

SYLLABUS

MDS - ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS (9540)

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 of 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 basics 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 speciality 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.

REVEALUATION/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.

ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS (9540)

1. GOALS:

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

- (1) Practice Orthodontics efficiently and effectively backed by scientific knowledge and skills
- (2) Exercise empathy and caring attitude and maintain high ethical standards

2. OBJECTIVES:

(1) **Knowledge:** At the end of the course the student should be able to:

- (a) Understand dynamic interaction of biologic processes & mechanical forces acting on the stomatognathic system during orthodontic treatment.
- (b) Understand aetiology, pathophysiology, diagnosis & treatment planning of various orthodontic problems.
- (c) Understand various treatment modalities in orthodontics: preventive, interceptive & corrective.
- (d) Know basic sciences relevant to the practice of orthodontics.
- (e) Understand interaction of social, cultural, economic, genetic & environmental factors & their relevance to management of orofacial deformities.
- (f) Demonstrate knowledge of factors affecting the long range stability of orthodontic correction & their management.
- (g) Know importance of personal hygiene & infection control, prevention of cross infection & safe disposal of hospital waste, keeping in view the high prevalence of Hepatitis & HIV & other highly contagious diseases.

(2) **Skills:**

- (a) Obtain proper clinical history, methodical examination of the patient, perform essential diagnostic procedures, and interpret them and arrive at a reasonable diagnosis about the dentofacial deformities.
- (b) Fabricate and manage the most appropriate appliance-intra or extra oral, removable or fixed, mechanical or functional & active or passive – for the treatment of any orthodontic problem to be treated singly or as a part of multidisciplinary treatment of orofacial deformities.

(3) **Attitudes:**

- (a) Develop an attitude to adopt ethical principles in all aspects of orthodontic practice.
- (b) Demonstrate professional honesty & integrity.
- (c) Formulate treatment care irrespective of the social status, cast, creed or colleagues.
- (d) Show willingness to share the knowledge & clinical experience with professional colleagues.
- (e) Show willingness to adopt, after a critical assessment, new methods & techniques of orthodontic management developed from time to time based on scientific research, which are in the best interest of the patient.
- (f) Respect patient's rights & privileges, including patient's right to information & right to seek a second opinion.
- (g) Develop an attitude to seek opinion from allied medical & dental specialists as & when required.

(4) **Communication Skills:**

- (a) Develop adequate communication skills particularly with the patients giving them various options available to manage a particular dentofacial problem & to obtain a true informed consent from them for the most appropriate treatment available at that point of time.

- (b) Develop the ability to communicate with professional colleagues, in orthodontics or other specialities through various media like correspondence, internet, e-video, conference etc. to render the best possible treatment.

3. SYLLABUS:

Spread of the Curriculum

Six months teaching of basic subjects including completion of pre-clinical exercises and 2.5 years of coverage of all relevant topics in Orthodontics, clinical training involving treatment of patients and submission of dissertation.

3.1 Theory

Part-I (9541) - Applied Basic Sciences

(Applied Basic Sciences, Applied Anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology, Applied Research methodology, Biostatistics and applied pharmacology)

Applied Anatomy

- (1) Prenatal growth of the head: Stages of embryonic development, origin of head, face and teeth.
- (2) Post natal growth of the head: Bones of the skull, Oral cavity, development of chin, the hyoid bone, general growth of the head, face growth.
- (3) Bone growth: Origin of bone, composition of bone, units of bone structure, schedule of ossification, mechanical properties of bone and roentgenographic appearance of bone.
- (4) Assessment of growth & development: Growth prediction, growth spurts, the concept of normality and increments of growth, differential growth, gradient of growth, methods of gathering growth data, theories of growth & recent advances, factors affecting physical growth.
- (5) Muscles of mastication: Development of the muscles, muscle change during growth, muscle function & facial development, muscle function & malocclusion.
- (6) Development of dentition & occlusion: Dental development periods, order of tooth eruption, chronology of permanent tooth formation, periods of occlusal development, pattern of occlusion.
- (7) Assessment of skeletal age: The carpal bones, carpal x-rays, cervical vertebrae.

Physiology

- (1) Endocrinology & its disorders: Growth hormone, thyroid gland hormones, parathyroid gland hormones, ACTH, pituitary gland hormones.
- (2) Calcium & its metabolism
- (3) Nutrition metabolism & their disorders: Proteins, carbohydrates, fats, vitamins & minerals.
- (4) Muscle Physiology
- (5) Craniofacial biology: cell adhesion molecules & mechanism of adhesion.
- (6) Bleeding disorders in Orthodontics: haemophilia.

Dental Materials

- (1) Gypsum products: dental plaster, dental stone & their properties, setting reaction etc.
- (2) Impression materials: impression materials in general & particularly of alginate.
- (3) Acrylics: chemistry, composition, physical properties.
- (4) Composites: Composition, types, properties, setting reaction.
- (5) Banding & bonding cements: Zinc phosphate, zinc silicophosphate, zinc polycarboxylate, resin cements and glass ionomer cements.

- (6) Wrought metal alloys: deformation, strain hardening, annealing, recovery, recrystallization, grain growth, properties of metal alloys.
- (7) Orthodontic arch wires: stainless steel, gold, wrought cobalt chromium, nickel alloys, alpha & beta titanium alloys.
- (8) Elastics: latex & non latex elastics
- (9) Applied physics: bioengineering, metallurgy
- (10) Specification & test methods used for materials in Orthodontics.
- (11) Survey of contemporary literature & Recent advances in above mentioned materials.

Genetics

- (1) Cell structure, DNA, RNA, protein synthesis, cell division.
- (2) Chromosomal abnormalities.
- (3) Principles of orofacial genetics.
- (4) Genetics in malocclusion.
- (5) Molecular basis of genetics.
- (6) Studies related to malocclusion.
- (7) Recent advances in genetics related to malocclusion.
- (8) Genetic counselling.
- (9) Bioethics & relationship to orthodontic management of patients.

Physical Anthropology

- (1) Evolutionary development of dentition.
- (2) Evolutionary development of jaws.

Pathology

- (1) Inflammation
- (2) Necrosis

Biostatistics

- (1) Statistical principles:
 - (a) Data collection
 - (b) Method of presentation
 - (c) Method of summarizing
 - (d) Methods of analysis: different tests, errors
- (2) Sampling & sampling techniques
- (3) Experimental models, design & interpretation
- (4) Development of skills for preparing clear, concise & cogent scientific abstracts & publication.

Applied Research Methodology in Orthodontics

- (1) Experimental design
- (2) Animal experiment protocol
- (3) Principles in the development, execution & interpretation of methodologies in orthodontics
- (4) Critical scientific appraisal of literature

Applied Pharmacology

Definitions & terminologies used – Dosage and mode of administration of drugs. Action and fate of drugs in the body, Drug addiction, tolerance and hypersensitive reactions, Drugs acting on the central nervous system, general anesthetics hypnotics, analeptics and tranquilizers. Local anesthetics, Chemotherapeutics and antibiotics. Vitamins: A, D, B – complex group, C & K etc.

Part-II Paper-I (9542) – Orthodontic History, Concepts of Occlusion and esthetics, Child and Adult psychology, Etiology and classification of malocclusion, Dentofacial anomalies, Diagnostic procedures and treatment planning in Orthodontics, Practice management in Orthodontic

Orthodontic History

- (1) Historical perspective
- (2) Evolution of orthodontic appliances
- (3) Pencil sketch history of orthodontic peers
- (4) History of Orthodontics in India.

Concepts of Occlusion and Esthetics

- (1) Structure & function of all anatomic components of occlusion.
- (2) Mechanics of articulation
- (3) Recording of masticatory function
- (4) Diagnosis of occlusal dysfunction
- (5) Relationship of TMJ anatomy and pathology and related neuro-muscular physiology.

Etiology and Classification of Malocclusion

- (1) A comprehensive review of local and systemic factors in causation of malocclusion.
- (2) Various classifications of malocclusion.

Dentofacial Anomalies

- (1) Anatomical, physiological and pathological characteristics of major groups of developmental defects of orofacial structures.

Child and Adult Psychology

- (1) Stages of child development
- (2) Theories of psychological development
- (3) Management of child in orthodontic treatment
- (4) Management of handicapped child
- (5) Child motivation and psychological problems related to malocclusion/ orthodontics
- (6) Adolescent psychology
- (7) Behavioral psychology and communication.

Diagnostic Procedures and Treatment Planning in Orthodontics

- (1) Emphasis on the process of data gathering, synthesis and translating it into a treatment plan
- (2) Problem cases – analysis of cases and its management
- (3) Adult cases, handicapped and mentally retarded cases and their special needs
- (4) Critique of treated cases

Cephalometrics

- (1) Instrumentation
- (2) Image processing
- (3) Tracing and analysis of errors and applications
- (4) Radiation hygiene
- (5) Advanced cephalometric techniques
- (6) Comprehensive review of literature
- (7) Video imaging principles and its applications

Practice Management in Orthodontics

- (1) Economics and dynamics of solo and group practice
- (2) Personal management
- (3) Materials management

- (4) Public relations
- (5) Professional relationship
- (6) Dental ethics and jurisprudence
- (7) Sterilization procedures
- (8) Community based orthodontics

Part-II Paper-II (9543) - Clinical Orthodontics

Myofunctional orthodontics

- (1) Basic principles
- (2) Contemporary appliances: their design and manipulation
- (3) Case selection and evaluation of treatment results
- (4) Review of current literature

Dentofacial orthopaedics

- (1) Principles
- (2) Biomechanics
- (3) Appliance design and manipulation
- (4) Review of contemporary literature

Cleft lip & palate rehabilitation

- (1) Diagnosis and treatment planning
- (2) Mechanotherapy
- (3) Growth problems in cleft cases
- (4) Speech physiology, pathology and elements of therapy as applied to orthodontics
- (5) Team rehabilitative procedures

Biology of tooth movement

- (1) Principles of tooth movement: a review
- (2) Review of contemporary literature
- (3) Applied histophysiology of bone, PDL
- (4) Molecular and ultracellular consideration in tooth movement

Orthodontic / Orthognathic Surgery

- (1) Role of orthodontist in conjoint diagnosis & treatment planning
- (2) Pre and post surgical orthodontics
- (3) Participation in actual clinical cases, progress evaluation & post retention study
- (4) Review of current literature

Ortho / perio / prostho/endo interrelationship

- (1) Principles of interdisciplinary patient treatment
- (2) Common problems and their management

Basic principles of Mechanotherapy includes removable appliances and fixed appliances

- (1) Design
- (2) Construction
- (3) Fabrication
- (4) Management
- (5) Review of current literature on treatment methods and results

Applied preventive aspects in Orthodontics

- (1) Caries and periodontal disease prevention
- (2) Oral hygiene measures
- (3) Clinical procedures

Interceptive Orthodontics

- (1) Principles
- (2) Growth guidance
- (3) Diagnosis and treatment planning
- (4) Therapy emphasis on :
 - (a) Dento facial problems
 - (b) Tooth material discrepancies
 - (c) Minor surgery for orthodontics

Retention and Relapse

- (1) Mechanotherapy – special reference to stability of results with various procedures.
- (2) Post retention analysis.
- (3) Review of contemporary literature.

Recent Advances Like

- (1) Use of implants
- (2) Lasers
- (3) Application of F.E.M.
- (4) Distraction Osteogenesis

Part-II Paper-III (9544) - Descriptive and analyzing type of question

3.2 Practical

Pre-Clinical Exercises: A general outline of the type of exercises is given here.

- (1) General wire bending exercises to develop the manual dexterity.
- (2) Clasps, Bows and Springs used in the removable appliances.
- (3) Soldering and welding exercises.
- (4) Fabrication of removable habit breaking, mechanical and functional appliances, also all types of space maintainers and space regainers.
- (5) Bonwill Hawley Ideal arch preparation.
- (6) Construction of Orthodontic models trimmed and polished preferably as per specifications of Tweed or A.B.O.
- (7) Cephalometric tracing and various analyses, also superimposition methods.
- (8) Fixed appliance typhodont exercises.
 - (a) Training shall be imparted in one basic technique i.e. Standard Edgewise / Begg technique or its derivative / Straight wire etc., with adequate exposure to other techniques.
 - (b) Typhodont exercise –
 - i. Band making
 - ii. Bracket positioning and placement
 - iii. Different stages in treatment appropriate to technique taught
- (9) Clinical photography
- (10) Computerized imaging
- (11) Preparation of surgical splints and splints for TMJ problems
- (12) Handling of equipments like vacuum forming appliances and hydro solder etc.

Basic Pre-Clinical Exercise Work for the MDS Students:

1. Clasps:

| Sl.No | Exercise | No. |
|-------|-------------------------------------|-----|
| 1. | ¾ Clasps | 1 |
| 2. | Triangular Clasps | 1 |
| 3. | Adam's clasp | 2 |
| 4. | Modification of Adam's – With Helix | 2 |
| 5. | Southend Clasp | 1 |

2. Labial Bows:

| Sl.No. | Exercise | No. |
|--------|----------------------------------|-----|
| 1. | Short labial bow (upper & lower) | 1 |
| 2. | Long labial bow (upper & lower) | 1 |
| 3. | Split high labial bow | 1 |

3. Springs:

| Sl.No. | Exercise | No. |
|--------|--------------------------|-----|
| 1 | Double cantilever spring | 1 |
| 2 | Coffin spring | 1 |
| 3 | T spring | 1 |

4. Appliances:

| Sl.No. | Exercise | No. |
|--------|---|-----|
| 1. | Hawley's retention appliance with anterior bite plane | 1 |
| 2. | Upper Hawley's appliance with posterior bite plane | 1 |
| 3. | Upper expansion appliance with expansion screw | 1 |
| 4. | Habit breaking appliance with tongue crib | 1 |
| 5. | Oral screen and double oral screen | 1 |
| 6. | Lip bumper | 1 |

| | | |
|-----|---|---|
| 7. | Splint for Bruxism | 1 |
| 8. | Catalans appliance | 1 |
| 9. | Activator | 1 |
| 10. | Bionator | 1 |
| 11. | Frankel-FR 1& 2 appliance | 2 |
| 12. | Twin block | 1 |
| 13. | Lingual arch | 1 |
| 14. | TPA | 1 |
| 15. | Quad helix | 1 |
| 16. | Utility arches | 1 |
| 17. | Pendulum appliance | 1 |
| 18. | Canine Retractor(Marcotte & PG Spring) | 1 |

5. Soldering exercises:

| Sl.No. | Exercise | No. |
|---------------|--------------------------|------------|
| 1 | Star/Comb/Christmas tree | 1 |

6. Study model preparation:

7. Model analysis – Mixed and permanent Dentition:

8. Cephalometrics:

| Sl.No. | Exercise |
|--------|---|
| 1 | Lateral cephalogram to be traced in different colors and super imposed to see the accuracy of tracing |
| 2 | Vertical and Anterio-Posterior Cephalometric analysis |
| 3 | Soft tissue analysis – Holdaway and Burstone |
| 4 | Various superimposition methods |

9. Basics of Clinical Photography including Digital Photography:

10. Typodont exercises: Begg or P.E.A. method/Basic Edgewise:

| Sl.No | Exercise |
|-------|---|
| 1 | Teeth setting in Class-II division I malocclusion with maxillary anterior Proclination and mandibular anterior crowding |
| 2 | Band pinching, welding brackets and buccal tubes to the bands |
| 3 | Different Stages dependent on the applied technique |

CLINICAL WORK:

Once the basic pre-clinical work is completed in three months, the students can take up clinical cases and the clinical training.

Each postgraduate student should start with a minimum of 50 fixed orthodontics cases and 20 removable including myofunctional cases of his/her own. Additionally he/she should handle a minimum of 25 transferred cases.

The type of cases can be as follows:

- Removable active appliances
- Class-I malocclusion with Crowding
- Class-I malocclusion with bi-maxillary protrusion
- Class-II division – 1
- Class-II division – 2
- Class-III (Orthopedic, Surgical, Orthodontic cases)
- Inter disciplinary cases
- Removable functional appliance cases like activator, Bionator, functional regulator, twin block and new developments
- Fixed functional appliances – Herbst appliance, jasper jumper etc
- Dento-facial orthopedic appliances like head gears, rapid maxillary expansion, NiTi expander etc.
- Appliance for arch development such as molar distalization
- Fixed mechanotherapy cases (Begg, PEA, Tip edge, Edgewise, Lingual)
- Retention procedure of above treated cases.

4. TEACHING PROGRAMME:

1st Year

- (1) Seminars: One seminar per week to be conducted in the department. A minimum of five seminars should be presented by each student each year.
- (2) Journal club: One Journal club per week to be conducted in the department. A minimum of five journal articles should be presented by each student each year.
- (3) Protocol for dissertation to be submitted on or before the end of six months from the date of admission.
- (4) Undergraduate classes: Around 4-5 classes should be handled by each post graduate student.
- (5) Field survey: To be conducted and submit the report.
- (6) Inter- departmental meetings: should be held once a month.
- (7) Case discussions
- (8) Field visits: To attend dental camps and to educate the masses.
- (9) Basic subject classes
- (10) Internal assessment or Term paper

2nd Year:

The clinical cases taken up should be followed under supervision. More case discussions and cases to be taken up. Other routine work as follows.

- (1) Seminars: One Seminar per week to be conducted in the department. Each student should present a minimum of five seminars each year.
- (2) Journal club: One Journal club per week to be conducted in the department. Each student should present a minimum of five journal articles each year.
- (3) Library assignment to be submitted on or before the end of six months.
- (4) Undergraduate classes: each post graduate student should handle around 4-5 classes.
- (5) Inter- departmental meetings: should be held once a month.
- (6) Case discussions
- (7) Field visits: To attend dental camps and to educate the masses.
- (8) Internal assessment or Term paper
- (9) Dissertation work: On getting the approval from the university, work for the dissertation to be started.

3rd Year:

The clinical cases taken up should be followed under supervision. More case discussions and cases to be taken up. Other routine work as follows:

- (1) Seminars: One Seminar per week to be conducted in the department. Each student should present a minimum of five seminars each year.
- (2) Journal club: One Journal club per week to be conducted in the department. . A minimum of five journal articles should be presented by each student each year.
- (3) Undergraduate classes: each post graduate student should handle around 4-5 classes.
- (4) Inter- departmental meetings: should be held once a month.
- (5) The completed dissertations should be submitted six months before the final examination.
- (6) Case discussions
- (7) Field visits: To attend dental camps and to educate the masses.
- (8) Finishing and presenting the cases taken up.
- (9) Preparation of finished cases and presenting the cases (to be presented for the examination)
- (10) Mock Examination

Dissertation

- (1) The synopsis for dissertation should be submitted on or before the end of six months from the date of admission as per calendar of events to the Registrar, Mahatma Gandhi University of Medical Sciences and Technology, Rajasthan, through proper channel.
- (2) The completed dissertation should be submitted 6 months before the final examination as per the calendar of events to the Registrar, Mahatma Gandhi University of Medical Sciences and Technology, Rajasthan, through proper channel.
- (3) The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects.
- (4) Approval of dissertation is essential before a candidate appears for the university examination.

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 is 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.

5. SCHEME OF EXAMINATION

5.1 Theory : 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 (9541) : Applied Basic Sciences

(Applied Basic Sciences, Applied Anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology, Applied Research methodology, Biostatistics and applied pharmacology)

Part - II

Paper-I (9542) Orthodontic History, Concepts of Occlusion and esthetics, Child and Adult psychology, Etiology and classification of malocclusion, Dentofacial anomalies, Diagnostic procedures and treatment planning in Orthodontics, Practice management in Orthodontic

Paper-II (9543) Clinical Orthodontics

Paper-III (9544) Descriptive and analyzing type question

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.

5.2 Practical / Clinical Examination (200 marks)

| | | |
|--|---|----------|
| Exercise No. 1: Functional Case Selection of case for functional appliance and recording of construction bite Fabrication and delivery of the appliance the next day | : | 50 marks |
| Exercise No. 2: Multiband exercise Bonding of SWA brackets or construction of suitable arch wire | : | 50 marks |
| Exercise No. 3: Display of records of the treated cases (Minimum 5 cases) 5 cases x 15 marks | : | 75 marks |
| Exercise no. 4: Long Case discussion | : | 25 Marks |

Allotted time

| No | Exercise | Marks allotted | Approximate Time |
|----|--|----------------|------------------|
| 1. | Functional Appliance | 50 | 1 hour |
| 2 | Bonding or arch wire fabrication | 50 | 1 hour 30 min |
| 3 | Display of case records (a minimum of 5 cases to presented with all the records) | 75 | 1 hour |
| 4 | Long cases | 25 | 2 hours |

5.3 Viva Voce and Pedagogy : 100 marks

(a) Viva – Voce examination: 80 marks

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

(b) Pedagogy Exercise: 20 marks

A topic is given to each candidate at 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
9541

Bas.Sci.-I

Master of Dental Surgery Part-I Examination Month Year
ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS

Applied Basic Sciences

(Applied Basic Sciences, Applied Anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology, Applied Research methodology, Biostatistics and applied pharmacology)

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 | Genetics & malocclusion. | 10 |
| Q.2 | Anatomy of mandible with its nerve supply and blood supply. | 10 |
| Q.3 | Longitudinal Growth Study | 10 |
| Q.4 | Niti alloys and its applications in Orthodontics | 10 |
| Q.5 | Calcium Metabolism | 10 |
| Q.6 | Divine Proportions | 10 |
| Q.7 | Functional Matrix Theory | 10 |
| Q.8 | Growth Rotation | 10 |
| Q.9 | TMD | 10 |
| Q.10 | Maturation of Oral Function | 10 |

MODEL PAPER

M.D.S. Part-II
9542

Diag.Treat.Plan.-I

Master of Dental Surgery Part-II Examination Month Year
ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS

Paper I

Orthodontic History, Concepts of Occlusion and esthetics, Child and Adult psychology, Etiology and classification of malocclusion, Dentofacial anomalies, Diagnostic procedures and treatment planning in Orthodontics, Practice management in Orthodontic

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 Describe the Cephalometric parameters you will evaluate to diagnose skeletal dysplasias. (25)
- Q.2 Discuss form and function correlation in Open Bite and Tongue Thrust habit cases. (25)
- Q.3 Write short notes on: (5 x 10 = 50)
- (a) Self drilling and self tapping mini screws.
 - (b) Need of evidence based treatment planning
 - (c) Virtual study models
 - (d) Pathophysiology of sleep apnoea as it concerns an orthodontist
 - (e) Use of physical restraints in behaviour management

MODEL PAPER

M.D.S. Part-II
9543

Clin.Ortho.Mech.-II

Master of Dental Surgery Part-II Examination Month Year
ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS

Paper II
Clinical Orthodontics

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 the various methods of leveling the arches. 25
- Q.2 Discuss the role of Functional appliances in modern Orthodontics 25
- Q.3 Write short notes on: 5 x 10 = 50
- a) Adult Orthodontics
 - b) Indications of lower incisor extraction
 - c) Distraction Osteogenesis vs Lefort I Osteotomy
 - d) Self Ligation
 - e) 0.018 slot versus 0.022 slot

MODEL PAPER

**M.D.S. Part-II
9544**

Essay.-III

Master of Dental Surgery Part-II Examination Month Year
ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS

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 | Three Dimensional Imaging Techniques for Orthodontics | 50 |
| Q.2 | Discuss contemporary Orthodontic materials for fixed Orthodontics in detail. | 50 |
| Q.3 | Cleft Lip and palate rehabilitation | 50 |