CONSERVATIVE DENTISTRY & ENDODONTICS

SYLLABUS

PAPER – I: APPLIED ANATOMY OF HEAD & NECK

- Enamel – development and composition, physical characteristics, chemical properties, structure.
- Age changes – clinical structure.
- 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.
- Salivary glands – structure, function, clinical considerations.
- Eruption of teeth.

APPLIED PHYSIOLOGY:

- Mastication, deglutition, and digestion and assimilation, fluid and electrolyte balance.
- Blood composition, volume, function, blood groups, haemostasis, coagulation, blood transfusion, circulation, heart, pulse, blood pressure, shock, respiration, control, anoxia, hypoxia, asphyxia, artificial respiration, and endocrinology – general principles of endocrine activity and disorders relating to pituitary, thyroid, parathyroid, adrenals including pregnancy and lactation.
- 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 such as osmotic pressure, electrolytic dissociation, oxidation, reduction etc. Carbohydrates, proteins, lipids and their metabolism, nucleoproteins, nucleic acid and their metabolism. Enzymes, vitamins and minerals, metabolism of inorganic elements, detoxification in the body, anti metabolites, chemistry of blood lymph and unine.

PATHOLOGY:

- Inflammation, repair, degeneration, necrosis and gangrene.
- Circulatory disturbances – ischemia, hyperemia, edema, thrombosis, embolism, infarction, allergy and hypersensitivity reaction.

- Neoplasms – classifications of tumors, characteristics of benign and malignant tumors spread tumors.
- Blood dyscrasias.
- Developmental disturbances of oral and Para oral structures, dental caries, regressive changes of teeth, pulp, periapical pathology, pulp reaction to dental caries and dental procedures.
- Bacterial, viral, mycotic infections of the oral cavity.

MICROBIOLOGY:

- Pathways of pulpal infection, oral flora and micro organisms associated with endodontic diseases, pathogenesis, host defense, bacterial virulence factors, healing, theory of focal infections, microbes or relevance to dentistry – streptococci, staphylococci, lactobacilli, cornyebacterium, actinomycetes, clostridium, neisseria, vibrio, bacteriodes, 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. Culture medium and culturing technique (Aerobic and anaerobic interpretation and antibiotic sensitivity test).

PHARMACOLOGY:

- Dosage and route of administration of drugs, actions and fate of drug in body, drug addiction, tolerance of hypersensitivity reactions.
- Local anesthesia – agents and chemistry, pharmacological actions, fate and metabolism of anaesthetic, ideal properties, techniques and complications.
- General anesthesia – pre medications, neuro muscular blocking agents, induction agents, inhalation anesthesia, and agents uses, assessment of anesthetic problems in medically compromised patients.
- Anaesthetic emergencies.
- Antihistamines, corticosterods, chemotherapeutic and antibiotics, drug resistance, haemostasis, and haemostatic agents, anticoagulants, sympathomimetic drugs, vitamins and minerals (A, B, C, D, E, K IRON), anti-sialogogue, immunosupressants, drug interactions, antiseptics, disinfectant agents, drugs acting on CNS.

BIOSTATISTICS:

- Introduction, 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 extract test, Sign test, Median test, Mann Whitney test, Kruskall Wallis one way analysis, Friedman two way analysis, Regression analysis), Correlation and regression, Use of computers.

RESEARCH METHODOLOGY:

- Essential features of a protocol for research in humans.
- Experimental and non-experimental study designs.
- Ethical considerations of research.

APPLIED DENTAL MATERIALS:

- Physical and mechanical properties of dental materials, biocompatibility.
- Impression materials, detailed study of various restorative materials, restorative resin and recent advances in composite resins, bonding – recent developments – tarnish and corrosion, dental amalgam, direct filling gold, casting alloys, inlay wax, die materials, investments, casting procedures, defects, dental cements for restoration and pulp protection (luting, liners, bases) cavity varnishes.

PAPER – II: CONSERVATIVE DENTISTRY

1. Examination, diagnosis and treatment plan.
2. Occlusion as related to conservative dentistry, contact, contour, its significance. Separation of teeth, matrices, used in conservative dentistry.
3. Dental caries – epidemiology, recent concept of etiological factors, pathophysiology, Histopathology, diagnosis, caries activity tests, prevention of dental caries and management – recent methods.
4. Hand and rotary cutting instruments, development of rotary equipment, speed ranges, hazards.
5. Dental burs and other modalities of tooth reparation – recent developments (air abrasions, lasers etc)
6. Infection control procedures in conservative dentistry, isolation equipments etc.
7. Direct concepts in tooth preparation for amalgam, composite, GIC and restorative techniques, failures and management.
8. Direct and indirect composite restorations.
9. Indirect tooth colored restorations – ceramic, inlays and onlays, veneers, crowns, recent advances in fabrication and materials.
   a. Tissue management.

10. Impression procedures used for indirect restorations.
11. Cast metal restorations, indications, contraindications, tooth preparation for class 2 inlay, Onlay full crown restorations.

    Restorative techniques, direct and indirect methods of fabrication including materials used for fabrication like inlay wax, investment materials and

12. Direct gold restorations.

13. Recent advances in restorative materials and procedures.
14. Management of non-carious lesion.
15. Advance knowledge of minimal intervention dentistry.
16. Recent advances in restoration of endodontically treated teeth and grossly mutilated teeth.
17. Hypersensitivity, theories, causes and management.
18. Lasers in conservative Dentistry.
19. CAD-CAM & CAD-CIM in restorative dentistry.
20. Dental imaging and its applications in restorative dentistry (clinical photography)
21. Principles of esthetics.

- Color
- Facial analysis
- Smile design
- Principles of esthetic integration
- Treatment planning in esthetic dentistry

<u>PAPER – III:</u> ENDODONTICS

1. Rationale of endodontics.
2. Knowledge of internal anatomy of permanent teeth, anatomy of root apex and its implications in endodontic treatment.
3. Dentin and pulp complex.
4. Pulp and periapical pathology.
5. Pathobiology of periapex.
6. Diagnostic procedure – recent advances and various aids used for diagnosis.
   a. Orofacial dental pain emergencies: endodontic diagnosis and management
7. Case selection and treatment planning.
8. Infection control procedures used in Endodontics (aseptic techniques such as rubber dam, sterilization of instruments etc.)
9. Access cavity preparation – objectives and principles.
10. Endodontic instruments and instrumentation – recent developments, detailed description of hand, rotary, sonic, ultra sonic etc.
11. Working length determination / cleaning and shaping of root canal system and recent development in techniques of canal preparation.
12. Root canal irrigants and intra canal medicaments used including non-surgical Endodontics by calcium hydroxide.
13. Endodontic microbiology.
14. Obturating materials, various obturation techniques and recent advances in obturation of root canal.
15. Traumatic injuries and management- endodontic treatment for young permanent teeth. Pediatric Endodontics – treatment of immature apex.
16. Endodontic surgeries, recent development sin technique and devices, endo-osseous endodontic implants- treatment of immature apex.
17. Endodontic interrelationship, Endo-Perio lesion and management.
18. Drugs and chemicals used in Endodontics
19. Endo emergencies and management.

20. Restoration of endodontically treated teeth, recent advances.
21. Geriatric Endodontics
22. Endo emergencies and management.
23. Biologic response of pulp to various restorative materials and operative procedures.
24. Lasers in Endodontics.
25. Multidisciplinary approach to endodontics situations.
26. Endodontics radiology – digital technology in endodontics practice.
27. Local anesthesia in endodontics.
28. Procedural errors in endodontics and their management.
29. Endodontics failures and retreatment.
30. Resorptions and its management.
31. Microscopes in endodontics.
32. Single visit endodontics, current concepts and controversies.

PAPER – IV: Essay . { Includes all the portions of Paper –I, Paper –II & Paper –III}

Preclinical Work

(Duration - first 6 Months of First Year MDS)

PRE-CLINICAL EXERCISES ON PLASTER MODELS

Pre Clinical Work – Operative and Endodontics

Preclinical work on typhodont teeth

1. Class 2 amalgam cavities
   a. Conservative preparation. - 03
   b. Conventional preparation - 03
2. Inlay cavity preparation on premolars
   And molars – MO, DO, MOD - 10

   a. Wax pattern - 06
   b. Casing - 04
3. Onlay preparation on molars - 02
   a. Casting - 01
4. Full Crown
   a. Anterior - 05
   b. Posterior - 05
   (2 each to be processed)

5. 7/8 crown - 02
   (1 to be processed)

6. 3 / 4 crown premolar - 02
   (1 to be processed)

Pre Clinical work on natural teeth

1. Inlay on molars and premolars MO, Do, and MOD - 08
    a. Casting - 02
    b. Wax pattern - 02
2. Amalgam cavity preparation
    a. Conventional - 02
    b. Conservative - 02
3. Pin retained amalgam on molar teeth - 02
4. Post and core build up
    a. Anterior teeth - 10
    b. Posterior teeth - 05
5. Casting
    a. Anterior - 04
    b. Posterior - 02
6. Onlay on molars - 03
   (1 to be processed)

7. Full crown premolars and molars - 04
8. Full crown anterior - 06
   (2 and 3 to be processed)

9. Veneers anterior teeth (indirect method) - 02
10. Composite inlay (class 2) - 03
    (1 to be processed)

11. Full tooth wax caring – all permanent teeth
12. **PRE – CLINICAL ENDODONTIC EXERCISES**

SR NO.	EXERCISE	TOOTH NO.
1	Access cavity preparation	21 to 27 31 to 37
2	Access under magnification	16,31,41,46
3	Hand Instrumentation using conventional method Obturation with lateral condensation.	11
4	Hand Instrumentation using Step Back Technique obturation with warm vertical condensation	24
5	Hand Instrumentation using Crown Down technology and obturation with Warm Vertical Condensation	26
6	Access cavity & Rotary instrumentation for cleaning and shaping, obturation using various techniques	34,36, 37,41

7	Create a Blunderbuss canal on central incisor. MTA plug and back fill with thermoplaticized GP,	11/21
8	Instrument retrieval	16
9	Cast post and core	11/21
10	Tooth sections of all the teeth a. longitudinal section b. cross section through crown Coronal third Middle third Apical third	

CLINICAL WORK QUOTA FOR POST – GRADUATE COURSE

1. AMALGAM RESTORATIONS: **100** (I, II, III MDS)

a. Class I:
b. Class II:
c. MOD:
d. Pin-retained

2. INLAYS: **20** (II & III MDS)

a. Class II

3. ONLAYS: 10 (III MDS)

4. GLASS IONOMER CEMENT RESTORATIONS: 25

5. COMPOSITE RESIN RESTORATIONS: 100 (I, II & III MDS)

6. ANTERIOR ROOT CANAL TREATMENT: 100 (I, II MDS)

7. POSTERIOR ROOT CANAL TREATMENT: 200 (II, III MDS)

8. POST & CORE:

a. Custom (Cast): 25
b. Prefabricated: 25

9. CROWNS: ANTERIOR – 25 POSTERIOR – 25

10. BRIDGES: 05 (III MDS)

11. BLEACHING:

a. Vital: 05
b. Non – vital: 05

12. ENDODONTIC SURGERIES: (II, III MDS)

a. Peri-apical surgeries: 05
b. Root resections: 05
c. Hemisections: 05

13. MISCELLANEOUS – Splinting, Re-attachment, Inter-disciplinary cases, etc **-5**

FORMATIVE EVALUATION PATTERN

Evaluation pattern of the department

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.

Exam pattern by the department:

MDS Part I	Once every three Months	100 marks	3 hours
MDS Part II	Once every Month.	100 marks	3 hours
MDS Part III	Once Every Week.	100 marks	3 hours

Pre-clinical and clinical examination is conducted accordingly.

SUMMATIVE EVALUATION PATTERN

20. **Theory** 400 marks

Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 100. Paper-I, Paper-II and Paper-III shall consist of two long questions carrying 20 marks each and 6 short essay questions each carrying 10 marks. Paper-IV will be on essay. Question on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows:-

PAPER – I: APPLIED ANATOMY OF HEAD AND NECK, APPLIED PHYSIOLOGY, PATHOLOGY, MICROBIOLOGY,PHARMACOLOGY, BIOSTATISTICS, RESEARCH METHODOLOGY, APPLIED DENTAL METERIALS

PAPER – II: CONSERVATIVE DENTISTRY

PAPER – III: ENDODONTICS

Paper-IV: Essay

The topic assigned to the different papers is generally evaluated under these 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 of topics.

B. Practical examination: 400 marks (conducted for a minimum of 2 days)

A	Preparation of Cast post	100 Marks
B	Cavity Preparation for Class –II inlay (metal)	75 Marks
C	Restoration of class – IV Lesion with composite resin	75 Marks
D	Endodontic Access Cavity preparation in Molar	50 Marks
E	Viva – Voce	100 Marks
	TOTAL MARKS	**400 Marks**

A Cast post & core patient

a	Case selection	10 marks
b	Post space preparation	25 marks
c	Post space preparation (Direct wax pattern)	20 marks
d	Evaluation of casting	10 marks
e	Cementation of casting	10 marks
f	Crown preparation	15 marks
g	Recording of impression	10 marks
	Total	100 marks

B Cavity Preparation for Class –II inlay (metal)

Case selection	10 marks
Cavity preparation	40 marks
Direct Wax pattern preparation	25 marks
Total	75 marks

C Restoration of class – IV Lesion with composite resin

Case Selection	10 marks
Rubber dam application	15 marks
Cavity Preparation	10 marks
Restoration of cavity	20 marks
Finishing & Polishing Of Restoration	20 marks
Total	75 marks

D Endodontic Access Cavity preparation in Molar

Case Selection	5 marks
Rubber dam application	10 marks

Evaluation of the access cavity	20 marks
Determination Working length (Radiographically	15 marks
Total	50 marks

E Viva Voce

Grand viva	80 marks
Pedagogue	20 marks