

SYLLABUS

MDS - CONSERVATIVE DENTISTRY AND ENDODONTICS (9530)

Notice

1. Amendment made by the Statutory Regulating Council i.e. Dental Council of India in Rules/Regulations of Post Graduate Dental Courses shall automatically apply to the Rules/Regulations of the Mahatma Gandhi University of Medical Sciences & Technology (MGUMST), Jaipur.
2. The University reserves the right to make changes in the syllabus/books/guidelines, fees-structure or any other information at any time without prior notice. The decision of the University shall be binding on all.
3. The Jurisdiction of all court cases shall be Jaipur Bench of Hon'ble Rajasthan High Court only.

RULES & REGULATIONS
MASTER OF DENTAL SURGERY
(3 Years Post Graduate Degree Course)

TITLE OF THE COURSE:

It shall be called Master of Dental Surgery

ELIGIBILITY:

- A candidate for admission to the Master in Dental Surgery course, must possess a degree of Bachelor in Dental Surgery awarded by a University or Institute in India recognized by the Dental Council of India and registered with the State Dental Council and has obtained provisional or permanent registration and has undergone compulsory rotator internship of a year in an approval / recognized dental college.
- In the case of a foreign national, the following procedure shall be followed :
The Council may, on payment of the prescribed fee for registration, grant temporary registration for the duration of the post-graduate training restricted to the dental college / institution to which he or she is admitted for the time being exclusively for post-graduate studies: The temporary registration to such foreign national shall be subject to the condition that such person is duly registered as medical practitioner in his/ her own country from which he/she has obtained his/her basic dental qualification and that his/her degree is recognized by the corresponding state dental council or concerned authority.
- **NRI Seats:**
 - (a) Students from other countries should possess passport, visa and exchange permits valid for the period of their course of study in this institution and should observe the regulations of both central and state governments regarding residential permits and obtain no-objection certificate from the same.
 - (b) The candidate should have a provisional "Student Visa". If he comes on any other visa and is selected for admission, he will have to first obtain a student visa from his country and then only he will be allowed to join the course. Therefore it is imperative to obtain provisional student visa before coming for counselling.
 - (c) This clause is applicable to NRI/ Foreign students only.

CRITERIA FOR SELECTION FOR ADMISSION:

There shall be uniform NEET for admission to the post-graduate dental courses in each academic year conducted in the manner, as prescribed by the National Board of Examination or any other authority appointed by the Central Government in this behalf.

- **NRI Quota**
15% of total seats are earmarked for foreign national/PIO/OCI/NRI/Ward of NRI/NRI sponsored candidates who would be admitted on the basis of merit obtained in NEET MDS or any other criteria laid down by Central Government/DCI.
- **Remaining seats (Other than NRI Quota seats)**
 - (a) Admissions to the remaining 85% of the seats shall be made on the basis of the merit obtained at the NEET conducted by the National Board of Examinations or any other authority appointed by Government of India for the purpose.
 - (b) The admission policy may be changed according to the law prevailing at the time of admission.
- **Qualifying Criteria for Admission:**
 - (a) The candidate has to secure the following category-wise minimum percentile in NEET-MDS Examination for admission to post-graduate courses held in a particular academic year.

General	50th Percentile
Person with locomotory disability lower limbs	45th Percentile
Scheduled Caste, Scheduled Tribes, Other Backward Classes	40th Percentile

The percentile shall be determined on the basis of highest marks secured in the All-India common merit list in NEET-MDS for post-graduate courses: Further, when sufficient number of candidates in the respective categories fail to secure minimum marks as prescribed in NEET-MDS held for any academic year for admission to post-graduate courses, the Central Government in consultation with the Council may, at its discretion lower the minimum marks required for admission to post-graduate courses for candidates belonging to respective categories and marks so lowered by the Central Government shall be applicable for the said academic year only.

- (b) The reservation of seats in dental college/institutions for respective categories shall be as per applicable laws prevailing in States / Union territories. An all India merit list as well as State wise merit list of the eligible candidates shall be prepared on the basis of the marks obtained in NEET-MDS Test and candidates shall be admitted to post-graduate course from the said merit list only. In determining the merit of candidates who are in service of Government / public authority, weightage in the marks may be given by the Government / competent authority as an incentive upto 10% of the marks obtained for each year of service in remote and/or difficult areas upto the maximum of 30% of the marks obtained in NEET-MDS. The remote and difficult areas shall be as defined by State Government / competent authority from time to time.
- (c) A candidate who has failed to secure the minimum percentile as prescribed in these regulations, shall not be admitted to any post-graduate courses in any academic year.
- (d) Minimum 5% seats of the annual sanctioned intake capacity shall be filled up by candidates with locomotory disability of lower limbs between 50% to 70%: In case any seat in this quota remains unfilled on account of unavailability of candidates with locomotory disability of lower limbs between 50% TO 70% then any such unfilled seat shall be filled up by persons with locomotory disability of lower limbs between 40% to 50 – before they are included in the annual sanctioned seats for general category candidates: This entire exercise shall be completed by each dental college / institution as per the statutory time schedule for admission.

ENROLMENT AND ELIGIBILITY:

Every candidate who is admitted to MDS course in Mahatma Gandhi Dental College & Hospital shall be required to get himself/herself enrolled with the Mahatma Gandhi University of Medical Sciences & Technology after paying the prescribed eligibility and enrolment fees.

The candidate shall have to submit an application to the MGUMST for the enrolment/eligibility along with the following original documents with the prescribed fees (upto November 30 of the year of admission without late fees and upto December 31 of the year of admission with late fees) –

- (a) BDS pass degree certificate issued by the University.
- (b) Marks cards of all the university examinations passed (I to Final BDS).
- (c) Attempt Certificate issued by the Principal.
- (d) Certificate regarding the recognition of the Dental College by the Dental Council of India.
- (e) Completion of paid Rotatory Internship certificate from a recognized dental college.
- (f) Registration by any State Dental Council.
- (g) Migration certificate issued by the concerned university.

(h) Proof of SC/ST or other reserve category, as the case may be.

REGISTRATION:

Every candidate who is admitted to MDS course in Mahatma Gandhi Medical College & Hospital shall be required to get himself/herself registered with the Mahatma Gandhi University of Medical Sciences & Technology after paying the prescribed registration fees.

The candidate shall have to submit an application to the MGUMST for registration with the prescribed fees (upto November 30 of the year of admission without late fees upto December 31 of the year of admission with late fees).

DURATION OF THE COURSE:

The Course will commence on 1st May of each academic year and 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 Mahatma Gandhi University of Medical Sciences & Technology, Jaipur and recognized by the Dental Council India.

METHOD OF TRAINING:

- The period of training for the award of MDS course shall be of three years duration for three academic years as full time candidates in an institution including the period of examination:

Provided that the time period required for passing out of the MDS course shall be a maximum of six years from the date of admission in said course:

Provided further that the duration of the post graduate course for the post graduate Diploma holders shall be the same as MDS Course in the concerned speciality except that they are not required to (i) to undergo study and training in Basic Sciences (ii) pass the PART-I examination of MDS course. However, they have to submit the dissertation work, as part of the post graduate programme.

- During the period, each student shall take part actively in learning and teaching activities design of training, by the institution or the university. The teaching and learning activities in each speciality, shall be as under-

- (a) Lectures
- (b) Journal review
- (c) Seminars
- (d) Symposium
- (e) Clinical postings
- (f) Clinico-Pathological conference
- (g) Interdepartmental meetings
- (h) Teaching skills
- (i) Dental education programmes
- (j) Conferences/ Workshops/ Advanced Courses
- (k) Rotation and posting in other Departments
- (l) Dissertation/ Thesis

- All the students of the specialty departments shall complete the minimum quota for the teaching and learning activities, as follows:-

- (a) Journal clubs: 5 in a year
- (b) Seminars: 5 in a year
- (c) Clinical case presentations: 4 in a year
- (d) Lectures taken for undergraduates: 1 in a year

- (e) Scientific paper/ poster presentations in state/ national level conferences: 4 papers/ posters during three years of training workshop period
- (f) Clinic-pathological conferences: 2 presentations during three years of training period.
- (g) Scientific publications (optional) : one publication in any indexed scientific journal
- (h) Submission of synopsis: one synopsis within six months from date of commencement of the course.
- (i) Submission of Dissertation months: one dissertation six months before appearing for the university examination
- (j) Submission of library dissertation: one dissertation within eighteen months from the date of commencement of the course

ATTENDANCE, PROGRESS AND CONDUCT:

- A candidate pursuing MDS course should work in the department of the institution for the full period as a full time student. Every candidate shall secure (80 % attendance during each academic year). No candidate is permitted to run a clinic/work in clinic/laboratory/nursing home/hospital/any similar establishment while studying postgraduate course. No candidate shall join any other course of study or appear for any other examination conducted by this university or any other university in India or abroad during the period of registration. Each year shall be taken as a unit for the purpose of calculating attendance.
- Every candidate shall attend symposia, seminars, conferences, journal review meetings, grand rounds, CPC, case presentation, clinics and lectures during each year as prescribed by the department and not absent himself / herself from work without valid reasons. Every candidate shall have not less than 80 percent of attendance in each year of the course. However, candidates should not be absent continuously as the course is a full time one.

MIGRATION:

Under no circumstances, the migration or the transfer of students undergoing post-graduate Degree/ Diploma shall not be permitted by the university or the authority. No interchange of the specialty in the same institution or in any other institution shall be permitted after the date of commencement of session.

MONITORING PROGRESS OF STUDIES- WORK DIARY / LOG BOOK:

Every candidate shall maintain a work diary in which his/her participation in the entire training programme conducted by the department such as reviews, seminars, etc. has to be chronologically entered. The work scrutinized and certified by the Head of the Department and Head of the Institution is to be presented in the University practical/clinical examination.

- (a) Periodic tests: There shall be three tests; two of them shall be annual tests, one each at the end of first year and the second year. The third test shall be held three months before the final examination; tests shall include written papers, practical/clinical and viva voce.
- (b) Records: Records and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University when called for.

DISSERTATION:

- Every candidate pursuing MDS degree course is required to carry out work on research project under the guidance of a recognized post graduate teacher . Then such a work shall be submitted in the form of a dissertation. The dissertation is aimed to train a

postgraduate student in research methods & techniques. It includes identification of a problem, formulation of a hypothesis, review of literature, getting acquainted with recent advances, designing of a study, collection of data, critical analysis, comparison of results and drawing conclusions.

- Every candidate shall submit to the Registrar of the University in the prescribed format a synopsis containing particulars of proposed dissertation work on or before the dates notified by the University. The synopsis shall be sent through the proper channel. Such synopsis will be reviewed and the dissertation topic will be registered by the University. No change in the dissertation topic or guide shall be made without prior notice and permission from the University.

- The dissertation should be written under the following headings:

- (a) Introduction
- (b) Aims and Objectives of study
- (c) Review of Literature
- (d) Material and Methods
- (e) Results
- (f) Discussion
- (g) Conclusion
- (h) Summary
- (i) References
- (j) Tables
- (k) Annexure

- The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires and other annexure. It should be neatly typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. The guide, head of the department and head of the Institution shall certify the dissertation. Four copies of dissertation thus prepared shall be submitted to the Registrar for evaluation, six months before final examination on or before the dates notified by the University. Examiners appointed by the University shall value the dissertation. Approval of dissertation work is an essential precondition for a candidate to appear in the University examination.

- Guide: The academic qualification and teaching experience required for recognition by this University as a guide for dissertation work is as laid down by Dental Council of India / Mahatma Gandhi University of Medical Sciences & Technology, Jaipur.

- Co-guide: A co-guide may be included provided the work requires substantial contribution from a sister department or from another institution recognized for teaching/training by Mahatma Gandhi University of Medical Sciences & Technology, Jaipur / Dental Council of India. The co-guide shall be a recognized postgraduate teacher of Mahatma Gandhi University of Medical Sciences & Technology, Jaipur.

- 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.

ELIGIBILITY TO APPEAR FOR UNIVERSITY EXAMINATION:

- Eligibility: The following requirements shall be fulfilled by every candidate to become eligible to appear for the final examination.

- (a) **Attendance:** Every candidate shall have fulfilled the attendance prescribed by DCI during each academic year of the postgraduate course. Every candidate shall secure (80 % attendance during each academic year).

- (b) **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 department. The candidate should have exemplified good conduct throughout.
- (c) **Work diary and Logbook:** Every candidate shall maintain a work diary for recording his/her participation in the training programme conducted in the department. The work diary and logbook shall be verified and certified by the Department Head and Head of the Institution.
- (d) Internal assessments shall be held every 6 months.
 - The certification of satisfactory progress by the Head of the Department/ Institution shall be based on (a), (b) and (c) mentioned above.

SCHEME OF MDS EXAMINATIONS:

- The scheme of examination in respect of all the subjects of MDS shall be as under :
- The examinations shall be organised on the basis of marking system.
- Every student during the period of his post graduate studies would be required to submit evidence of the following so as to make him eligible to appear at the final examination of the University :-

(a) Scientific Publication in indexed journal	-	1
(b) Scientific Presentations	-	3
(c) Specialty Conferences/ PG Conventions attended	-	3
- Every student would be required to appear in and qualify the Pre-University examination conducted at the college level .Post graduate students who fail to appear in or do not qualify the Pre-University examination shall not be permitted to appear in the final examination of the University.
- The University shall conduct not more than two examinations in a year for any subject with an interval of not less than 4 months and not more than 6 months between the two examinations.
- The examinations shall consist of Thesis, Theory papers and Clinical/ Practical and Oral examinations.
 - (a) **Thesis** : Thesis shall be submitted at least six months before the Theory and Clinical/ Practical and Oral examinations.
 - (1) The thesis shall be examined by a minimum of three examiners- one Internal and two External examiners.
 - (2) Only on the acceptance of the thesis by two examiners, the candidate shall be eligible to appear for the final examination.
 - (b) **Theory** :
 - (1) Theory exams will be conducted in 2 parts.
 - Part - I – Shall consist of one paper; Applied basic sciences paper at the end of the first year of MDS.The Paper I of Part I shall carry 100 marks. The question paper shall be set and evaluated by the paper setter (external examiner of the recognized university by DCI from out of the state). There shall be 10 questions of 10 marks each. The candidates shall have to secure a minimum of 50% in the basic Sciences and shall have to pass the Part I examination at least 6 months prior to the final (Part II) examination. There shall be one internal and one external examiner for three students appointed by the affiliating university for evaluating the answer scripts of the same speciality. However, the number of examiner/s may be increased with the corresponding increase in the number of students. Answer books shall be evaluated by the internal and external examiner/s and average marks shall be computed.

Part-II - Consisting of 3 papers, out of which 2 will be pertaining to the specialty and one shall be of Essays. Paper I and Paper II shall consist of 2 long answer questions carrying 25 marks each and five questions carrying 10 marks each. In paper III, three questions will be given and student has to answer any two questions. Each question carries 50 marks. There shall be four examiners in each subject. Out of them, two (50%) shall be external examiners and two (50%) shall be internal examiners. Both external examiners shall be from a university other than the affiliating university and one examiner shall be from a university of different state. Answer books shall be evaluated by four examiners, two internal and two external and average marks shall be computed.

(2) Each theory paper examination shall be of three hours duration.

(3) Each theory paper shall carry maximum 100 marks.

(c) Clinical / Practical and Oral Examination

(1) Clinical / Practical (of 200 marks) and Oral Examination (of 100 marks) will be conducted by at least four examiners, out of which two (50%) shall be External examiners who shall be invited from other recognized Universities from outside the State. The practical/ clinical examination in all the specialties shall be conducted for 6 candidates in two days: provided that practical/ clinical examination may be extended for one day, if it is not complete in two days.

(2) A candidate will be required to secure at least 50% (viz. 150/300) marks in the Practical including clinical and viva voce examinations.

- A candidate shall be required to secure at least 50% marks in theory papers and 50% marks in practical (including clinical & viva voce) separately to pass MDS Examination.

GRACE MARKS:

- No grace marks will be provided in MDS examinations.

REVALUATION/SCRUTINY:

- No Revaluation shall be permitted in the MDS examinations. However, the student can apply for scrutiny of the answer books.
- If a candidate fails in MDS Part-II examination in one or more theory paper(s) or practical, he/she shall have to reappear in all theory papers as well as practical.

APPOINTMENT OF EXAMINERS:

- Qualification and experience of Examiners

The qualification and experience for the appointment of an examiner shall be as under:-

- (1) shall possess qualification and experience of Professor in a post graduate degree programme.
- (2) A person who is not a regular post graduate teacher in the subject shall not be appointed as an examiner.
- (3) The internal examiner in a subject shall not accept external examinership in a college for the same academic year.
- (4) No person shall be appointed as an external examiner for the same institution for more than 2 consecutive years. However, if there is a break of one year, the person can be reappointed.

- Criteria for pass certificate

To pass the university examination, a candidate shall secure in both theory examination and in practical/ clinical including viva voce independently with an aggregate of 50% of total marks Allotted (50 out of 100 marks in part I examination and 150 marks out of 300 in part II examination in theory and 150 out of 300, clinical plus viva voce together). A

candidate securing marks below 50% as mentioned above shall be declared to have failed in the examination. A candidate who is declared successful in the examination shall be granted a Degree of Master of Dental Surgery in respective speciality.

CONSERVATIVE DENTISTRY AND ENDODONTICS (9530)

1. GOAL:

The aim of the course is to train a post graduate dental surgeon so as to ensure higher competence in conservative dentistry and Endodontics dealing with the nature of oral diseases, their causes, processes and effects.

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 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 his publishing his work and presenting the same at scientific platform.

Skills:

- Take proper chair side history, examine the patient and perform medical and dental diagnostic procedures as well as perform relevant tests and interpret to 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

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 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. SYLLABUS:

2.1 Theory

Part - I (9531) - Applied Basic Science

(Applied Basic Sciences, Applied Anatomy, Physiology, Pathology including Oral Microbiology, Pharmacology, Biostatistics and Research Methodology and Applied Dental Materials)

Applied Anatomy of Head and Neck

- (1) 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 functions 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.
- (2) Internal anatomy of permanent teeth and its significance
- (3) Applied histology- histology of skin, oral mucosa, connective tissue, bone, cartilage, blood vessels, lymphatics, nerves, muscles, tongue.

Development of Teeth

- (1) Enamel- development and composition, physical characteristics, chemical properties, structure
- (2) Age changes- clinical structure
- (3) Dentin – Development, physical and chemical properties, structure, type of dentin, innervations, age and functional changes.
- (4) Pulp– Development, histological structures, innervations, functions, regressive changes, clinical considerations.
- (5) Cementum- Composition, cementogenesis, structure, functions, clinical considerations.
- (6) Periodontal ligament- Development, structure, functions and clinical considerations.
- (7) Salivary glands- structure, functions, clinical considerations.
- (8) Eruption of teeth.

Applied Physiology

- (1) Mastication, deglutition, digestion and assimilation, fluid and electrolyte balance.
- (2) 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 gland activity and disorders relating to pituitary, thyroid, parathyroid, adrenals including pregnancy and lactation.
- (3) Physiology of saliva- composition, function, clinical significance.
- (4) Clinical significance of vitamins, diet and nutrition- balanced diet.
- (5) 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.
- (6) Metabolism of inorganic elements, detoxification in the body, anti metabolites, chemistry of blood, lymph and urine.

Pathology:

- (1) Inflammation, repair, degeneration, necrosis and gangrene.
- (2) Circulatory disturbances- Ischemia, hyperemia, edema, thrombosis, embolism, infarction, allergy and hypersensitivity reaction.
- (3) Neoplasms- Classifications of tumors, characteristics of benign and malignant tumors, spread of tumors.
- (4) Blood dyscrasias

- (5) 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.
- (6) Bacterial, viral, mycotic infections of the oral cavity.

Microbiology:

- (1) Pathways of Pulpal infection, oral flora and micro organisms associated with endodontic diseases, pathogenesis, host defense, bacterial virulence factors, healing, theory of focal infections, microbes and their relevance to dentistry – streptococi, staphylococci, lactobacilli, corynebacterium, actinomycetes, clostridium, neisseria, vibrio, bacterioids, fusobacteria, spirochetes, mycobacterium, virus and fungi.
- (2) Cross infections, infection control, infection control procedures, sterilization and disinfection.
- (3) Immunology – antigen antibody reaction, allergy, hypersensitivity and anaphylaxis, auto immunity, grafts, viral hepatitis, HIV infections and AIDS. Identification and isolation of microorganisms from infected root canals. Culture medium and culturing technique (Aerobic and anaerobic interpretation and antibiotic sensitivity test).

Pharmacology:

- (1) Dosage and route of administration of drugs, actions and fate of drug in body, drug addiction, tolerance of hypersensitivity reactions.
- (2) Local anesthesia – Agents and chemistry, pharmacological actions, fate and metabolism of anaesthetics, ideal properties, techniques and complications.
- (3) General anesthesia – pre medications, neuro muscular blocking agents, induction agents, inhalation anesthesia, and agents used; assessment of anesthetic problems in medically compromised patients.
- (4) Anaesthetic emergencies
- (5) Antihistamines, corticosteroids, chemotherapeutic and antibiotics, drug resistance, haemostasis, and haemostatic agents, anticoagulants, sympathomimetic drugs, vitamins and minerals (A, B, C, D, E, K, IRON), anti sialogogues, immunosuppressants, drug interactions, antiseptics, disinfectants, anti viral agents, drugs acting on CNS.

Biostatistics:

- (1) 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, Friendmann two way analysis, Regression analysis), Correlation and regression, Use of computers.

Research Methodology:

- (1) Essential features of a protocol for research in humans
- (2) Experimental and non-experimental study designs
- (3) Ethical considerations of research

Applied Dental Materials:

- (1) Physical and mechanical properties of dental materials, biocompatibility.
- (2) Impression materials, detailed study of various restorative materials, restorative resins 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.

- (3) Dental ceramics-Recent advances, finishing and polishing materials.
- (4) Dental burs – Design and mechanics of cutting – other modalities of tooth preparation
- (5) Methods of testing bio-compatibility of materials used.

Part - II Paper I (9532) - 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 Preparation- recent developments (air abrasions, lasers etc)
- (6) Infection control procedures in conservative dentistry, isolation equipments etc.
- (7) Direct concepts in tooth preparation for amalgam, composite, GIC and restorative techniques, failures and management.
- (8) Direct and indirect composite restorations.
- (9) Indirect tooth colored restorations- ceramic, inlays and on lays, veneers, crowns, recent advances in fabrication and materials.
 - (a) Tissue management
- (10) Impression procedures used for indirect restorations.
- (11) Cast metal restorations, indications, contraindications, tooth preparation for class II inlays, on lay, full crown restorations.
 - (a) Restorative technique, direct and indirect methods of fabrication including materials used for fabrication like inlay wax, investment materials
- (12) Direct gold restorations.
- (13) Recent advances in restorative materials and procedures.
- (14) Management of non-carious lesion.
- (15) Advance knowledge of minimal intervention dentistry.
- (16) Recent advances in restoration of endodontically treated teeth and grossly mutilated teeth
- (17) Hypersensitivity, theories, causes and management.
- (18) Lasers in Conservative Dentistry
- (19) CAD-CAM & CAD-CIM in restorative dentistry
 - (a) Dental imaging and its application in restorative dentistry (clinical photography)
- (20) Principles of esthetics
 - (a) Color
 - (b) Facial analysis
 - (c) Smile design
 - (d) Principles of esthetic integration
 - (e) Treatment planning in esthetic dentistry

Part - II Paper II (9533) - Endodontics

- (1) Rationale of endodontics.
- (2) Knowledge of internal anatomy of permanent teeth, anatomy of root apex and its implications in endodontic treatment.
- (3) Dentin and pulp complex.

- (4) Pulp and periapical pathology
- (5) Pathobiology of periapex.
- (6) Diagnostic procedure – recent advances and various aids used for diagnosis
 - (a) Orofacial dental pain emergencies: endodontic diagnosis and management
- (7) Case selection and treatment planning
- (8) Infection control procedures used in Endodontics (aseptic techniques such as rubber dam, sterilization of instruments etc.)
- (9) Access cavity preparation – objectives and principles
- (10) Endodontic instruments and instrumentation – recent developments, detailed description of hand, rotary, sonic, ultra sonic etc.
- (11) Working length determination / cleaning and shaping of root canal system and recent development in techniques of canal preparation.
- (12) Root canal irrigants and intra canal medicaments used including non – surgical Endodontics by calcium hydroxide.
- (13) Endodontic microbiology.
- (14) Obturating materials, various Obturation techniques and recent advances in Obturation of root canal.
- (15) Traumatic injuries and management – endodontic treatment for young permanent teeth. Pediatric Endodontics – treatment of immature apex.
- (16) Endodontic surgeries, recent developments in technique and devices, endosseous endodontic implants – biology of bone and wound healing.
- (17) Endoperio interrelationship, endo + Perio lesion and management
- (18) Drugs and chemicals used in Endodontics
- (19) Endo emergencies and management.
- (20) Restoration of endodontically treated teeth, recent advances.
- (21) Geriatric Endodontics
- (22) Endo emergencies and management
- (23) Biologic response of pulp to various restorative materials and operative procedures.
- (24) Lasers in Endodontics.
- (25) Multidisciplinary approach to endodontics situations.
- (26) Endodontics radiology – digital technology in endodontics practice.
- (27) Local anesthesia in endodontics.
- (28) Procedural errors in endodontics and their management.
- (29) Endodontics failures and re-treatment.
- (30) Resorptions and its management.
- (31) Microscopes in endodontics.
- (32) Single visit endodontic, current concepts and controversies.

Part - II Paper III (9534) - Descriptive and analyzing type question

3. 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.

1st Year

Pre Clinical Work – Conservative Dentistry and Endodontics

Preclinical work on Typhodont teeth

(1)	Class II amalgam cavities	
	(a) Conservative preparation	03
	(b) Conventional preparation	03

(2)	Inlay cavity preparation on premolars and molars – MO, DO, MOD	10
	(a) Wax pattern	06
	(b) Casting	04
(3)	On lay preparation on molars	02
	(a) Casting	01
(4)	Full Crown	
	(a) Anterior	05
	(b) Posterior (2 each to be processed)	05
(5)	7 / 8 crown (1 to be processed)	02
(6)	$\frac{3}{4}$ crown premolars (1 to be processed)	02

Pre Clinical work on Natural teeth:

(1)	Inlay on molars and premolars MO, DO, and MOD	08
	(a) Casting	02
	(b) Wax pattern	02
(2)	Amalgam cavity preparation	
	(a) Conventional	02
	(b) Conservative	02
(3)	Pin retained amalgam on molar teeth	02
(4)	Post and core build up	
	(a) Anterior teeth	10
	(b) Posterior teeth	05
(5)	Casting	
	(a) Anterior	04
	(b) Posterior	02
(6)	On lay on molar (1 to be processed)	03
(7)	Full crown premolars and molars	04
(8)	Full crown Anterior (2 and 3 to be processed)	06
(9)	Veneers Anterior teeth (indirect method)	02
(10)	Composite inlay (class 2) (1 to be processed)	03
(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 down Obturation : 03
- (5) BMP Premolar : 06 (2 upper and 2 lower) obturation 1 each
- (6) BMP Molar : 06 (3 upper – 2 first molar 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

1st year

Clinical Work:

(1) Composite restorations	30
(2) GIC Restorations	30
(3) Complex amalgam restorations	05
(4) Composite inlay + veneers (Direct and indirect)	05
(5) Ceramic jacket crowns	05
(6) Post and core for anterior teeth	05
(7) Bleaching vital	05
Non vital	05
(8) RCT Anterior	20
(9) Endo surgery – observation and assisting	05
(10) Presentation of:	
(a) Seminars -	05
(b) Journal Club -	05
(c) Submission of synopsis at the end of 6 months	
(d) Internal assessment – theory and clinical	

2nd year

(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	
(a) Re-attachment 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
(a) Under graduate teaching program as allotted by the HOD	
(b) Seminars – 5 by each student	
(c) Journal club – 5 by each student	
(d) Case discussion -5	
(e) Dissertation work	
(f) Prepare scientific paper and present in conference and clinical meeting	
(g) Library assignment to be submitted 18 months after starting of the course	
(h) Internal assessment – theory and clinical	

3rd year

Dissertation work to be submitted 6 months before final examination

- **Clinical work**
- Cast gold inlay- Onlay, cuspal restoration 10
- Post and core 20
- Molar endodontics 50

- Endo surgery 05
- Diastema Closure 05
- Angle build up
- All other types of surgeries including crown lengthening, perioesthetics, hemi sectioning, splinting, replantation.

Presentation of:

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

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.

4. SCHEME OF EXAMINATION:

4.1 Theory : Total 400 marks

Part-I : Basic Sciences Paper – 100 Marks

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

- (1) Part-I : examination shall consist of Basic sciences paper of three hours duration and shall be conducted at the end of First year of MDS courses. Paper shall be of 100 marks and there shall be 10 questions of 10 marks each. The 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.
- (2) Part – II Examination shall be conducted at the end of Third year of MDS course and shall consist of Paper-I, Paper-II and Paper –III, each of three hours duration. Paper-I & Paper-II shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Paper – III will be on Essays in which three questions will be given and student has to answer any two questions. Each question carries 50 marks. Questions on recent advances may be asked in any or all the papers.

Nomenclature of Papers

Part - I (9531): Applied Basic Science

(Applied Basic Science, Applied Anatomy, Physiology, Pathology including Oral Microbiology, Pharmacology, Biostatistics and Research Methodology and Applied Dental Materials)

Part - II

Paper I (9532) Conservative Dentistry

Paper II (9533) Endodontics

Paper III (9534) Descriptive and analyzing type question

4.2 Clinical Examination : 200 marks

The duration of Clinical and Viva Voce examination will be 2 days for a batch of four students. If the number of candidates exceeds 4, the programme can be extended to 3rd day.

Day 1

Random case discussion – (2) - 10+10 Marks

Clinical Exercise I – 50 Marks

(Diagnosis, Treatment, Planning & Discussion)

Cast core preparation

- i (i) Tooth Preparation - 20 marks
- ii (ii) Direct Wax Pattern - 10 marks
- iii (iii) Casting - 10 marks
- iv (iv) Cementation - 05 marks
- v (v) Retraction & Elastomeric Impression - 05 marks

Clinical Exercise II - 30 Marks

(Inlay Exercise) - 20 marks

- i (i) Tooth preparation for Class II Inlay (Gold or Esthetic)

- 10 marks

- i (ii) Fabrication of Indirect Pattern

Day 2

Clinical Exercise III - 100 Marks

(Molar Endodontics) - 20 marks

- i (i) Local Anaesthesia and Rubber Dam application

- 20 marks

- i (ii) Access Cavity

- 20 marks

- i (iii) Working length determination

- 20 marks

- i (iv) Canal Preparation

- 20 marks

- i (v) Master cone selection
-20 marks

C. Viva Voce : 100 Marks

i. Viva-Voce examination : 80 marks

All examiners will conduct viva-voce conjointly on candidate's comprehension, analytical approach, expression, interpretation of data and communication skills. It includes all components of course contents. It includes presentation and discussion on dissertation also.

- ii. ***Pedagogy Exercise : 20 marks*** A topic be given to each candidate in the beginning of clinical examination. He/she is asked to make a presentation on the topic for 8-10 minutes.

MODEL PAPER

**M.D.S. Part-I
9531**

Bas.Sci.-I

Master of Dental Surgery Part-I Examination Month Year
CONSERVATIVE DENTISTRY & ENDODONTICS

Applied Basic Sciences

(Applied Basic science, Applied Anatomy, Physiology, Pathology including Oral Microbiology, Pharmacology, Biostatistics and Research Methodology and Applied Dental Materials)

Time: Three Hours
Maximum Marks: 100

Attempt all Questions.

All the parts of one question should be answered at one place in sequential order.
Illustrate your answers with suitable diagrams, wherever necessary.

Q.1	Properties of Noble metal alloys used in Operative Dentistry.	10
Q.2	Muscles of Mastication with applied anatomy and diagrams.	10
Q.3	Impact of Hepatitis B virus in dental profession.	10
Q.4	Biostatistics in Dental Research.	10
Q.5	Balanced diet.	10
Q.6	Deficiency and toxicity symptoms of Fluorides.	10
Q.7	Calcium metabolism	10
Q.8	Classify NSAIDs. Explain four therapeutically useful pharmacological action of Aspirin.	10
Q.9	Describe physiology of coagulation, its mechanism and application.	10
Q.10	Chi-Square test.	10

MODEL PAPER

**M.D.S. Part-II
9532**

Cons.Dentistry.-I

Master of Dental Surgery Part-II Examination Month Year
CONSERVATIVE DENTISTRY AND ENDODONTICS

Paper I
Conservative Dentistry

Time: Three Hours
Maximum Marks: 100

Attempt all Questions.

All the parts of one question should be answered at one place in sequential order.

Illustrate your answers with suitable diagrams, wherever necessary.

- | | | |
|-----|---|---------|
| Q.1 | Discuss Cast Restorations with Respect to their Historical Importance and future prospects | 25 |
| Q.2 | Short Notes
a) Principles of Esthetics
b) CAD-CAM | 25 |
| Q.3 | Short Notes
a) Matrices
b) Amalgam Failures
c) Principles of Esthetics
d) CAD-CAM
e) Management of dentinal hypersensitivity | 5x10=50 |

MODEL PAPER

**M.D.S. Part-II
9533**

Endodon.-II

Master of Dental Surgery Part-II Examination Month Year
CONSERVATIVE DENTISTRY AND ENDODONTICS

Paper II
Endodontics

Time: Three Hours
Maximum Marks: 100

Attempt all Questions.

All the parts of one question should be answered at one place in sequential order.

Illustrate your answers with suitable diagrams, wherever necessary.

- Q.1 Discuss Endodontic Emergencies in detail 25
- Q.2 Enumerate various methods of working length determination. Discuss in detail the evolution of electronic apex locators 25
- Q.3 Short Notes 5x10=50
- (a) Mineral Trioxide Aggregate
 - (b) Calcium Hydroxide in endodontics
 - (c) Role of Smear Layer in Endodontics
 - (d) Vital tooth Bleaching
 - (e) Flap designs in endodontic Surgery

MODEL PAPER

**M.D.S. Part-II
9534**

Essay.-III

Master of Dental Surgery Part-II Examination Month Year
CONSERVATIVE DENTISTRY AND ENDODONTICS

Paper III

Descriptive and analyzing type question

Time: Three Hours
Maximum Marks: 100

Answer any two questions.

All the parts of one question should be answered at one place in sequential order.

Illustrate your answers with suitable diagrams, wherever necessary.

Q.1	Root Canal Irrigation-Techniques & Devices	50
Q.2	Recent Advances in Esthetic Restorative Materials	50
Q.3	Multidisciplinary approach to endodontic situations	50