

YENEPOYA



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(DEEMED TO BE UNIVERSITY)

Recognized under Sec 3(A) of the UGC Act 1956

Accredited by NAAC with 'A' Grade

**POST GRADUATE
COURSE**

SYLLABUS

Subject

CONSERVATIVE DENTISTRY AND ENDODONTICS

OBJECTIVES:

The following objectives are laid out to achieve the goals of the course. These are to be achieved by the time the candidate completes the course. These objectives may be considered under the following subtitles.

KNOWLEDGE:

At the end of 36 months of training, the candidates should be able to:

- Describe aetiology, pathophysiology, periapical diagnosis and management of common restorative situations, endodontic situations that will include contemporary management of dental caries, management of trauma and pulpal pathoses including periodontal situations.
- Demonstrate understanding of basic sciences as relevant to Conservative / Restorative Dentistry and Endodontics.
- Identify social, economic, environmental and emotional determinants in a given case or community and take them into account for planning and execution at individual and community level.
- Ability to master differential diagnosis and recognize conditions that may require multi-disciplinary approach or a clinical situation outside the realm of the specialty, which he or she should be able to recognize and refer to appropriate specialist.
- Update himself by self study and by attending basic and advanced courses, conferences, seminars, and workshops in the specialty of Conservative Dentistry - Endodontics - Dental Materials and Restorative Dentistry.
- Ability to teach / guide colleagues and other students.

Use information technology tools and carry out research both basic and clinical with the aim of his publishing his work and presenting the same at scientific platform.

SKILLS:

- Take proper chair side history, exam the patient & perform medical & dental diagnostic procedures& order as well as perform relevant tests& interpret them to come to a reasonable diagnosis about the dental condition in general and conservative dentistry_Endodontics in particular. And undertake complete patient monitoring including preoperative as well as post operative care of the patient.
- Perform all levels of restorative work and surgical and nonsurgical Endodontics including endodontic endosseous implants, as well as endodontic periodontal surgical procedures as part of multidisciplinary approach to clinical condition.
- Provide basic life saving support in emergency situations.
- Manage acute pulpal and pulpo periodontal situations.
- Have a thorough knowledge of infection control measures in the dental clinic environment and laboratories.

Human values, Ethical Practice and Communication Abilities

- Adopt ethical principles in all aspects of restorative and contemporary Endodontics including non surgical and surgical Endodontics.
- Professional honesty and integrity should be top priority.
- Dental care has to be provided regardless of social status, caste, creed, or religion of the patient.
- Develop communication skills in particular to explain various options available management and obtain a true informed consent from the patient.
- Apply high moral and ethical standards while carrying on human or animal research.
- He/She shall not carry out any heroic procedures and must know his limitations in performing all aspects of restorative dentistry including Endodontics.
- Ask for help from colleagues or seniors when required without hesitation.
- Respect patient's rights and privileges including patient's right to information.

FIRST YEAR PG PROGRAMME

PRE CLINICAL EXERCISES FOR POST GRADUATES

PLASTER MODEL PREPARATIONS

- Class 1 , 2 for amalgam design and filling carving with pink wax
- Inlays & onlays

EXTRACTED TEETH

- Class 1 & 2 all types for amalgam
- Class 3 & 5 for Composites
- Inlays & onlays
- Full crowns & Jacket crowns
- 3 / 4 Crown in Canines
- Mesial & Distal half crowns in posteriors
- Veneering in anteriors
- Separable Dies , indirect wax pattern and casting of crown & inlay & bridge

TOOTH CARVING & SECTIONING OF TOOTH

ENDODONTICS

- Access cavity preparation in all teeth
- Negotiation of MB 2 canals in 10 teeth
- Detection of second canal in mandibular anteriors
- Working length determination

- Cleaning & shaping all techniques
- Irrigation with various materials
- Obturation various methods
- Post & Core preparations custom cast post & readymade posts

PRE CLINICAL EXERCISES ON PLASTER MODEL

		Exercise	Upper Molar	Lower Molar
Amalgam	{	Class I Conventional Tooth	01	01
		Class I Conservative Tooth	01	--
		Class I [Buccal Extension (Lower Molar)/ Palatal Extension(Upper Molar)] Any one	01	01
		Class II Conventional (MO)	01	01
		Class II Conservative (MO)	01	01
		Class II (MOD)	01	01
		Inlay	{	Class I Inlay
Class II Inlay(Mo)	01			01
Class III Upper Anterior (01)				

Total 14 Exercises

COURSE CONTENTS:

PAPER I: APPLIED ANATOMY OF HEAD AND NECK

- Development of face, paranasal sinuses and the associated structures and their anomalies, cranial and facial bones, TMJ anatomy and function, arterial and venous drainage of head and neck, muscles of face and neck including muscles of mastication and deglutition, brief consideration of structures and function of brain. Brief consideration of all cranial nerves and autonomic nervous system of head and neck. Salivary glands, Functional anatomy of mastication, deglutition and speech. Detailed anatomy of deciduous and permanent teeth, general consideration in physiology of permanent dentition, form, function, alignment, contact, occlusion.
- Internal anatomy of permanent teeth and its significance.
- Applied histology - histology of skin, oral mucosa, connective tissue, bone cartilage, blood vessels, lymphatics, nerves, tongue.

DEVELOPMENT OF TEETH:

- Enamel - development and composition, physical characteristics, chemical properties, structure.
- Age changes- clinical structure.
- Dentin- development, physical characteristics, chemical properties, structure type of dentin, innervations, age and functional changes.

- Pulp- development, histological structures, innervations, functions, regressive changes, clinical considerations.
- Periodontal ligament development, structure, function and clinical considerations.
- Salivary glands- structure, function, clinical considerations.
- Eruption of teeth.

APPLIED PHYSIOLOGY:

- Mastication, deglutition, digestion and assimilation, fluid and electrolyte balance.
- Blood composition, volume, function, blood groups, haemostasis, co-agulation, 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 parasympathetic 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, lipids and their metabolism, nucleoproteins, nucleic acid and their metabolism. Enzymes, vitamins and minerals, metabolism of inorganic elements, detoxification in the body, antimetabolites, chemistry of blood lymph and urine.

PATHOLOGY

- Inflammation, repair, degeneration, necrosis and gangrene
- Circulatory disturbances – Ischemia, Hyperemia, Edema, thrombosis, embolism, infarction, allergy and hypersensitivity reaction.
- Neoplasm – classifications of tumors, characteristics of benign and malignant tumors, spread tumors.
- Blood dyscrasias
- Developmental disturbances of oral and paraoral 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 microorganisms associated with endodontic diseases, pathogenesis, host defense, bacterial virulence factors, healing, theory of focal infections, microbes or relevance to dentistry – strepto, staphylococci, lactobacilli, cornyebacterium, actinomycetes, clostridium, neisseria, vibrio, bacteroids, fusobacterium, 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 culture technique (Aerobic and anaerobic interpretation and antibiotic sensitivity test).

PHARMACOLOGY

- Dosage and route of administration of drugs, action and fate of drug in the body, drug addiction, tolerance of hypersensitivity reactions
- Local anesthesia – agents and chemistry, pharmacological actions, fate and metabolism of anesthetic, ideal properties, techniques and complications
- General Anesthesia – pre-medications, neuromuscular blocking agents, induction agents, inhalation anesthesia and agents used assessment of anesthetic problems in medically compromised patients.
- Anesthetic emergencies
- Anti-histamines, Corticosteroids, chemotherapeutic and antibiotics, drug resistance, hemostasis, and hemostatic agents, anticoagulants, sympathomimetic drugs, vitamins and minerals (A, B, C, D, E, K IRON) antisialogogues, immunosuppressants, drug interactions, antiseptics, disinfectants, anti-viral 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. Test of significance – parametric and non-parametric tests (Fisher Exact Test, Sign Test, Median Test, Mann Whitney test, Krusical Wallis one way analysis, Friedmann 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 consideration 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.

- Dental ceramics-recent advances, finishing and polishing materials.
- Dental burs - design and mechanics of cutting - other modalities of tooth preparation.
- Methods of testing biocompatibility of materials used.

PART II

PAPER-I: 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, QIC 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, 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 arid 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 arid 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

PAPER-II: 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 principle
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 developments in technique and devices, endosseous endodontic implants - biology of bone and wound healing.
17. Endo-perio 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 endodontic situation;
26. Endodontics radiology- digital technology in endodontic 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.

TEACHING / LEARNING ACTIVITIES:

The following is the minimum required to be completed before the candidate can be considered eligible to appear for final MDS exam.

First Year

Pre Clinical Work - Operative and Endodontics Preclinical work on typhodont teeth

1. Class 2 amalgam cavities
 - a. Conservative preparation -03(2 Upper, 1 Lower)
 - b. Conventional preparation -03(2 Lower, 1 Upper)
2. Inlay cavity preparation on premolars and molars
- MO, DO, MOD -10(5 Upper, 5 Lower,
 - a. Wax pattern - 06 1 MO
 - b. Casting - 04 1 DO } Molar
3. Onlay preparation on molars - 02 1 MOD }
 - a. Casting - 01 1 MO } PM
 4. Full Crown 1 DO }
 - a. Anterior - 05
 - b. Posterior (2 each to be processed) -05
5. 7/8 crown -02
(1 to be processed)
6. 3 / 4 crown premolars -02
(1 to be processed)

Pre Clinical work on natural teeth

1. Inlay on molars and premolars MO, DO, MOD -08 (4 Upper, 3 Lower/1PM
(4 Lower, 3 Molar/ 1 PM)
 - a. Casting - 02
 - b. Wax pattern -02
2. Amalgam cavity preparation
 - a. Conventional -02(1 Upper, 1 Lower)
 - b. Conservative -02(1Upper, 1 Lower)
3. Pin retained amalgam on molar teeth -02
4. Post and core build up
 - a. Anterior teeth -10
 - b. Posterior teeth -05(any PM,M)
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 carving - all permanent teeth

ENDODONTICS:

1. Sectioning of all maxillary and mandibular teeth.
2. Sectioning of teeth - in relation to deciduous molar, 2nd primary upper and lower molar 1 each
3. Access cavity opening and root canal therapy in relation to maxillary and mandibular permanent teeth,
4. Access cavity preparation and BMP Anterior
 - a. Conventional prep
 - b. Step back
 - c. Crown downObturation 03
5. BMP Premolar 06 (2 upper and 2 lower) obturation 1 each
6. BMP Molar 06 (3 upper - 2 first molars and 1 second molar, 3 lower - 2 first molars and 1 second molar) obturation 1 each
7. Post and core preparation and fabrication in relation to anterior and posterior teeth
 - a. Anterior 10 (casting 4)
 - b. Posterior 05 (casting 2)
8. Removable dies 04

Note: Technique work to be completed in the first four months

CLINICAL WORK:

A	Composite restorations	30
B	GIC Restorations	30
C	Complex amalgam restorations	05
D	Composite inlay + veneers (direct and indirect [^])	05
E	Ceramic jacket crowns	05
F	Post and core for anterior teeth	05
G	Bleaching vital	05
	Non vital	05
H	RCT Anterior	20
I	Endo surgery - observation and assisting	05

Presentation of:

- Seminars - 5 seminars by each student - should include topics in dental materials, conservative dentistry and Endodontics
- Journal clubs - 5 by each student
- Submission of synopsis at the end of 6 months
- Library assignment work
- Internal assessment - theory and clinical.

Second Year

Case discussion- 5

1	Ceramic jacket crowns	10
2	Post and core for anterior teeth	10

3	Post and core for posterior teeth	05
4	Composite restoration	05
5	Full crown for posterior teeth	15
6	Cast gold inlay	05
7	Other special types of work such as splinting - Reattachment of fractured teeth etc.	05
8	Anterior RCT	20
9	Posterior RCT	30
10	Endo surgery performed independently	05
11	Management of endo- Perio problems	05

- Under the graduate teaching program as allotted by the HOD
- Seminars – 5 by each student
- Journal Club – 5 by each student
- Dissertation work
- Prepare scientific paper and present in conference and clinical meeting
- Library assignment to be submitted 18 months after starting of the course
- Internal assessment – theory and clinical

Third Year

Dissertation work to be submitted 6 months before final examination

Clinical Work

- Cast Gold Inlay, Onlay, Cuspal Restorations 10
- Post and Core 20
- Molar Endodontics 50
- Endo Surgery 05
- All other types of surgeries including crown lengthening, perioesthetics, hemi sectioning, splinting, replantation, endodontic implants.

Presentation of:

- 5 Seminars
- 5 Journal Clubs
- Teaching – lecture (under graduates)
- Internal assessment – theory and clinical

STUDENT CENTERED LEARNING MEASURES

- ✚ Assessment of the students are done on a regular basis by conducting internal exams.
- ✚ These evaluation are done by the staff members. Students who perform below standard are given remedial classes, assignments and they are re-evaluated .
- ✚ Allotments of guides to individual students – for better assessment
- ✚ Special emphasis is given on their clinical skills by giving them chair side training as well as on simulated models.
- ✚ Mock exams are conducted to give them more confidence to prepare for the final exams.
- ✚ Student feedback taken periodically to know whether they are able to understand what is being taught to them and if any special emphasis required for a particular topic or clinical procedure.

MONITORING LEARNING PROGRESS:

It is essential to monitor the learning progress of 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.

SCHEME OF EXAMINATION:

Theory: Part I: Basic Sciences Paper -100 Marks

Part II: Paper-I, Paper-II & Paper –III - 300 Marks(100Marks for each Paper .

The university Examination shall consist of Theory, Practical and Clinical Examination and viva-voce and Pedagogy.

(i) Theory:

Part I: Shall consist of one Paper

There shall be a Theory Examination in the Basic Sciences at the end of 1st Year of course. The question papers shall be set and evaluated by the concerned Department/Specialty. Candidates shall have to secure a minimum of 50% in the Basic Sciences and shall have to pass the Part-I Examination at least six months prior to the final(part II) Examination.

Part-II: shall consist of three papers,

(ii) Practical and Clinical Examination:

(iii) Viva-voce; and

(iv) Pedagogy.

Part –I

Paper I: Applied Basic Sciences: Applied Anatomy, Physiology including Oral Microbiology, Pharmacology, Biostatistics and Research Methodology and Applied Dental Materials.

Part-II

Paper I : Conservative Dentistry

Paper II : Endodontics

Paper III : Descriptive and analyzing type question

1) Part I University Examination (100 Marks)

There shall be 10 questions of 10 Marks each (Total of 100 Marks)

2) Part II(3 Papers of 100 Marks)

- i. Paper-I: 2 Long Essay questions of 25 Marks each and 5 short Essays of 10 Marks each(Total of 100 Marks)
- ii. Paper-II: 2 Long Essay questions of 25 Marks each and 5 Short Essays of 10 Marks each.(Total of 100 Marks)
- iii. Paper III:2 out of 3 Essay Questions(50X2=100 Marks)

Practical and Clinical Examination : 200 Marks

Viva-Voce and Pedagogy: 100 Marks

Teaching/Learning Activities and Monitoring Learning Progress

All the candidates registered for MDS will pursue the course for 3 year as full time student. During this period, each student shall take part activity in learning activities.

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. The monitoring will be done by the staff of the department based on participation of students in various teaching / learning activities using Assessment Proforma.

The number of activities attended and the topics prevented are to be recorded in log book. The log book will be periodically validated by the supervisors.

1. Acquisition of Knowledge

Journal Review Meeting (Journal Club): The trainees should make presentation from the allotted journals of selected article at least five times in a year. The ability to do literature search, in depth study, presentation skills and use of audio-visual aids will be assessed during presentation. The assessment will be made by faculty will be made by faculty members and peer attending the meeting .

Seminars: The seminars may be held at least twice a week in each postgraduate department. All candidates are expected to participate actively and enter relevant detail in the logbook. Each candidate shall make at least five seminars presentations in each year. The topics should be assigned to the students well in advance to facilitate in depth study. The ability to do literature search, in depth study, presentation skill and use of audio-visual aids are to be assessed.

Symposium : Symposium on topics covering multiple disciplines will be held periodically

Inter Disciplinary Clinical Meeting: The Inter Disciplinary Clinical Meeting will be held once a month, and attended by all departments. The PG Student is encouraged to present the clinical details, radiological, and histo-pathological interpretations, and participation in the discussion.

i) **Clinical skills**

Day to day work: Skills in our patient and ward work will be assessed periodically. The assessment includes candidate's sincerity and punctuality, analytical ability and communication skills (Assessment Proforma 3, Section II) Clinical Meetings: Candidates should periodically present cases to his peers and faculty members. This is assessed using a check list (assessment Proforma 4, Section II)

ii) **Teaching skills:** All the candidates are encouraged to take part in undergraduate teaching programs, in the form of lectures or group discussions. This performance is based on assessment by the faculty members of the department and from feedback from the undergraduate students(Proforma 5, Section II)

iii) **Periodic tests:** The departments will conduct periodical tests. A mock exam will be held three months before the final examination. The tests include written papers, practical/clinical and viva voce.

iv) **Work Diary/ Log Book:** Every candidates will maintain a work diary and record his/her participation in the training programme conducted by the department such as journal reviews, seminars, etc., special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures.

v) **Records:** Records, log books and marks obtained in tests will be maintained by the Head of the Department.

Continuing dental education programme: The department will organize these programs or regular basis involving other institutions. The trainees shall also be encouraged to attend such programs conducted elsewhere

Conference/workshop/advanced courses: The trainee shall be encouraged not only to attend conferences/workshops/advanced courses, but also to present at least 2 papers at state, national specially meetings during their training period. Dissertation: Every candidate shall prepare a dissertation based on the clinical or experimental work or any other study conducted by them under the supervision of the postgraduate guide.

USE OF ICT

Live demonstrations of clinical cases using operative microscope.

Postgraduates

Class I & II Inlay cavity preparation & wax pattern

Access cavity preparation and BMP Anterior

a. Conventional preparation

b. Step back

c. Crown down

Obturation & Post obturation procedures

Videos of various clinical procedures are displayed.

Rotary endodontics

Obturation using various thermo plasticized gutta percha techniques