic resin bases
- Processing the denture
- Remounting and occlusal correction to an occlusal template
- Polishing the denture.

**k. Initial placement, adjustment and servicing of the removable partial denture**

- Adjustments to bearing surfaces of denture framework
- Adjustment of occlusion in harmony with natural and artificial dentition
- Instructions to the patient
- Follow – up services

**l. Relining and Rebasing the removable partial denture –Relining tooth supported dentures bases**

- Relining distal extension denture bases
- Methods of reestablishing occlusion on a relined partialdenture.

**m. Repairs and additions to removable partial dentures –Broken clasp arms**

- Fractured occlusal rests

- Distortion or breakage of other components – major and minor connectors
- Loss of a tooth or teeth not involved in the support or retention of the restoration
- Loss of an abutment tooth necessitating its replacement and making a new direct retainer
- Other types of repairs & repair by soldering.

**n. Removable partial denture considerations in maxillofacial prosthetics**

- Maxillofacial prosthetics
- Intra oral prosthesis
- Design considerations
- Maxillary prosthesis
- Obturators
- Speech aids
- Palatal lifts
- Palatal augmentations
- Mandibular prosthesis
- Treatment planning
- Framework design
- Class I resection
- Class II resection
- Mandibular flange prosthesis
- Jaw relation records.

**o. Management of failed restorations and work authorization details.**

**C FIXED PROSTHODONTICS**

- a) Scope,**
- b) Definitions and terminology,**
- c) Classification and principles,**
- d) Design,**
- e) Mechanical and biological considerations of components –**
  - i. Retainers**
  - ii. Connectors**
  - iii. Pontics**
  - iv. Work authorization**

**f) Diagnosis and treatment planning**

Patients history and interview

Patients desires and expectations and needs

Systemic and emotional health

**g) Clinical examinations –**

- i. Head and neck, oral – teeth
- ii. Occlusal and periodontal
- iii. Preparation of diagnostic cast
- iv. Radiographic interpretation
- v. Aesthetics
- vi. Endodontics considerations
- vii. Abutment selection – bone support, root proximities and inclinations,  
selection of abutments for cantilever, pier

**h) Management of Carious teeth –**

- i. Caries in aged population
- ii. Caries control, removal caries
- iii. Protection of pulp
- iv. Reconstruction measure for compromised teeth –
- v. Retentive pins,
- vi. Horizontal slots,
- vii. Retentive grooves,
- viii. Prevention of caries,
- ix. Diet,
- x. Prevention of root caries and vaccine forcaries

**i) Periodontal considerations –**

- Attachment units,
- Ligaments,
- Prevention of gingivitis,
- Periodontitis.
- Microbiological aspect of periodontal diseases,
- Marginal lesion,
- Occlusal trauma,
- Periodontal pockets in attached gingiva,
- Interdental papilla, gingival embrasures,
- Gingival/periodontal prosthesis,
- Radiographic interpretations of periodontia,
- Intraoral, periodontal splinting –
  - i. Fixed Prosthodontics with periodontially compromised dentitions,
  - ii. Placement of margin restorations

**j) Biomechanical principles of tooth preparation –**

Individual tooth preparations –

Complete metal Crowns – P.F.C.,

**All porcelain –**

- i. Cerestore crowns,
- ii. Dicor crowns,
- iii. Inceram etc.
- iv. Porcelain jacket crowns;
- v. Partial 3/4, 7/8,
- vi. Telescopic, pin– ledge, laminates, inlays, onlays.
- vii. Preparations for restoration of teeth–  
Amalgam,  
Glass ionomer and composite resins.  
Resin bond retainers,
- viii. Gingival marginal preparations –  
Design,  
Material selection,
- ix. Biological and mechanical considerations –
- x. Intra coronal retainer and precision attachments
- xi. Custom made and prefabricated

**k) Isolation and fluid control –**

- i. Rubber dam application(s),
- ii. Tissue dilation–soft tissue management for cast restoration,
- iii. Impression materials and techniques,
- iv. Provisional restorations,
- v. Interocclusal records,
- vi. Laboratory support for fixed Prosthodontics,
- vii. Occlusion,
- viii. Occlusal equilibration, articulators,
- ix. Recording and transferring of occlusal relations,
- x. Cementing of restorations

**l) Resins, Gold and gold alloys, glass ionomer, restorations.**

**m) Restoration of endodontically treated teeth,**

**Stomatognathic Dysfunction and management**

**n) Management of failed restorations**

**o) Osseo integrated/ supported fixed Prosthodontics –**  
Osseo integrated/ supported and tooth supported fixed  
Prosthodontics

**p) CAD – CAM Prosthodontics**

**D MAXILLOFACIAL REHABILITATION:**

- Scope
- Terminology
- Definitions
- Cross infection
- Control and hospital waste management
- Work authorization
- Behavioral and psychological issues in Head and neck cancer
- Psychodynamic interactions between clinician and patient.

#### **I. Cancer Chemotherapy: Oral Manifestations**

- Complications
- Management

#### **II. Radiation therapy of head and neck tumors: Oral effects**

- Dental manifestations and dental treatment: Etiology, treatment and rehabilitation (restoration).
- Acquired defects of the mandible
- Acquired defects of hard palate, soft palate
- Clinical management of edentulous and partially edentulous maxillectomy patients
- Facial defects
- Restoration of speech
- Velopharyngeal function
- Cleft lip and palate
- Cranial implants
- Maxillofacial trauma
- Lip and cheek support prosthesis
- Laryngectomy aids
- Obstructive sleep apnoea
- Tongue prosthesis
- Oesophageal prosthesis
- Radiation carriers
- Burn stents
- Nasal stents
- Vaginal and anal stents
- Auditory inserts
- Trismus appliances

- Mouth controlled devices for assisting the handicapped
- Custom prosthesis
- Conformers, and orbital prosthesis for ocular and orbital defects.
- Osseo integrated supported facial and maxillofacial prosthesis.
- Resin bonding for maxillofacial prosthesis,
- Cranial prosthesis Implant rehabilitation of the mandible compromise by radiotherapy,
- Prosthodontic treatment,
- Material and laboratory procedures for maxillofacial prosthesis.

## E OCCLUSION

### EVALUATION, DIAGNOSIS AND TREATMENT OF OCCLUSAL PROBLEMS:

- Scope, definition, terminology, optimum oral health, anatomic harmony, functional harm occlusal stability, causes of deterioration of dental and oral health.
- Anatomical, physiological, neuro – muscular, psychological considerations of teeth
- Muscles of mastication
- Temporomandibular joint
- Intra oral and extra oral and facial musculatures and the functions of Cranio mandib system.
- Occlusal therapy
- The stomatognathic system
- Centric relation, vertical dimension
- The neutral zone
- The occlusal plane
- Differential diagnosis of temporomandibular disorders
- Understanding and diagnosing intra articular problems
- Relating treatment to diagnosis of internal derangements of TMJ
- Occlusal splints.
- Selecting instruments for occlusal diagnosis and treatment, mounting casts
- Pankey-Mann-Schuyler philosophy of complete occlusal rehabilitation
- Long centric
- Anterior guidance
- Restoring lower anterior teeth
- Restoring upper anterior teeth
- Determining the type of posterior occlusal contours
- Methods for determining the plane of occlusion
- Restoring lower posterior teeth
- Restoring upper posterior teeth

- Functionally generated path techniques for recording border movements intra orally
- Occlusal equilibration.
- Bruxism
- Procedural steps in restoring occlusion
- Requirements for occlusal stability
- Solving occlusal problems through programmed treatment planning
- Splinting
- Solving– occlusal wear problems
- Deep overbite problems
- Anterior overjet problems
- Anterior open bite problems
- Treating – end to end occlusion
- Spaced anterior teeth
- Cross bite problems
- Crowded, irregular, or interlocking anterior bite.
- Using Cephalometric for occlusal analysis, solving severe arch mal-relationship problem  
transcranial radiography, postoperative care of occlusal therapy.

## F ESTHETICS

### Scope, definitions

#### Morpho psychology and esthetics, structural esthetic rules –

Facial components

Dental components

Gingival components

Physical components.

#### Esthetics and its relationship to function –

Crown morphology

Physiology of occlusion, mastication, occlusal loading and clinical aspect in bio esthetic aspects

Physical and physiologic characteristic and muscular activities of facial muscle

Perioral anatomy and muscle retaining exercises

#### Smile –

Classification and smile components

Smile design

Esthetic restoration of smile

Esthetic management of the dentogingival unit

Intraoral materials for management of gingival contours, and ridge contours.

Periodontal esthetics

### **Restorations –**

Tooth colored restorative materials

The clinical and laboratory aspects

Marginal fit

Anatomy

Inclinations, form, size, shape, color, embrasures & contact point.

- Infection control, cross infection barrier – clinical &lab ; hospital & lab waste management

### **TMJ – Temporomandibular joint dysfunction**

#### **Scope**

#### **Definitions**

#### **Terminology**

- a) Temporomandibular joint and its function,
- b) Orofacial pain,
- c) Pain from the temporomandibular joint region,
- d) Temporomandibular joint dysfunction,
- e) Temporomandibular joint sounds,
- f) Temporomandibular joint disorders,
- g) Anatomy related,
- h) Trauma, disc displacement,
- i) Osteoarthrosis/Osteoarthritis,
- j) Hyper mobility and dislocation,
- k) Infectious arthritis,
- l) Inflammatory diseases,
- m) Eagle's syndrome (Styloid – stylohyoid syndrome),
- n) Synovial chondromatosis,
- o) Osteochondrosis disease,
- p) Osteonecrosis,
- q) Nerve entrapment process,
- r) Growth changes,
- s) Tumors
- t) Radiographic imaging

- u) Etiology, diagnosis and cranio mandibular pain,
- v) Differential diagnosis and management of orofacial pain –
  - i. Pain from teeth, pulp,
  - ii. Dentin, muscle pain,
  - iii. TMJ pain
    - Psychologic,
    - Physiologic –
  - o Endogenous control
  - o Acupuncture analgesia
  - o Placebo effects on analgesia
  - o Trigeminal neuralgia
  - o Temporal arteritis

#### **Occlusal splint therapy**

- i. Construction and fitting of occlusal splints
- ii. Management of occlusal splints,
- iii. Therapeutic effects of occlusal splints
- iv. Occlusal splints and general muscles performance
- v. TMJ joint unloading and anterior repositioning appliances
- vi. Use and care of occlusal splints

#### **Occlusal adjustment procedures –**

##### **Reversible**

- i. Occlusal stabilization splints and physical therapies
- ii. Jaw exercises
- iii. Jaw manipulation and other physiotherapy

##### **Irreversible therapy**

- i. Occlusal repositioning appliances, orthodontic treatment
- ii. Orthognathic surgery
- iii. Fixed and removable prosthodontic treatment and occlusal adjustment
- iv. Removable prosthodontic treatment and occlusal adjustment.
- v. Indication for occlusal adjustment, special nature of orofacial pain
- vi. Psychopathological considerations, occlusal adjustment philosophies
- vii. Mandibular position, excursive guidance
- viii. Occlusal contact scheme
- ix. Goals of occlusal adjustment
- x. Significance of a slide in centric
- xi. Preclinical procedures

xii. Clinical procedures for occlusal adjustment

### **Scheme of Examination**

#### **A Theory**

Part – I	Basic sciences paper	100 Marks
Part – II	Paper –I Paper-II, Paper-III	300 Marks (100 Marks for each paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of **MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration. Paper-I , Paper-II and Paper III shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Distribution of topics for each paper will be as follows:**

#### **Part-I : *Applied Basic Sciences: Applied Anatomy***

Nutrition & Biochemistry, Pathology & Microbiology, virology, Applied Dental anatomy & histology, Oral pathology & oral Microbiology, Adult and geriatric psychology, Applied dental materials

#### **Part-II :**

**Part-I : *Removable Prosthodontics and Implant supported prosthesis (Implantology), Geriatric dentistry and Cranio facial Prosthodontics***

**Part-II : *Fixed Prosthodontics, Occlusion, TMJ and esthetics.***

**Paper-II Paper-III : *Essays (descriptive and analyzing type questions)***

*\*The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.*

#### **B Practical 300 Marks**

1)	Practical/ Clinical Examination-	200 Marks
2)	Viva voce	100 Marks

#### **1) Practical/ Clinical Examination ( 200 Marks )**

##### **i) Presentation of treated patients and records during their 3years Training period(35 Marks)**

a. C.D.	1 mark
b. R. P.D.	2 marks
c. F.P.D. including single tooth and surface restoration	
d. I.S.P.	5 marks
e. Occlusal rehabilitation	5 marks
f. T.M.J	5 marks
g. Maxillofacial Prosthesis	5 marks
h. Pre-Clinical Exercises	10 marks

##### **ii) Presentation of Clinical Exam CD patient's prosthesis including insertion (75 Marks)**

1	Discussion on treatment plan and patient review	10 marks
2	Tentative jaw relation records	5 marks
3	Face Bow – transfer	5 marks

4	Transferring it on articulators	5 marks
5	Extra oral tracing and securing centric and protrusive/lateral, record	15 marks
6	Transferring records on articulator and programming.	5 marks
7	Selection of teeth	5 marks
8	Arrangement of teeth	10 marks
9	Waxed up denture trial	10 marks
10	Check of Fit, insertion and instruction of previously processed characterized, anatomic complete denture	5 marks
	Prosthesis	

**ALL STEPS WILL INCLUDE CHAIRSIDE, LAB AND VIVA VOCE**

**iii) Fixed Partial Denture**

**( 35 Marks)**

- a. Case discussion including treatment planning and selection of Patient for FPD 5 Marks
- b. Abutment preparation, isolation and fluid control. 15 Marks
- c. Gingival retraction and impressions (Conventional/CAD CAM impressions) 10 Marks
- d. Cementation of provisional restoration. 5 Marks

**iv) Removable Partial Denture**

**( 25 Marks)**

- a. Sueveying and designing of partially dentate cast. 15 Marks
- b. Discussion on components and material selection including occlusal schemes. 10 Marks

**v) Implant supported Prosthesis ( 2<sup>nd</sup> Stage protocol ) ( 30 Marks )**

- a. Case discussion including treatment planning and selection of Patient for ISP. 10 Marks
- b. Stage II Preparation, Abutment selection, placement and evaluation. 10 Marks
- c. Implant impression and making of cast. 10 Marks

**2) Viva voce : ( 100 Marks )**

**i) Viva voce Examination:**

**(80 Marks)**

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expressions, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

**ii) Pedagogy**

**(20 Marks)**

