

SYLLABUS

**for Courses affiliated to the
Kerala University of Health Sciences
Thrissur 680596**



**Master of Dental Surgery (MDS)
Conservative Dentistry and Endodontics
Course Code: 244
(2022-2023 Academic year onwards)**

Modified as per DCI MDS Course (3rd Amendment) Regulations 2019

2 COURSE CONTENT

2.1 Title of course:

MDS Conservative Dentistry and Endodontics

2.2. Objectives of course

1. Goals

The goals of postgraduate training in various specialties are to train the BDS graduate who will:

- Practice respective specialty efficiently and effectively, backed by scientific knowledge and skill.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing professional education in the specialty and allied specialties irrespective of whether in teaching or practice.
- Willing to share the knowledge and skills with any learner, junior or a colleague.
- To develop the faculty for critical analysis and evaluation of various concepts and views, to adopt the most rational approach.

2. Objectives

The objective is to train a candidate so as to ensure higher competence in both general and special area of interest and prepare him for a career in teaching, research and specialty practice. A candidate must achieve a high degree of clinical proficiency in the subject matter and develop competence in research and its methodology as related to the field concerned.

The above objectives are to be achieved by the time the candidate completes the course. The objectives may be considered as under –

1. Knowledge (Cognitive Domain)
2. Skills (Psychomotor Domain)
3. Human values, ethical practice and communication abilities.

a) Knowledge

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

- Describe etiology, pathophysiology, periapical diagnosis and management of common restorative situations, endodontic situations that will include contemporary management of dental caries, management of trauma and pulpal pathosis 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 publishing the work and presenting the same at scientific platform.

b) Skills

- Take proper chair side history, examine the patient and perform medical and dental diagnostic procedures as well as perform relevant tests and 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, surgical and non-surgical Endodontics 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 clinical environment and laboratories.
- Should have proper knowledge of sterilization procedures

c) 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 the 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 for management and to 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/her 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 patients right to information.

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Conservative Dentistry and Endodontics deals with the etiology, diagnosis, prevention and treatment of the diseases and injuries of the hard dental tissues, pulp of the tooth and associated periapical conditions.

2.5 Duration

The course shall be of three years duration. All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as full time candidates in an institution affiliated to and approved for Postgraduate studies by KUHS, observing the norms put forward by the DCI.

- There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgeoncy or equivalent research experience.
- No student shall be permitted to complete the course by attending more than 6 continuous years.
- A candidate selected for admission in a Dental College is obliged to follow the curriculum, rules and regulations as approved by the Dental Council of India and the University. Curriculum, rules or regulations are subject to changes from time to time.

2.6 Subjects

Syllabus for MDS – Conservative Dentistry and Endodontics

The syllabus for the theory of Conservative Dentistry and Endodontics should cover the entire field of the subject and the following topics may be used as guidelines. The concept of health care counselling shall be incorporated in all relevant areas.

SYLLABUS FOR MDS PART- I:

Applied Basic Sciences:

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, muscles, tongue.

Anatomy and Development of Teeth:

- 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 and clinical considerations.
- Pulp – development, histological structures, innervations, functions, regressive changes, clinical considerations.
- Dentin and pulp complex.
- Cementum – composition, cementogenesis, structure, function, clinical considerations.
- Knowledge of internal anatomy of permanent teeth, anatomy of root apex and its implications in endodontic treatment.

- Periodontal ligament – development, structure, function and clinical considerations.
- Salivary glands – structure, function, clinical considerations.

Applied Physiology:

- Mastication, deglutition, 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 urine.

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 of 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 microorganisms associated with endodontic diseases, pathogenesis, host defense, bacterial virulence factors, healing, theory of focal infections, microbes relevance to dentistry –

- strepto, staphylococci, lactobacilli, cornyebacterium, actinomycetes, clostridium, neisseria, vibrio, bacteriods, 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 Microscopy, Immunological Methods, Molecular biology techniques (PCR, DNADNA Hybridisation, Denaturing Gradient Gel Electrophoresis, Terminal-RFLP, DNA Microarrays, Fluorescence In Situ Hybridization
- 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.
- Analgesics - opioid and nonopioid
- 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 used, assessment of anesthetic problems in medically compromised patients.
- Anaesthetic emergencies
- Antihistamines, corticosteroids, chemotherapeutic and antibiotics, drug resistance, haemostasis, and haemostatic agents, anticoagulants, sympathomimetic drugs, vitamins and minerals (A, B, C, D, E, K IRON), antisialogogue, immunosuppressants, drug interactions, antiseptics, disinfectants, antiviral agents, drugs acting on CNS.
- Dental Pharmacology - Antiseptics and disinfectants, Astringents, Sialogogues Disclosing agents, Antiplaque agents, Dentrifices, Artificial saliva, Fluoride pharmacology Pharmacology of re - mineralizing agents

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 exact test, Sign test, Median test, Mann Whitney test, Kruskal Wallis one

way analysis, Friedmann two way analysis, ANOVA, 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, acid etching and recent advances in composite resins, Enamel & Dentin bonding-challenges in bonding to dentin, Hybrid layer, Dentin Bonding Agents, Recent developments, Dentin stabilization & Agents, Water tree, Debonding, Posterior composites, composite veneers, 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.
- Bioceramic materials- cements, sealers, Endodontic materials, Root Canal sealers, Gutta percha, Perforation repair materials, Retrograde filling materials

SYLLABUS FOR MDS 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 concepts 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. Biologic response of pulp to various restorative materials and operative procedures.
 9. Direct composite restorations. Tooth preparation, adhesive application, incremental placement and polymerization techniques, Matrix systems for composites, contact forming instruments, special placement methods, alternative polymerization techniques.
 10. Indirect tooth colored restorations- Indirect composite restorations ceramic, inlays and onlays, veneers, crowns, recent advances in fabrication and gingival tissue management.
 11. Impression procedures used for indirect restorations.
 12. 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
 13. . and casting
 14. Direct gold restorations.
 15. Recent advances in restorative materials.
 16. Esthetics including smile design, Facial and Dental proportions, Emergence profiles, Smile design, Diastema closure, Direct and Porcelain veneers, Esthetic posts and cores
 17. Management of non-cariou lesions.
 18. Management of discolored tooth – Bleaching, Color and Shade selection and matching, Ultraconservative restorative dentistry, Clark's preparation for posterior composite restorations, Finishing and Polishing
 19. Minimal intervention dentistry.
 20. Recent advances in restoration of endodontically treated teeth and grossly mutilated teeth.
 21. Hypersensitivity-theories, causes and management.
 22. Lasers in Conservative Dentistry.
 23. CAD-CAM in restorative dentistry.
 24. Digital imaging and its applications in restorative dentistry.
 25. Clinical Photography.
 26. Nanoparticles in Restorative dentistry

Paper-II: Endodontics

1. Rationale of endodontics.
2. Pulp and periapical pathology – Structure and functions of Dentin and pulp complex, Biofilm in perapical pathology.
3. Pathobiology of periapex- Apical periodontitis, Pathogenesis, Host defense.
4. Diagnostic procedures – Orofacial dental pain emergencies: endodontic diagnosis and management, recent advances used for diagnosis, special tests.
5. Case selection and treatment planning- pulp vitality tests, Laser Doppler Flowmetry(LDF), PeriApical Index(PAI), CBCTPAI
6. Endodontic microbiology, Endodontic biofilm, E faecalis and persistent apical periodontitis
7. Infection control procedures used in Endodontics (aseptic techniques such as rubber dam, sterilization of instruments etc.)
8. Endodontic emergencies and management.
9. Instruments, Materials and Devices – Hand, Rotary, NiTi in Endodontics – Metallurgy, Shape memory, Superelasticity, Thermomechanical treatment, M-wire, R-wire, CM wire, Max wire.
10. Access cavity preparation – objectives and principles
11. Endodontic instruments and instrumentation – recent developments, detailed description of hand, rotary, sonic, ultra sonic, reciprocating, SAF, etc.
12. Working length determination, Methods, Electronic apex locators
13. Cleaning and Shaping of root canal system- guidelines, assessment of canal curvature, coronapical and apicocoronal techniques of canal preparation, special and recent techniques of cleaning & shaping
14. Root canal irrigants and intra canal medicaments.
15. Irrigation materials, recent advances, Irrigant activation methods, Photodisinfection, Intracanal disinfection materials
16. Obturation materials, techniques, Delivery systems, Root canal sealers, and recent advances.
17. Traumatic injuries and management – classification, Complicated and Uncomplicated crown fracture, crown root fracture, root fracture, Luxation injuries, Avulsion, Storage media, Splinting of teeth, healing of tooth fractures
18. Endodontic surgeries, recent developments in technique and devices and wound healing.
19. Endoperio interrelationship and management –portals of communication, classification,

- Differential diagnosis, Treatment alternatives.
20. Lasers in Endodontics.
 21. Multidisciplinary approach to endodontic situations.
 22. Radiology and CBCT in endodontic practice, Radiographic interpretation.
 23. Procedural errors in endodontics and their management.
 24. Endodontic Failure and Treatment - Criteria for evaluating treatment results, Extent and causes of endodontic failures
 25. Endodontic retreatment - rationale, nonsurgical and surgical retreatment,
 26. coronal disassembly, removal of obturation materials, separated instrument removal, post removal, locating missed canals .
 27. Tooth whitening modalities for discoloured Vital and Pulpless teeth - Case selection,
 28. In office bleaching of vital teeth, Night guard vital bleaching, Bleaching pulpless teeth, Intracoronal bleaching of pulpless teeth, Walking Bleach technique, Alternatives to bleaching, Complications and management
 29. Fracture mechanics: Cracked and Fractured cusps, Cracked and split tooth, Vertical root fracture
 30. Resorptions – Internal, External, Cervical, and its management. Role of Osteoclast, Ankylosis
 31. Microscopes and Microsurgery in endodontics.
 32. Single visit endodontics, current concepts and controversies.
 33. Vital Pulp Therapy – Direct, Indirect, Partial pulpotomy, MTA
 34. Pre and Post Endodontic Restorations - Materials, concepts, procedures.
 35. Anatomical, biological and mechanical considerations for post endodontic restorations. Post and cores- materials, types, fabrication
 36. Paediatric and Geriatric Endodontics
 37. Regenerative Endodontics - Pulp Regeneration, Stem cells, Scaffolds and Growth factors, Revascularization
 38. Nanoparticles in Endodontics - endodontic disinfection, irrigants, medicaments, sealers, obturating materials, biofilm elimination, endodontic posts
 39. Evaluation of endodontic treatment – Radiographic assessment, Evidence based outcome evaluation

Paper-III: Essays (descriptive and analyzing type questions)

TEACHING / LEARNING ACTIVITIES:

The post graduate is expected to complete the following at the end of :

The following is the minimum requirement to be completed before the candidate can be considered eligible to appear for the MDS Part I exam.

First Year MDS

Pre Clinical Work – Conservative Dentistry and Endodontics

1. Exercises on Plaster Models

1.1. For Amalgam Restorations

- 1.1.1. Class II cavity, MO with distal pit and palatal extension on 16.
- 1.1.2. Class II MOD cavity with distal cusp capping on 36.
- 1.1.3. Class II distal cavity on 36.

1.2. For Cast Restorations

- 1.2.1. Class II Preparation on 36 .
- 1.2.2. Onlay preparation with missing buccal cusps on 36

1.3. For Acid – Etch Restorations

- 1.3.1. Class III typical cavity on 11
- 1.3.2. Class III with lingual wall missing on 11
- 1.3.3. Class IV with both line angles missing on 11

2. Exercises On Typodont

2.1. Class II amalgam

- 2.1.1. Conservative MO on 16
- 2.1.2. Conservative DO on 46
- 2.1.3. Conventional MO on 26
- 2.1.4. Conventional DO on 36

2.2. Inlay cavity preparations

- 2.2.1. MO on 36
- 2.2.2. MO on 46
- 2.2.3. DO on 16
- 2.2.4. DO on 26

2.3. Wax patterns

- 2.3.1. DO 16
- 2.3.2. DO 26
- 2.3.3. MO 36
- 2.3.4. MO 46

2.4. Inlay casting

- 2.4.1. Class II inlay on maxillary molar
- 2.4.2. Class II inlay on mandibular molar

2.5. Onlay on molars

- 2.5.1. Onlay preparation
 - 2.5.1.1. Mandibular first molar

- 2.5.2. Onlay to be processed
 - 2.5.2.1. Mandibular first molar

2.6. Full crowns

- 2.6.1. Anterior teeth
 - 2.6.1.1. Maxillary central incisor
 - 2.6.1.2. Maxillary lateral incisor
 - 2.6.1.3. Maxillary canine
 - 2.6.1.4. Mandibular lateral incisor
 - 2.6.1.5. Mandibular canine
- 2.6.1.2. Posterior teeth
 - 2.6.1.2.1. Maxillary first premolar
 - 2.6.1.2.2. Maxillary second premolar
 - 2.6.1.2.3. Maxillary first molar
 - 2.6.1.2.4. Mandibular first premolar
 - 2.6.1.2.5. Mandibular first molar
- 2.6.1.3. Crowns to be processed
 - 2.6.1.3.1. Maxillary central incisor
 - 2.6.1.3.2. Maxillary lateral incisor
 - 2.6.1.3.3. Maxillary first molar
 - 2.6.1.3.4. Mandibular first molar

2.7. Rubber dam exercises on Typhodont teeth

- 2.7.1. Rubber dam placement on single tooth
 - 2.7.1.1. Maxillary anterior
 - 2.7.1.2. Maxillary Molar
 - 2.7.1.3. Mandibular molar
- 2.7.2. Rubber dam placement
 - 2.7.2.1. Maxillary quadrant
 - 2.7.2.2. Mandibular quadrant
- 2.7.3. Rubber dam placement on broken down tooth
- 2.7.4. Split dam technique

3. Full tooth wax carving – all permanent teeth

4. Exercises on natural teeth

4.1. Inlay preparation.

- 4.1.1. Maxillary molar – Mesio- Occlusal
- 4.1.2. Maxillary molar – Disto -Occlusal
- 4.1.3. Mandibular Molar – Mesio- Occlusal
- 4.1.4. Mandibular Molar – Disto- Occlusal
- 4.1.5. Wax Pattern
 - 4.1.5.1. Maxillary molar – Mesio- occlusal
 - 4.1.5.2. Mandibular Molar – Mesio Occlusal
- 4.1.6. Casting
 - 4.1.6.1. Class II inlay on maxillary molar
 - 4.1.6.2. Class II inlay on mandibular molar

4.2. Amalgam preparation

- 4.2.1. Class II conventional preparation & amalgam restoration on maxillary molar
- 4.2.2. Class II conservative preparation & amalgam restoration on maxillary molar
- 4.2.3. Class II conventional preparation & amalgam restoration on mandibular molar
- 4.2.4. Class II conservative preparation & amalgam restoration on mandibular molar

4.3. Pin retained amalgam restoration

- 4.3.1. Maxillary molar
- 4.3.2. Mandibular molar

4.4. Post and Core

- 4.4.1. Anterior teeth
 - 4.4.1.1. Direct post and core build up (Resin/Fiber Post & aesthetic core)
 - 4.4.1.1.1. Maxillary centrals – 1
 - 4.4.1.1.2. Maxillary canine – 1
 - 4.4.1.1.3. Mandibular lateral – 1
 - 4.4.1.1.4. Fabricate a temporary crown on maxillary central incisor
 - 4.4.1.2. Indirect post and core – wax pattern
 - 4.4.1.2.1. Maxillary central
 - 4.4.1.2.3. Maxillary canine
 - 4.4.1.2.5. Mandibular canine
 - 4.4.1.3. Posterior teeth – Indirect post & core - wax pattern
 - 4.4.1.3.1. Maxillary first premolar
 - 4.4.1.3.2. Maxillary first molar
 - 4.4.1.3.3. Mandibular first molar
 - 4.4.1.3.4. Fabricate a temporary crown on maxillary first molar
 - 4.4.1.4. Casting
 - 4.4.1.4.1. Anterior post and core
 - 4.4.1.4.2. Maxillary central
 - 4.4.1.4.3. Mandibular canine
- 4.4.2. Posterior post and core
 - 4.4.2.1. Mandibular molar

4.5. Onlay on molars

- 4.5.1. Onlay preparation
 - 4.5.1.1. Maxillary first molar
 - 4.5.1.2. Mandibular first molar
- 4.5.2. Onlay casting
 - 4.5.2.1. Onlay prepared on Mandibular first molar
 - 4.5.2.2. Veneers on anterior teeth (Indirect method)
- 4.5.3. Full veneer on maxillary central incisor (window design)
- 4.5.4. Full veneer with incisal lapping on maxillary central incisor (incisal lap design)

4.7. Composite Inlay

- 4.7.1. Class II composite inlay preparation
 - 4.7.1.1. Class II DO on maxillary first premolar
 - 4.7.1.2. Class II MO on maxillary first molar
 - 4.7.1.3. Class II MO on mandibular first molar

4.7.2. Composite inlay to be processed

4.7.2.1. Class II MO on mandibular first molar

4.8. Midline diastema closure of maxillary incisors

4.9. Composite restorations

4.9.1. Class I

4.9.1.1. Conventional preparation (Box preparation) on maxillary first molar

4.9.1.2. Class I preparation and composite restoration using minimally invasive design (Clark's)

4.9.1.3. Extensive modified preparation on maxillary first molar (splint design)

4.9.2. Class II

4.9.2.1. Conventional preparation on mandibular molar

4.9.2.2. Beveled conventional preparation on maxillary molar

4.9.2.3. Class II preparation and composite restoration using minimally invasive design (Clark's)

4.9.2.4. Extensive modified preparation on mandibular first molar (wraparound design)

4.9.3. Class IV composite restoration

4.9.3.1. Class IV composite using putty index / silicone index

4.9.3.2. Class IV composite restoration with newer matrix systems

4.10. Endocrown preparation on mandibular molar – (1)

4.11. Bridge for missing upper second premolar - (1)

5. Endodontic Preclinical Exercises on Extracted Teeth

5.1. Sectioning of Extracted Teeth

5.1.1. Horizontal Section Showing Pulp Chamber

5.1.1.1. Maxillary Central

5.1.1.2. Maxillary Canine

5.1.1.3. Maxillary First Premolar

5.1.1.4. Maxillary Second Premolar

5.1.1.5. Maxillary First Molar

5.1.1.6. Mandibular Central Incisor

5.1.1.7. Mandibular Canine

5.1.1.8. Mand First Premolar

5.1.1.9. Mandibular Second premolar.

5.1.1.10. Mandibular First Molar

5.1.2. Vertical Section Showing Pulp Chamber and Root Canals

- 5.1.2.1. Maxillary Central Incisor
- 5.1.2.2. Maxillary Canine
- 5.1.2.3. Maxillary First Premolar
- 5.1.2.4. Maxillary Second Premolar
- 5.1.2.5. Maxillary First Molar
- 5.1.2.6. Mandibular Central Incisor
- 5.1.2.7. Mandibular Canine
- 5.1.2.8. Mandibular First Premolar
- 5.1.2.9. Mandibular Second Premolar
- 5.1.2.10. Mandibular First Molar

5.2. Access Cavity Preparations (under magnifying loupe)

- 5.2.1. Maxillary Central Incisor
- 5.2.2. Maxillary Canine
- 5.2.3. Maxillary First Premolar
- 5.2.4. Maxillary Second Premolar
- 5.2.5. Maxillary First Molar
- 5.2.6. Mandibular Central Incisor
- 5.2.7. Mandibular Canine
- 5.2.8. Mandibular First Premolar
- 5.2.9. Mandibular Second Premolar
- 5.2.10. Mandibular First Molar

5.3. Endodontics Exercises on Extracted Teeth (under microscope)

- 5.3.1. Stepback preparation and lateral condensation technique on 16 and 36.
- 5.3.2. Preparation using protaper and 4% taper instruments, & lateral condensation.
- 5.3.3. Crown down preparation and vertical condensation on 11 with Thermoplasticized guttapercha.
- 5.3.4. Section obturated teeth and observe under operating microscope.
- 5.3.5. Separated instrument retrieval using microscope: one maxillary and one mandibular first molar.

(Note : *i. Technique work to be completed in the first four months*

ii. Appropriate books to be referred to acquire knowledge regarding tooth preparation, armamentarium & scientific rationale).

Clinical Work:

A	Composite restorations	30
B	GIC Restorations	30
C	Complex amalgam restorations	05
D	Composite inlay + veneers (direct and indirect)	10
E	Ceramic jacket crowns	05
F	Post and core for anterior teeth	10
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 Applied Basic Sciences, Dental Materials, Conservative Dentistry and Endodontics
- Journal clubs – 5 by each student
- Case discussions – 5 by each student
- Submission of synopsis at the end of 6 months
- Library assignment work
- Internal assessment – theory and clinicals.

The following is the minimum requirement to be completed before the candidate can be considered eligible to appear for the MDS Part II exam, in addition to the minimum requirements for the MDS Part I exams.

Second Year MDS

1	Ceramic jacket crowns	10
2	Post and core for anterior teeth	10
3	Post and core for posterior teeth	05
4	Composite restoration	15
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.	10
8	Anterior RCT (5 using microscope)	30
9	Posterior RCT (5 using microscope)	40
10	Endo surgery performed independently	05
11	Management of Endo – Perio problems	05
12	Angle build up / class IV composite	05
13	Diastema closure	05
14	Composite Veneers	05

- Under graduate teaching program as allotted by the HOD
- Seminars – 5 by each student
- Journal clubs – 5 by each student
- Case discussions – 5 by each student
- Dissertation work
- Prepare scientific paper / poster 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 MDS

Dissertation work to be submitted 6 months before MDS Part II examination.

Clinical work

1	Cast gold /Tooth colored inlay- Onlay, cuspal restoration	10
2	Post and core	20
3	Molar endodontics	50
4	Endo surgery including microscopic endo surgery	05
5	Diastema Closure	05

6	Angle Build up / class IV composite restoration	05
7	Endo retreatment cases preferably using microscopes	05
8	Regenerative endodontics	05
9	All other types of surgeries including crown lengthening, perioesthetics, hemi sectioning, splinting, replantation.	

Presentation of:

- Seminars – 5 by each student
- Journal clubs – 5 by each student
- Case discussions – 5 by each student
- Under graduate teaching program as allotted by the HOD
- Internal assessment – theory and clinical

Library Dissertation: Should be a comprehensive review of the selected topic which should be finalized and approved by the end of the first six months and the same to be submitted at the end of the first year in the department. It should be approved by the guide and certified by the Head of the Department.

Conferences and Publication of Scientific Papers: During the MDS course the student should attend national conferences and attempts should be made to present at least three scientific papers and publish at least two scientific articles in a journal relevant to the speciality.

Minimum Requirements:

1. Seminars - 15
2. Journal Clubs – 15
3. Case Discussions - 15
4. Teaching training programme for under graduate students – lecture and clinical – 10
5. Scientific paper publication in a journal related to the speciality – 2 articles
6. Scientific paper presentation in conference – State/National/Speciality – 3
7. Should attend at least one workshop in dental materials research

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 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.

2.7 Total number of hours

As per the regulations of the DCI.

2.8 Branches if any with definition

Conservative Dentistry and Endodontics

2.9 Teaching learning methods

Method of Training

The training of a postgraduate student shall be full time but graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, case demonstrations, clinics, journal review meetings, and clinical meetings. Every candidate shall be required to participate in the teaching and training programme of undergraduate students and interns. Training should include involvement in laboratory and experimental work, and research studies. Every Institution undertaking Post Graduate training programme shall set up an Academiccell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each specialty in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

Based on the above guidelines for a structured training programme for postgraduate courses, the basic tenets of a successful postgraduate teaching programme, are detailed under the following heads.

- **Formal Lectures** by the faculty on varied subjects including general areas and systems. Both senior and junior faculty can do this. However, the number of these classes should be maintained of low levels to encourage self-learning.
- **Symposia / Seminars** form an integral part of PG learning. A monthly symposium will generate approximate 30-35 symposia / course. These symposia can include department faculty and HODs as chairpersons and maximum involvement of both students and faculty should be ensured.
- **Clinical Discussions** form the core of PG training and can be assigned to various clinical units on rotating basis. However other faculty could also actively participate in the discussion. The

discussions must be 3-4/week. One suggestion is to score the performance of the candidate by a small panel of faculty and convey the scores to the candidate / PG at the end of the session.

▫ **Journal Club /Clinical Club** should be conducted at least once in a week in each postgraduate department. Journal clubs not only imparts new information but also trains the candidate to objectively assess and criticize various articles which come out and should be useful in ensuring evidence based dentistry.

▫ **Guest Lectures** can be integrated into the PG program at least once in a month. Even the retired faculty can be invited for delivering the lectures and will ensure importing of greater wisdom to the candidates.

▫ **Orientation Classes** for newcomers should also be incorporated. These classes can even be assigned to junior faculty/senior PGs.

▫ **Clinical posting.** Each PG student should work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by a specialist.

▫ **Clinico Pathological Conferences** should be held once a year involving the faculties of Oral Medicine and Radiology, Oral Pathology and concerned clinical department. The student should be encouraged to present the clinical details, radiological and histopathological interpretations and participation in the discussions.

▫ **Rotation postings** in other departments should be worked out by each department in order to bring in more integration between the specialty and allied fields.

▫ **Periodical Quiz** can be both informative and entertaining and should be encouraged and planned.

▫ **Computer Training and Internet Applications** are now becoming a must for both faculty and students. These areas should be strengthened as a next step. There can be a sort of internet information club in the departments.

▫ **Conferences/CDEs** – All postgraduate students should be encouraged to attend conferences and CDEs. They should also be asked to present papers wherever appropriate and should be rewarded by assigning scores for them.

▫ **Publication of scientific papers** – It is desirable and advisable to have at least two publications in the State/National/International indexed dental journals.

▫ **Involvement in Teaching Activity** – PG students can be assigned the job of teaching the undergraduate students and these will definitely improve the teaching skills in the postgraduate students.

2.10 Content of each subject in each year

Present in clause 2.6

2.11 No: of hours per subject

Present in clause 2.6

2.12 Practical training

Present in clause 2.6

2.13 Records

Present in clause 2.21

2.14 Dissertation: As per Dissertation Regulations of KUHS

Every candidate pursuing MDS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation. The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions. Every candidate shall submit to the University in the prescribed format a synopsis containing particulars of proposed dissertation work after obtaining ethical clearance from the Institutional Ethical Committee within six months from the date of commencement of the course or before the dates notified by the University. The synopsis shall be sent only through the Principal of the institution. Such synopsis will be reviewed and the dissertation topic will be registered by the university. No change in the dissertation topic or guide/co guide shall be made without prior approval of the University. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects. The dissertation should be written under the following headings:

- i. Introduction
- ii. Aims and Objectives of the study
- iii. Review of Literature
- iv. Methodology
- v. Results
- vi. Discussion
- vii. Conclusion
- viii. Summary
- ix. References

x. Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires, and other annexures. It should be neatly typed (font size 13-Times New Roman or font size 13-Cambria) in 1.5 line spacing on one side of the paper (A4 size, 8.27” x 11.69”) and bound properly. Spiral binding should be avoided. (Refer Section V and VII). The guide, co-guide if any, Head of the Department and the Head of the Institution shall certify the dissertation. For uniformity, it was suggested that the colour of the hard bind of the dissertation for all branches of MDS course in the purview of KUHS shall be dark brown with letters of gold colour. The title, author, and year of study should also be imprinted or embossed on the spine of the book. **Three hard copies and one properly labeled soft copy in a CD (refer Section VII) of the dissertation thus prepared shall be submitted to KUHS on the 29th month of commencement of the course / 31st Oct. of the 3rd academic year, whichever falls first.**

Dissertation should preferably be sent to a minimum of three reviewers / examiners / assessors, of which two shall be from outside the state and one from the affiliated colleges of KUHS. Consent for acceptance for evaluation of dissertation should be obtained from the reviewer/examiner/assessor before the dissertation are dispatched. Proforma for evaluation of dissertation should be sent along with the copies of the dissertation to the reviewers appointed by the university. The proforma should contain all the assessment criteria with the clause – Accepted/ Accepted with modifications/Rejected and reasons for rejection by the examiner. This proforma should be sent back to the University within two weeks / within the date specified after receipt of dissertation. The dissertation may be declared accepted if more than 50% of the reviewers (2 in the case of 3 reviewers) have accepted it. If modifications are to be made as specified, 3 hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted within 30 days to the University which may be sent back to the same examiner/s by the University for Acceptance after a fee has been levied from the candidate. If the dissertation has been rejected by more than 50% of the reviewers (2 in the case of 3 reviewers), the dissertation may be reviewed by an Expert Reviewing Committee comprising of not less than two subject experts, Dean (Research) of KUHS and Guide of the candidate provided the Guide requests for a review, after a fee has been levied from the candidate. If rejected by the Reviewing Committee, the candidate should take up a new topic and undergo all the procedures of submitting the synopsis, fees, IEC clearance, etc as prescribed by the University. The candidate who takes up the new topic can appear only for the subsequent examination.

Approval of dissertation work is an essential precondition for a candidate to appear in

thePart II University examination. Hall tickets for the Part II examination should be issued to the candidate only if the dissertation has been accepted. A candidate whose dissertation has been accepted by the examiners and approved by the University, but who is declared to have failed at the final examination will be permitted to reappear at the subsequent MDS examination without having to prepare a dissertation.

Guide – The academic qualification and teaching experience required for recognition by the University as a guide for dissertation work is as laid down by the Dental Council of India / KUHS.

Co-guide – A co-guide may be included provided the work requires substantial contribution from the same department or a sister department or from another institution recognized for teaching/training by KUHS/DCI. The co-guide should fulfill the academic qualification and teaching experience required for recognition by the University as a co-guide for dissertation work.

Change of Guide – In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

2.15 Specialty training if any

Present in clause 2.6

2.16 Project work to be done if any

Present in clause 2.6

2.17 Any other requirements [CME, Paper Publishing etc.]

Present in clause 2.6

2.18 Prescribed/recommended textbooks for each subject

APPLIED BASIC SCIENCES

SUBJECT	NAME OF AUTHOR	NAME OF BOOK
Anatomy	BD Chaurasia	BD Chaurasia's Human Anatomy
	William, Peter L	Grays Anatomy
Oral Anatomy	Ash, Major M	Wheeler's Dental Anatomy, Physiology and Occlusion
	Sicher, Harry, Du Brull, Llyod	Oral Anatomy
Oral Histology	Bhaskar B.N. Ed	Orban's Oral Histology and Embryology
	Avery, James K	Avery, James K Essentials of Oral Histology and Embryology
Embryology	Sadler	Langmans Medical Embryology

	Inderbeer Singh	Human Embryology
Physiology	Guyton Arthur and John LHall	Text Book of Medical Physiology
	Ganong, William F	Review of Medical Pysiology
Pharmacology	KD Tripathi	Essentials of Medical Pharmacology
	Hardman, Joel G	Goodman and Gillmans pharmacological basis of Therapeutics
Nutrition	Nizel	Nutrition in Preventive Dentistry: Science and Practice
General Pathology	Cotran, Ramzi S and Others	Robbins Pathologic Basis of Disease
	Harsh Mohan	Textbook of Pathology
Oral Pathology	Shaffer, William and Others	Textbook of Oral Pathology
	Neville, Brad W and Others	Oral and Maxillofacial Pathology
Microbiology	Ananthanarayan and Panicker	Textbook of Microbiology
	Lakshman S	Essential Microbiology for Dentistry
Biostatistics	Dr. Symalan	Statistics in Medicine
	Soben Peter	Essentials of Preventive and Community Dentistry
	Sunder Rao and RichardJ.	Introduction to Biostatistics and Research Methods

ENDODONTICS

- | | | |
|---|--------------------------|--------------|
| 1. Cohen's Pathways of the Pulp | Berman & Hargreaves | 11th Edition |
| 2. Ingle's Endodontics | Illan Rotstein | 7th Edition |
| 3. Endodontic Therap | Franklin S. Weine | 7th Edition |
| 4. Grossman's Endodontic Practice | Gopikrishna V | 14th Edition |
| 5. Color Atlas Of Microsurgery In Endodontics | | |
| 6. Endodontic Microsurgery | Syngcuk Kim | |
| 7. Endodontic Surgery | Enrique Merino | |
| 8. Endodontics | | |
| | C R Stockdale | |
| 9. Endodontics | Christopher J. R. Stock, | |
| 10. Essential Endodontology | Kishor Gulabivala And | |
| 11. Text Book Of Endodontics | Richard T. Walker | |
| 12. Textbook Of Endodontics | Mahmoud Torabinejad | |
| 13. Textbook of Endodontology | D Orstavik | |
| 14. Dental Pulp | Mithra Hegde | |
| 15. Problem solving in Endodontics | Garg | |
| 16. Endodontic Microbiology | Bergenholtz | |
| | Hargreaves | |

17. Endodontics Vol.1 & 2

Guttmann Arnado Castelucci
Fouad
Arnado Castelucci

18. Endodontology – An
integrated Biological and
clinical review

Domenico Ricucci, Jose F Siqueira Jr

Conservative Dentistry

1 Sturdevant's Art & Science
of Operative Dentistry

Harald O Heymann
Edward J Swift
Jr Andre V Ritter

7th edition

2 Summitt's Fundamentals of
Operative Dentistry: A
Contemporary Approach

Thomas J Hilton
Jack L Ferracane
James C Broome

4th edition

3. Operative Dentistry
Modern Theory &
Practice

M A Marzouk

2nd edition

4. Pickard's Manual
of Operative Dentistry

Avijit Banerjee
Timothy F
Walton

9th edition

5. Advanced Operative
Dentistry

Luiz Narciso Baratieri

Dec. 1993

6. Advances in Operative
Dentistry: Volume 1:
Contemporary Clinical
Practice

Jean-Francois Roulet

Aug. 2001

7. Advances in Operative
Dentistry: Volume 2:
Challenges of the Future

Jean-Francois Roulet

Oct. 2001

8. Decision Making
in Operative Dentistry

Paul A. Brunton

Dec. 2002

9. Failure in the Restored

Michael D. Wise

Jan. 1995

Dentition: Management and Treatment		
10. Minimally Invasive Restorations with Bonding	M Degrange	Jan. 1997
11. Operative Dentistry : A Practical Guide to Recent Innovations (Clinical Sciences in Dentistry)	Hugh Devlin	1 st edition
12. Restorative Dentistry	A. D. Walmsley	June 2002
13. Restorative Dentistry An Integrated Approach	P H Jacobsen	Aug. 1998
14. Clinical Operative Dentistry-	Ramya Raghu	

DENTAL MATERIALS

1. Phillips' Science of Dental Materials	Anusavice K J	11 th Edition
2. Craig's Restorative Dental Materials	John M.	12 th Edition
3. Restorative Dental Materials	Robert G. Craig	12 th Edition
4. Applied Dental Materials	J F McCabe	7 th Edition
5. Clinical Aspects of Dental Materials: Theory Practice and Cases	Marcia Gladwin	2 nd Edition
6. Clinical Aspects of Dental Materials: Theory Practice and Cases	Marcia A Gladwin	3 rd Edition
7. Dental Biomaterials	Bagby	
8. Dental Materials and Their Selection	William J. O'Brien	3 rd Edition
9. Dental Materials: Properties and Manipulation	John M. Powers	9 th edition
10. Introduction to Dental Materials	Richard Van Noort	2 nd Edition
11. Introduction to Dental		

Materials	Richard Van Noort	3 rd Edition
12. Materials in Dentistry Principles and Applications	Jack L Ferracane	2 nd Edition
13. Materials Science for Dentistry	Dr. Brian W. Darvell	9 th Edition
14. Materials Used in Dentistry	S. Mahalaxmi	2 nd edition

2.19 Reference books

As suggested by HOD

2.20 Journals

1. Journal of Endodontics
2. International Endodontic Journal
3. Journal of Operative Dentistry
4. Dental Clinics of North America
5. Dental Materials
6. Endodontics & Dental Traumatology
7. Australian Dental Journal
8. JADA
9. Journal of Dental Research
10. Journal of Restorative & Esthetic Dentistry
11. British Dental Journal
12. Journal of Indian Dental Association
13. Journal of Conservative Dentistry
14. International Dental Journal
15. Journal of Dentistry
16. Journal of Dental Materials

2.21 Logbook

▫ Work Diary / Log Book

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/operations observed/assisted/performed by him/her during the training period right from the point of entry and its authenticity shall be assessed weekly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, procedures and tests performed, seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. A work diary containing all the various treatment done by the candidate in the course of the study should also be maintained. The work diary shall be scrutinized

and certified by both the guide/co guide and Head of the Department and presented in the University practical / clinical examination.

3. EXAMINATIONS

Examinations

Evaluation is a continuous process, which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned MDS programme.

Evaluation is achieved by two processes

- 1) Formative or internal assessment
- 2) Summative or university examinations.

Formative evaluation is done through a series of tests and examinations conducted periodically by the institution. Summative evaluation is done by the university through examination conducted at the end of the specified course.

A candidate registered for MDS course must clear the final examination within six years of the date of admission. The examinations should be so organized that this shall be used as the mechanism to confirm that the candidate has acquired appropriate knowledge, skill and competence at the end of the training that he/she can act as a specialist and/or a medical teacher as per expectation. University examination will be held regularly by KUHS in April-May/October-November every year.

A candidate who wishes to study for MDS in a second specialty should have to take the full course of 3 years in that specialty and appear for examinations.

3.1 Eligibility to appear for exams

Every candidate to become eligible to appear for the **MDS examination** shall fulfill the following requirements

MDS Part I Examination

Attendance

Every candidate shall have fulfilled the attendance prescribed by the University (80%) during **First academic year** of the Postgraduate course.

Library Dissertation

Submission of library dissertation as per the regulations of KUHS is mandatory for a candidate to appear for the university examination.

MDS Part II Examination

Attendance

Every candidate shall have fulfilled the attendance prescribed by the University during **each academic year** of the Postgraduate course. A candidate becomes eligible for writing the University examination only after the completion of 36 months from the date of commencement of the course. The candidates should have completed the training period before the commencement of examination.

Dissertation

Approval of the dissertation is mandatory requirement for the candidate to appear for the Part II University examinations.

Pass in MDS Part I Examination

Every candidate shall have to pass the Part I examination to become eligible to appear for the Part II examination. The candidates shall have to pass the Part-I examination at least six months prior to the Part-II examination.

Progress and Conduct

Every candidate shall have participated in seminars, journal review meetings, symposia, conferences, case presentations, clinics and didactic lectures during each year as designed by the concerned department.

Work Diary and Logbook

Every candidate shall maintain a work diary and logbook for recording his/her participation in the training programmes conducted by the department. The work diary and logbook shall be verified and certified by the Head of the department.

The certification of satisfactory progress by the Head of the Department and Head of the Institution shall be based on checklist given in 5.1 to 5.8..

- **Students should note that in case they do not complete the exercises and work allotted to them within the period prescribed, their course requirements will be considered unfulfilled.**
- **Clinical Records, Work Diaries and Logbooks should be maintained regularly and approved by the guide, duly certified by the Head of the Department.**

3.2 Schedule of Regular/Supplementary exams

The MDS part I examination shall be held at the end of the first academic year and the MDS Part II examination shall be held at the end of the third academic year. The university shall conduct two examinations in a year at an interval of four to six months between two examinations. **Not more than two examinations shall be conducted in an academic year.**

3.3 Scheme of examination showing maximum marks and minimum marks

MDS examination will consist of Theory, Practical / Clinical and Viva-voce and Pedagogy examinations.

Written Examination (Theory) : 400 Marks

The MDS examination shall consist of theory, practical / clinical examination

Theory: There shall be two theory examinations for the MDS course,

Part I Examination – at the end of the first academic year

Part II Examination – at the end of the third academic year

Part-I Examination: Shall consist of one theory paper

There shall be a theory examination in the Basic Sciences of three hours duration at the end of the first academic year of the course. The question papers shall be set and evaluated by the faculty of the concerned speciality. The candidates shall have to secure a minimum of 50% marks in the Basic Sciences paper and shall have to pass the Part-I examination at least six months prior to the final (Part-II) examination.

Part-II Examination: Shall consist of

- (i) **Theory** - three papers, namely:—Paper I, Paper II & Paper III, each of three hours duration.
- (ii) **Practical and Clinical Examination;**
- (iii) **Viva-voce and Pedagogy.**

A candidate who wishes to study in a second specialty, shall have to undergo the full course of three years duration in that specialty.

Theory: (Total 400 Marks)

(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, each of 100 Marks=300 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 (2 x 50 = 100 Marks)

Model Question papers

**MDS Part I Examination
MDS - CONSERVATIVE DENTISTRY AND ENDODONTICS**

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

Time 3 hrs.

(Answer all questions)

Maximum Marks 100

Essay

(10 x 10 = 100 marks)

1. Describe mandibular nerve and discuss in detail its importance in dentistry.
2. Describe the physiology of coagulation, its mechanism and application in dental practice.
3. Discuss the different methods for management of pain in endodontics.
4. Discuss the microbiology of dental caries. Add a note on Anticariogenic materials
5. Describe in detail structure of human dentin with reference to dentinal sensitivity.
6. Regulation of blood glucose level and its importance in clinical practice.
7. Chlorhexidine and its use in restorative dentistry and endodontics.
8. Resin adhesion to enamel and dentin, its clinical implications and challenges.
9. Discuss various sampling methods and statistical analysis in clinical research.
10. Define biocompatibility. Discuss the biocompatibility of tooth colored restorative materials.

**MDS Part II Examinations
MDS Conservative Dentistry and Endodontics
Paper I – Conservative Dentistry**

Time : 3 hours

(Answer all questions)

Maximum Marks 100

Long Essays

(2x 25 = 50 marks)

1. Explain the different types of tooth contacts and contours. How will you attain contacts and contours in class II composite restorations.
2. What are the modern techniques in caries detection? How will you prevent dental caries?

Short essays

(5 x 10 =50 marks)

3. Bleaching of vital teeth
4. Isolation of operating field
5. Golden proportion in aesthetics
6. Advances in minimal invasive dentistry
7. Gingival retraction

**MDS Part II Examinations
MDS Conservative Dentistry and Endodontics
Paper–II Endodontics**

Time 3hours

(Answer all questions)

Maximum Marks 100

Long Essays

(2x 25= 50marks)

1. Write on rationale of endodontic treatment. Add a note on various phases of treatment.
2. Classify traumatic injuries of teeth. Write on management of horizontal root fractures.

Short Essays

(5 x 10 = 50marks)

3. Recent advances in endodontic irrigants
4. Materials used to repair root perforations
5. Management of cervical resorption
6. Laser Doppler Flowmetry
7. Lasers in endodontics

**MDS Part II Examinations
MDS Conservative Dentistry and Endodontic
Paper III – Essay question with emphasis on Recent advances in
Conservative Dentistry and Endodontics**

Time: 3 hours

(Answer any TWO questions) Maximum Marks (2 x 50 = 100)

1. Recent Advances in Dentin Bonding. (50marks)
2. Biofilm in Endodontics. (50 marks)
3. Irrigant agitation techniques in endodontics (50 marks)

**Practical Examination:200 marks
Viva voce : 100 Marks**

Written Examination (Theory)

There shall be two theory examinations for the MDS course.

Part-I: Basic Sciences Paper - 100 Marks

The Part I examination consists of one theory paper in Basic Sciences, of three hours duration and shall be conducted at the end of the first academic year of the MDS course.

Part II (Final) Theory examination:300 Marks

The Part II theory examination shall be conducted at the end of Third year of MDS course and consist of three papers, each of three hours duration. Each paper shall carry 100 marks. The type of questions in the first two papers will be two long essay questions carrying 25 marks each and five short essay questions each carrying ten marks. There will be no options in the questions in the first 2 papers. Third paper will be an essay question paper with three essay questions carrying 50 marks each and the candidate is to answer any two of the essays.

Questions on recent advances may be asked in any or all the papers. The syllabus for the theory papers of the concerned specialty should cover the entire field of the subject. Though the topics assigned to the different papers are generally evaluated under designated papers, 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. The theory examinations shall be held sufficiently earlier than the practical/clinical examinations to facilitate evaluation of the answer books can.

The total marks for the Part II theory examination shall be 300.

Practical Examination ; 200 Marks

In case of practical examination, it should aim at assessing competence and skills of techniques and procedures. It should also aim at testing student's ability to make relevant and valid observations, interpretation and inference of laboratory or experimental or clinical work relating to his/her subject for undertaking independent work as a specialist. The total mark for practical/clinical examinations shall be 200.

Viva voce : 100 Marks

Viva voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The candidate may be given a topic for the pedagogy in the beginning of the clinical examination and asked to make a presentation on the topic for 8-10minutes. The total marks shall be 100 of which 80 would be for the viva voce (20 marks/examiner) and 20 marks for the pedagogy.

Scheme of Examination

1. Theory / Written Examination

Theory : (Total :400 Marks)

There shall be two theory examinations for the MDS course,

Part I Examination – at the end of the first academic year

Part II Examination –at the end of the third academic year

Clinical Exercise III - Posterior Class II Composite Restoration - 30 Marks

Day 1

Forenoon

- Exercise I – Random case discussion of two (2) cases (Diagnosis, Treatment planning & discussion)
- Exercise II- Tooth preparation for cast post and core and direct wax pattern
- Evaluation of preclinical exercises, clinical records and other academic activities

After noon

- Exercise III – Posterior Class II Composite Restoration.

Day II

Forenoon

- Gingival retraction and Impression taking after cementation of post and core.
- Exercise IV- Rubber dam placement, access cavity preparation, pulp extripation, working lengthdetermination, pulp space preparation and master cone radiograph – on molar tooth.

After noon

- Viva voce (including presentation of dissertation / pedagogy).

MARK DISTRIBUTION OF PRACTICAL EXAMINATION & VIVA- VOCE

Practical / Clinical Examination- 200Marks

1. Evaluation of preclinical exercises, clinical records, other academic activities and overall performance during the course **25 marks**

2. Clinical procedures

2.1. Random case discussion – (2) 1 endodontic & 1 Restorative) (10+10 =20 Marks)

2.2. Cast Post and Core	50 marks
a. Case presentation and treatment plan	10 marks
b. Evaluation of post space preparation	10 marks
c. Coronal preparation	10 marks
d. Wax pattern	10 marks
e. Gingival retraction and impression	10 marks

2.3. Molar RCT **75 marks**

a. Case presentation and treatment plan	10 marks
b. Isolation and fluid control	15 marks
c. Access cavity preparation	15 marks
d. Working length determination	10 marks
e. Pulp space preparation	15 marks
f. Master Cone Selection	10 marks

2.4. Posterior/ Class II Composite restoration **30 marks**

a. Case presentation and treatment planning	05 marks
b. Isolation and fluid control	05 marks
c. Tooth preparation	10 marks
d. Matricing and wedging	05 marks
e. Restoration	05 marks

Viva Voce **100 Marks**

i. Viva-Voce examination:	80 marks
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All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills.

ii. Pedagogy / Dissertation presentation	20 marks
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4. INTERNSHIP

Not applicable for PG Courses

5.ANNEXURES
5.1 Check Lists for Monitoring: Log Book, Seminar Assessment etc.

Checklist
1

Model Checklist for Evaluation of Preclinical Exercises

Name of Student:

Date:

Name of the Faculty: Name of Exercise:

Sl. No:	Items for observation during evaluation	Score
1	Quality of Exercise	
2	Ability to answer questions	
3	Punctuality in submission of exercise	
4	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty

5.2 :Checklist 2

Model Checklist for Evaluation of Journal Review / Seminar Presentation

Name of Student:

Date:

Name of the Faculty:

Name of Journal / Seminar:

Sl. No:	Items for observation during evaluation	Score
1	Relevance of Topic	
2	Appropriate Cross references	
3	Completeness of Preparation	
4	Ability to respond to questions	
5	Effectiveness of Audio-visual aids used	
6	Time Scheduling	
7	Clarity of Presentation	
8	Overall performance	
	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty

5.3 :Checklist 3

Model Checklist for Evaluation of Clinical Case and Clinical Work

Name of Student:

Date:

Name of the Faculty:

Sl. No:	Items for observation during evaluation	Score
1	History	
	Elicitation	
	Completeness	
2	Examination	
	General Examination	
	Extraoral examination	
	Intraoral examination	
3	Provisional Diagnosis	
4	Investigation	
	Complete and Relevant	
	Interpretation	
5	Diagnosis	
	Ability to defend diagnosis	
6	Differential Diagnosis	
	Ability to justify differential diagnosis	
7	Treatment Plan	
	Accuracy	
	Priority order	
8	Management	
9	Overall Observation	
	Chair side manners	
	Rapport with patient	
	Maintenance of Case Record	
	Quality of Clinical Work	
	Presentation of Completed Case	
10	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty

5.4 :Checklist 4

Model Checklist for Evaluation of Library Dissertation Work

Name of Student:

Date:

Name of the Faculty/Guide:

Sl. No:	Items for observation during evaluation	Score
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide	
7	Completeness of Preparation	
8	Ability to respond to questions	
9	Quality of final output	
	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty

5.5 : Checklist 5

Model Checklist for Evaluation of Dissertation Work

Name of Student:

Date:

Name of the Faculty/Guide/Co-guide:

Sl. No:	Items for observation during evaluation	Score
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide/co-guide	
7	Depth of analysis/Discuss	
8	Ability to respond to questions	
9	Department Presentation of findings	
10	Quality of final output	
	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty

5.6 CHECKLIST - 6

**CONTINUOUS EVALUATION OF
DISSERTATION WORK BY GUIDE/CO-GUIDE**

Name of the Trainee:

Date:

Name of the Faculty

SI.No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1	Periodic consultation with guide / co- guide					
2	Regular collection of case material					
3	Depth of Analysis / Discussion					
4	Department presentation of findings					
5	Quality of final output					
6	Others					
	TOTAL SCORE					

Signature of the guide/co-guide

5.7 : CHECKLIST - 7

OVERALL ASSESSMENT SHEET

Name of the College:

Date:

Name of Department:

Check List No	PARTICULARS	Name of trainee		
		First Year	Second Year	Third Year
1	Preclinical Exercises			
2	Journal Review Presentation			
3	Seminars			
4	Library dissertation			
5	Clinical work			
6	Clinical presentation			
7	Teaching skill practice			
8	Dissertation			
	TOTAL			

Signature of HOD

Signature of Principal

The above overall assessment sheet used along with the logbook should form the basis for certifying satisfactory completion of course of study, in addition to the attendance requirement.

Key:

Mean score: Is the sum of all the scores of checklists 1 to

5.8 LOG BOOK

DEPARTMENT OF

MDS programme

LOG BOOK OF

NAME.....

BIODATA OF THE CANDIDATE

EXPERIENCE BEFORE JOINING P.G. COURSE

DETAILS OF POSTING :

- **FIRST YEAR**
- **SECOND YEAR**
- **THIRD YEAR DETAILS**

OF LEAVE AVAILED

PRECLINICAL EXERCISES

LIBRARY DISSERTATION

RESEARCH WORK

PARTICIPATION IN CONFERENCES – CDE

PROGRAMMES DETAILS OF PARTICIPATION IN

ACADEMIC PROGRAMMESEMINARS /SYMPOSIA

PRESENTED

JOURNAL CLUBS

TEACHING ASSIGNMENTS – UNDERGRADUATES / PARAMEDICAL.

SPECIAL DUTIES (IF ANY)

INTERNAL ASSESSMENT

DAILY ACTIVITIES RECORD (BLANK

PAGES)ONE PAGE FOR EACH MONTH X 36

PAGES MISCELLANEOUS

SUMMARY

5.8.3:LOG BOOK - 3

DIAGNOSTIC AND OPERATIVE PROCEDURES PERFORMED

Name

Admission

Year:College:

Date	Name	OP No.	Procedure	Category 0, A, PA, PI

Key:

O- WASHED UP AND OBSERVED - INITIAL 6 MONTHS OF ADMISSION

A - ASSISTED A MORE SENIOR SURGEON -1 YEAR MDS

PA - PERFORMED PROCEDURE UNDER THE DIRECT SUPERVISION OF A SENIOR SURGEON - II YEAR MDS

PI - PERFORMED INDEPENDENTLY - III YEAR MDS

Signature of the guide / co-guide

Annexure : 5.9

Faculty

a. In each department there should be a minimum required full time faculty members belonging to the disciplines concerned with requisite postgraduate qualification and experience for being a PG teacher as prescribed by the DCI. The requirements of the faculty should follow the norms framed by the DCI.

b. To strengthen and maintain the standards of postgraduate training, DCI and KUHS recommends the following minimum faculty requirements (Table 1) for starting and continuation of postgraduate training programmes. Any increase of admissions will also be based on the same pattern.

Table 1: Minimum Faculty Requirements

Unit 1

1. Minimum faculty requirement of 1st Unit in an undergraduate institute having basic infrastructure of 50 admissions

Department / Speciality	Professor (HOD)	Readers/ Associate Professors	Lecturers/Assistant Professor
Prosthodontics and Crown & Bridge	1	3	4
Conservative Dentistry and Endodontics	1	3	4
Periodontology	1	2	2
Orthodontics & Dentofacial Orthopedics	1	2	2
Oral & Maxillofacial Surgery	1	2	2
Oral & Maxillofacial Pathology and Oral Microbiology	1	2	2
Oral Medicine & Radiology	1	2	2
Pediatric Dentistry	1	2	2
Public Health Dentistry	1	2	2

2. Minimum faculty requirement of 1st Unit in an undergraduate institute having basic infrastructure of 100 admission

Department / Speciality	Professor (HOD)	Readers/ Associate Professors	Lecturers/Assistant Professor
Prosthodontics and Crown & Bridge	1	3	6
Conservative Dentistry and Endodontics	1	3	6
Periodontology	1	3	3
Orthodontics & Dentofacial Orthopedics	1	2	3
Oral & Maxillofacial Surgery	1	3	3
Oral & Maxillofacial Pathology and Oral Microbiology	1	2	3
Oral Medicine & Radiology	1	2	3
Pediatric Dentistry	1	2	3
Public Health Dentistry	1	2	3

3. Unit 2 :-

Each department shall have the following additional teaching faculty, over and above therequirement of Unit 1.

Professor	1
Reader /Associate Professor	1
Lecturer / Assistant Professor	2

- a. In addition to the faculty staff mentioned above there should be adequate strength of Senior Lecturers/ Lecturers available in the department. The department should also have adequate number of technical and other paramedical staff as prescribed by the Dental Council of India.
- b. A department which does not have a Professor and an Assistant Professor with requisite qualifications and experience as laid down by the DCI, shall not start a postgraduate. course in that specialty.
- c. Faculty who is accepted as Postgraduate teacher in a dental institute starting MDS course will not be accepted for the next one year in any other dental institute.

Clinical / Laboratory Facilities and Equipment

There should be adequate clinical material, space and sufficient number of dental chairs and units, adequate laboratory facilities and should regularly be updated keeping in view the advancement of knowledge and technology and research requirements. The department should have the minimum number of all equipment including the latest ones necessary for the training and as recommended by the DCI/KUHS for each specialty from time to time.