

**MASTER OF DENTAL SURGERY (M.D.S) DEGREE COURSE
-THREE YEAR SCHEME
(As per M.D.S Course Regulations of Dental Council of India, 2017)**

ORTHODONTICS & DENTOFACIAL ORTHOPAEDICS



YENEPOYA UNIVERSITY
(Recognized Under Sec 3(A) of the UGC Act, 1956 as per
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MANGALORE, KARNATAKA.

CONTENTS

SECTION I	Regulations	3-8
SECTION II	Goals & Objectives of MDS course in Orthodontics and Dentofacial Orthopaedics	9-11
SECTION III	Course Content	12-29
SECTION IV	Teaching/learning activities and Monitoring learning progress Details of Examination	30-32
SECTION V	Ethics in Dentistry	33-34

SECTION I

REGULATIONS

1. Title of the Course: M.D.S. in Orthodontics and Dentofacial Orthopaedics.

2. Eligibility Certificate from Yenepoya University

No candidate shall be admitted to any postgraduate MDS course unless the candidate has obtained and produced eligibility certificate issued by University. The candidate has to make an application to the University with the following documents along with the prescribed fee:

1. BDS pass / degree certificate issued by the University.
2. Marks cards of all the university examinations passed (I to IV BDS year course).
3. Attempt Certificate issued by the Principal.
4. Certificate regarding the recognition of the Dental college by the Dental Council of India.
5. Completion of paid rotatory internship certificate from a recognized college.
6. Registration by any State Dental Council and

A candidate who has been admitted to postgraduate course should register his / her name in the University within a month of admission after paying the registration fee.

3. Duration of the Course

The Course shall be of three years duration.

All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as full time candidates.

4. Method of training

The training of postgraduate for degree shall be full time with graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, grand rounds, case demonstration, clinics, journal review meetings and clinical meetings. Every candidate should participate in the teaching and training programme of undergraduate students. Training should include involvement in laboratory and experimental work, and research studies

5. Attendance, Progress and Conduct

A candidate pursuing degree/diploma course should work in the concerned department of the institution for the full period as a full time student. No candidate is permitted to own a clinic/work in clinic/laboratory/nursing home while studying postgraduate course, 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, case presentation, clinics and lectures during each year prescribed by the department and not absent himself / herself from work without 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.

6. Monitoring Progress of Studies

Work diary / Log Book: Every candidate shall maintain a work diary and record of his/ her participation in the training programme conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate. The work diary shall be scrutinized and certified by the Head of the Department and Head of the Institution, and presented in the university practical/clinical examination.

Periodic tests:

In case of degree courses of three years duration, the concerned departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practical / clinical and viva voce. Records and marks obtained in such tests will be maintained by the Head of the Department and sent to the University, when called for.

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.

7. Dissertation

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

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

Every candidate shall submit to the Registrar of the University in the prescribed proforma, a synopsis containing particulars of proposed dissertation work within six months from the date of commencement of the course 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 approval of the University.

The dissertation should be written under the following headings:

- i. Introduction
- ii. Aims or Objectives of study
- iii. Review of literature
- iv. Results
- v. Discussions
- vi. Conclusion
- vii. Summary
- viii. Reference
- ix. Tables
- x. 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 typed in double line spacing on one side of paper (A4 size, 8.27" x 11.69") and properly. Spiral binding should be avoided. The dissertation shall be certified by the guide, head of the department and head of the Institution.

Four copies of dissertation thus prepared shall be submitted to the Registrar (Evaluation), six months before final examination on or before the dates notified by the University

The dissertation shall be valued by examiners appointed by the University. Approval 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/ Yenepoya University.

Co-guide: A co-guide may be included provided the work requires substantial cont from a sister department or from another institution recognised for teaching/training by Yenepoya University/Dental Council of India. The co-guide shall be a recognized postgraduate teacher of Yenepoya University.

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

8. Scheme of Examination

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

- i) **Attendance:** Every candidate shall have fulfilled the attendance prescribed by the University during each academic year of the postgraduate course.
- ii) **Progress and conduct:** Every candidate shall have participated in seminars, review meetings, symposia, conferences, case presentations, clinics during each year as designed by the concerned department
- iii) **Work diary and Logbook:** Every candidate shall maintain a work diary and logbook for recording his/her participation in the training programmes conducted by the department. The work diary and logbook shall be verified and certified by the Head of the Department and Head of the institution.

The certification of satisfactory progress by the head of the department and head of the institution shall be based on (i), (ii) and (iii) mentioned above.

Schedule of Examination: Written examination shall consist of Basic Sciences (Part-I) of three hours duration shall be conducted at the end of First year of MDS course. Part-II Examination shall be conducted at the end of Third year of MDS course. Part-II Examination shall consist of Paper-I, Paper-II and Paper-III, each of three hours duration. The university shall conduct one examination in a year at the end of academic year.

9. University Examination

M.D.S. Degree examinations in any branch of study shall consist of dissertation, written paper (Theory), Practical/Clinical and Viva voce.

(a) Dissertation: Acceptance of dissertation shall be a precondition for the candidate to appear for the final examination.

(b)Written Examination (Theory): Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 75. Paper I, II and III shall consist of two long questions carrying 20 marks each and 5 short essay questions carrying 7 marks each. The fourth paper will be to write an essay. Questions on recent advances may be asked in any or all the papers. Distribution of topics in each paper is shown in Section III along with course description.

(c)Practical / Clinical Examination:

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

The actual format of clinical examination are given in Section III. The total marks for practical / clinical examination shall be 200.

(d)Viva Voce: Viva-Voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The total marks shall be 100 and the distribution of marks shall be as under:

- (i) For examination of all components of syllabus 80 Marks
- (ii) For (Pedagogy) demonstration of teaching skills 20 Marks

Examiners

There shall be at least four examiners in each branch of study. Out of four, two shall be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by Yenepoya University and Dental Council of India from time to time.

10. Criteria for Declaring as Pass

To pass in the University examination, a candidate shall secure in both theory examination and the practical/clinical including viva voce independently an aggregate of 50% of total marks allotted (150 marks out of 300 allotted for theory and 150 out of 200 for clinical + 100 for viva voce together). A candidate securing less mark as described above shall be declared to have failed in the examination.

A candidate who is declared successful in the MDS Examination shall be granted a Degree Master of Dental Surgery in the respective specialty.

SECTION II

GOALS & OBJECTIVES OF MDS COURSE

Goals:

The goals of postgraduate training is to train B.D.S. graduate who will, after successful completion of the course:

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

OBJECTIVES :

The training programme in Orthodontics is to structure and achieve the following four objectives.

KNOWLEDGE:

1. The dynamic interaction of biologic processes and mechanical forces acting on the stomatognathic system during orthodontic treatment.
2. The etiology, pathophysiology, diagnosis and treatment planning of various common Orthodontic problems.
3. Various treatment modalities in Orthodontics, preventive, interceptive and corrective.
4. Basic sciences relevant to the practice of Orthodontics.
5. Interaction of social, cultural, economic, genetic and environmental factors and their relevance to management of oro-facial deformities.
6. Factors affecting the long-range stability of orthodontic correction and their management.
7. Personal hygiene and infection control, prevention of cross infection and safe disposal of hospital waste, keeping in view the high prevalence of Hepatitis and HIV and other highly contagious diseases.

SKILLS:

1. To 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.

2. To be competent to fabricate and manage the most appropriate appliance – intra or extra oral, removable or fixed, mechanical or functional, and active or passive – for the treatment of any orthodontic problem to be treated singly or as a part of multidisciplinary treatment of orofacial deformities.

ATTITUDES :

1. Develop an attitude to adopt ethical principles in all aspects of orthodontic practice.
2. Professional honesty and integrity are to be fostered.
3. Treatment care is to be delivered irrespective of the social Status, cast creed or colleagues.
4. Willingness to share the knowledge and clinical experience with professional colleagues.
5. Willingness to adopt, after a critical assessment, new methods and techniques of orthodontic management developed from time to time based on scientific research, which are in the best interest of the patient.
6. Respect patients rights and privileges, including patients right to information and right to seek a second opinion.
7. Develop attitude to seek opinion from allied medical and dental specialists as and when required.

COMMUNICATION SKILLS:

1. Develop adequate communication skills particularly with the patients giving them the various options available to manage a particular Dentofacial problem and to obtain a true informed consent from them for the most appropriate treatment available at that point of time.
2. Develop the ability to communicate with professional colleagues, in Orthodontics or other specialties through various media like correspondence, Internet, e-video, conference, etc. To render the best possible treatment.

HUMAN VALUES, ETHICAL PRACTICE AND COMMUNICATION ABILITIES:

1. Adopt ethical principles in all aspects of practice. Professional honesty and integrity are to be fostered.
2. Patient care is to be delivered irrespective of social status, caste, creed or religion of the patient.
3. Develop communication skills, in particular and skill to explain various optior available in management and to obtain a true informed consent from the patient
4. Provide leadership and get the best out of his team in a congenial working atmosphere.

5. Apply high moral and ethical standards while carrying out human or animal research.
6. Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
7. Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

SECTION III

COURSE CONTENT:

The program outlined, addresses both the knowledge needed in Orthodontics and allied Medical specialties in its scope. A minimum of three years of formal training through a graded system of education as specified, will equip the trainee with skill and knowledge at its completion to be able to practice basic Orthodontics and have the ability to intelligently pursue further apprenticeship towards advanced Orthodontics.

SPREAD OF THE CURRICULUM:

Six months teaching of basic subjects including completion of pre-clinical exercises, 2 ½ years of coverage of all the relevant topics in Orthodontics, clinical training involving treatment of patients and submission of dissertation.

Basic Science (Paper I) topics include:

1. Applied Anatomy
2. Physiology
3. Dental Materials
4. Genetics
5. Physical Anthropology
6. Pathology
7. Biostatics
8. Applied research methodology in Orthodontics
9. Applied Pharmacology

Paper II includes:

10. Orthodontic History
11. Concepts of Occlusion and esthetics
12. Malocclusion and Dentofacial deformity in contemporary society
13. Dentofacial anomalies
14. Child and adult psychology
15. Diagnostic procedures and treatment planning in orthodontics
16. Cephalometrics
17. Three Dimensional imaging in Orthodontics
18. Practice management in Orthodontics

Clinical Orthodontics (Paper III) includes:

19. Myofunctional Orthodontics
20. Dentofacial Orthopedics
21. Cleft lip & Palate rehabilitation
22. Biology of tooth movement
23. Orthodontic/Orthognathic Surgery
24. Ortho / Perio / Prosthodontics/ Endo Inter Relationship (Inter Disciplinary)
25. Basic Principles Of Mechanotherapy
26. Applied Preventive Aspects In Orthodontics
27. Interceptive Orthodontics
28. Adult Orthodontics
29. Retention & Relapse
30. Miscellaneous
31. Recent Advances

1. APPLIED ANATOMY:

a. Prenatal craniofacial growth: (Embryology)

Stages of embryonic development, Origin of head, origin of face, origin of teeth, origin of palate, origin of TMJ.

b. Postnatal craniofacial growth:

Bones of skull, the oral cavity, development of chin, the hyoid bone, general growth of head, face growth.

c. Bone growth:

Origin of bone, composition of bone, units of bone structure, schedule of ossification, mechanical properties of bone, bone disorders, roentgen graphic appearance of bone, Mechanism of bone growth and remodelling.

d. Assessment of growth and development:

Growth prediction, Growth spurts, Growth rotations, the concept of normality and growth increments of growth, differential growth, gradient of growth, methods of gathering growth data, Theories of growth and recent advances, Factors affecting physical growth.

e. TMJ and Muscles of mastication:

Anatomy and physiology, Development of muscles, muscle change during growth, muscle function and facial development, muscle function and malocclusion, Temporomandibular dysfunction and orthodontics- aetiology, diagnosis and management.

- f. **Development of dentition and occlusion:**
Dental development periods, order of tooth eruption, chronology of permanent tooth formation, Abnormal development of deciduous and permanent dentition, periods of occlusal development, pattern of occlusion.
 - g. **Assessment of skeletal age:**
The carpal bones, Cervical vertebrae method and other methods
2. **PHYSIOLOGY:**
- a. **Endocrinology and its disorders**
Growth hormone, thyroid hormone, parathyroid hormone, ACTH, pituitary gland hormones and the other hormones affecting growth.
 - b. **Calcium and its metabolism**
 - c. **Nutrition – metabolism and their disorders:** Proteins, carbohydrates, fats, vitamins and minerals.
 - d. **Muscle Physiology**
 - e. **Craniofacial Biology**
 - f. **Orthodontic treatment in medical disorders:** Hemophilia, Infective endocarditis, diabetes, Leukemia, Renal failure etc
 - g. **Maturation of orofacial functions:** Respiration, Deglutition, Mastication
3. **DENTAL MATERIALS:**
- a. **Orthodontic materials**
 - b. **Gypsum products:** Dental Plaster, Dental Stone and their properties and setting reaction etc.
 - c. **Impression materials:** Impression materials in general and particularly of alginate impression materials.
 - d. **Acrylics:** Chemistry, composition and physical properties.
 - e. **Composites:** Composition, types, properties, setting reaction.
 - f. **Banding and bonding cements:** Zn (PO₄)₂, zinc silicophosphate, Zinc polycarboxylate, resin cements and glass Ionomer cements.
 - g. **Wrought metal alloys:** deformation, strain hardening, annealing, recovery, recrystallisation, grain growth, properties of metal alloys.
 - h. **Orthodontic arch wires:** stainless steel, gold, wrought cobalt chromium nickel alloys, alpha & beta titanium alloys and others.
 - i. **Elastics:** Latex and non-latex elastics.
 - j. **Applied physics:** Bioengineering and metallurgy.
 - k. **Specification and tests methods** used for materials used in Orthodontics
 - l. **Survey of all contemporary literature and Recent advances** in above – mentioned materials.

4. GENETICS:

- * Cell Structure, DNA, RNA, Protein synthesis, cell division
- * Chromosomal abnormalities.
- * Principles of orofacial genetics, Homeobox genes
- * Genetics in malocclusion
- * 5 molecular basis of genetics
- * Studies related to malocclusion
- * Recent advances in genetics related to malocclusion
- * Genetic counseling
- * Bioethics and relationship to orthodontic management of patients.

5. PHYSICAL ANTHROPOLOGY:

- a. Evolutionary development of dentition
- b. Evolutionary of development of jaws.

6. PATHOLOGY:

- a. Inflammation
- b. Necrosis

7. BIOSTATISTICS:

- a. Statistical principles
 - * Data Collection
 - * Method of presentation
 - * Method of Summarizing
 - * Methods of analysis – different tests / errors
- b. Sampling and Sampling technique
- c. Experimental models, design and interpretation.
- d. Development of skills for preparing clear concise and cogent scientific abstracts for publication.

8. APPLIED RESEARCH METHODOLOGY IN ORTHODONTICS:

- * Experimental design
- * Animal experimental protocol
- * Principles in the development, execution and interpretation of methodologies in Orthodontics
- * Critical Scientific appraisal of literature.

9. APPLIED PHARMACOLOGY:

- * Drugs affecting orthodontic tooth movement
- * Antibiotics in dentistry
- * Antisialogogues, Anticoagulants
- * Analgesics

10. ORTHODONTIC HISTORY:

- a. Historical perspective
- b. Evolution of orthodontic appliances
- c. Pencil sketch history of Orthodontic pliers
- d. History of Orthodontics in India

11. CONCEPTS OF OCCLUSION AND ESTHETICS:

- a. Structure and function of all anatomic components of occlusion
- b. Mechanics of articulation
- c. Recording of masticatory function
- d. Diagnosis of Occlusal dysfunction
- e. Relationship of TMJ anatomy and pathology and related neuromuscular physiology.

12. MALOCCLUSION AND DENTOFACIAL DEFORMITY IN CONTEMPORARY SOCIETY:

- a. A comprehensive review of the local and systemic factors in the aetiology of malocclusion.
- b. Various classifications of malocclusion.
- c. Epidemiology of malocclusion and orthodontic treatment needs.
- d. Orthodontic Indices

13. DENTOFACIAL ANOMALIES:

- a. Anatomical, physiological and pathological characteristics of major groups of developmental defects of the orofacial structures.

14. CHILD AND ADULT PSYCHOLOGY:

- a. Stages of child development.
- b. Theories of psychological development.
- c. Management of child in orthodontic treatment.
- d. Management of handicapped child.
- e. Motivation and Psychological problems related to malocclusion / orthodontics
- f. Adolescent psychology
- g. Behavioral psychology and communication.

15. DIAGNOSTIC PROCEDURES AND TREATMENT PLANNING IN ORTHODONTICS

- a. Emphasis on the process of data gathering, synthesis and translating it into a treatment plan : Clinical examination, Photographs, Radiographs, Study models etc
- b. Problem cases – analysis of cases and its management.
- c. Adult cases, handicapped and mentally retarded cases and their special problems
- d. Critique of treated cases.
- e. Craniofacial Imaging in orthodontics- TMJ Imaging, Airway, Facial Assymetries

16. CEPHALOMETRICS

- a. Instrumentation
- b. Image processing
- c. Tracing and analysis of errors and applications
- d. Radiation safety
- e. Advanced Cephalometric techniques- Digital Cephalometrics
- f. Video imaging principles and application.
- g. Cephalometric Templates`
- h. Cephalometric Superimpositions
- i. Comprehensive review of literature

17. THREE DIMENSIONAL IMAGING IN ORTHODONTICS

- a. Evolution, History and limitation of 2D imaging
- b. CT and CBCT
- c. Ultra sonography, MRI, Laser scanning, Stereophotogrammetry etc
- d. Three dimensional facial imaging
- e. 3D Digital Models

18. PRACTICE MANAGEMENT IN ORTHODONTICS:

- * Economics and dynamics of solo and group practices.
- * Personal management
- * Materials management
- * Public relations
- * Consent
- * Negligence
- * Professional relationship
- * Dental ethics and jurisprudence
- * Patient Communication Skills
- * Office sterilization procedures.
- * Record Maintenance
- * Community based Orthodontics.

CLINICAL ORTHODONTICS:

19. MYOFUNCTIONAL ORTHODONTICS:

- * Basic principles- Class II and Class III
- * Removable and Fixed appliances
- * Design, Construction and clinical management
- * Case selection and evaluation of the treatment results.
- * Contemporary appliances
- * Review of the current literature.

20. DENTOFACIAL ORTHOPAEDICS:

- * Principles
- * Biomechanics
- * Appliance design and manipulation-Head gear, Face Mask, Chin Cup
- * Review of contemporary literature

21. CLEFT LIP AND PALATE REHABILITATION:

- * Classification, diagnosis and treatment planning
- * Management- cleft orthodontics
- * Special growth problems of cleft cases
- * Speech physiology, pathology and elements of therapy as applied to orthodontics
- * Team rehabilitative procedures.

22. BIOLOGY OF TOOTH MOVEMENT:

- a. Principles of tooth movement - review
- b. Theories of tooth movement
- c. Applied histophysiology of bone, periodontal ligament
- d. Molecular and ultra cellular consideration in tooth movement
- e. Review of contemporary literature
- f. Mechanical principles in orthodontic force control-Biomechanics

23. ORTHODONTIC / ORTHOGNATHIC SURGERY:

- * Orthodontist's role in conjoint diagnosis and treatment planning
- * Surgical procedures
- * Pre and post surgical orthodontics
- * Participation in actual clinical cases, progress evaluation and post retention study
- * Review of current literature.

**24. ORTHO / PERIO / PROSTHO/ ENDO INTER RELATIONSHIP
(INTER DISCIPLINARY)**

- * Principles of interdisciplinary patient treatment
- * Common problems and their management

25. BASIC PRINCIPLES OF MECHANOTHERAPY:

Includes Removable appliances and fixed appliances

- a. Designs
- b. Construction
- c. Mode of action
- d. Various prescriptions
- e. Bonding
- f. Anchorage
- g. Clinical Management of all types of malocclusion
- h. Review of current literature on treatment methods and results

26. APPLIED PREVENTIVE ASPECTS IN ORTHODONTICS

- a. Caries and periodontal disease prevention
- b. Oral hygiene measures
- c. Clinical procedures

27. INTERCEPTIVE ORTHODONTICS

- * Principles
- * Growth guidance
- * Diagnosis and treatment planning
- * Therapy emphasis on:
 - a. Dento –facial problems
 - b. Tooth material discrepancies

28. ADULT ORTHODONTICS

- * Adult Interdisciplinary Therapy
- * Diagnosis- periodontal, TMJ, Skeletal
- * Biomechanical Consideration
- * Management

29. RETENTION AND RELAPSE

- a. Mechanotherapy – special reference to stability of results with various procedures
- b. Various retention devices
- c. Post retention analysis
- d. Iatrogenic effects of orthodontic treatment-White spot lesion, Root Resorption
- e. Review of contemporary literature

30. MISCELLANEOUS

- a. Minor surgical procedures- Impaction, Frenectomy, Corticotomy, Pericision etc
- b. Orthodontist role in upper airway sleep disorders.

31. RECENT ADVANCES LIKE:

- * TAD s
- * Lasers
- * Application of F.E.M.
- *

Distraction Osteogenesis

- * Self Ligation
- * Clear Aligner Treatment
- * Lingual Orthodontics
- * Robotic technologies

32. Clinical Anthropology

33. Speech Physiology

SKILLS:

II. Pre-Clinical Exercises

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. All types of space maintainers and space regainers.
5. Construction of Orthodontic models trimmed and polished preferably as per specifications of Tweed or A.B.O.
6. Cephalometric tracing, Analysis, and superimposition methods-Manual as well as digital.
7. Fixed appliance typhodont exercises.
 - a) Training shall be imparted in one basic technique i.e. Standard Edgewise / Begg technique or its derivative / Pre adjusted edgewise 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.

First Year: [3 months programme to enter clinics

II.. Basic – Pre-Clinical Exercise work.

1. NON-APPLIANCE EXERCISES

All the following exercises should be done with 0.7 or 0.8mm wire

Sl.No.	Exercise	No.
	Straightening of 6” & 8” long wire	1 each

2	Square	1
3	Rectangle	1
4	Triangle of 2" side	1
5	Circle of 2" Dia	1
6	Bending of 5U's	1
7	Bending of 5V's	1
8	Bending of U.V.	

2. CLASPS

Sl.No.	Exercise	No.
1	$\frac{3}{4}$ Clasps	2
2	Full clasps	2
3	Triangular Clasps	2
4	Adam's Clasp – upper molar	2
5	Adam's Clasp – lower molar	2
6	Adam's Clasp – Pre- molar	2
7	Adam's Clasp – Incisor	2
8	Modification of Adam's – With Helix	2
9	Modifications Adam's – With distal extension	2
10	Modification of Adam's – With soldered tube	2
11	Duyzing Clasps on Molars	2
12	Southend Clasp	1

3. LABIAL BOWS

Sl.No.	Exercise	No.
1	Short labial bow (upper & lower)	1
2	Long labial bow (upper & lower)	1
3	Robert's retractor	1
4	High labial bow-with apron spring's	1
5	Mill's labial bow	1
6	Reverse loop labial bow	1
7	Retention labial bow soldered to adam's clasp	1
8	Retention labial bow extending distal to second molar	1
9	Fitted labial bow	1
10	Split high labial bow	1

4. SPRINGS

Sl.No.	Exercise	No.
1	Finger spring-mesial movement	2
2	Finger spring-distal movement	2
3	Double cantilever spring	2
4	Flapper spring	2
5	Coffin spring	2
6	T spring	2

5. CANINE RETRACTORS

Sl.No.	Exercise	No.
1	U loop canine retractor	2 PAIRS
2	Helical canine retractor	2 PAIRS
3	Palatal canine retractor	2 PAIRS
4	Self-supporting canine retractor	2 PAIRS
5	Self-supporting canine retractor	2 PAIRS
6		2 PAIRS

6. APPLIANCES

Sl.No.	Exercise
1	Hawley's retention appliance with anterior bite plane
2	Upper Hawley's appliance with posterior bite plane
3	Upper expansion appliance with coffin spring
4	Upper expansion appliance with coffin spring
5	Upper expansion appliance with expansion screw
6	Habit breaking appliance with tongue crib
7	Oral screen and double oral screen
8	Lip bumper
9	Splint for Bruxism
10	Catlans appliance
11	Activator
12	Bionator
13	Frankel – FR 2 appliance
14	Twin block
15	Lingual arch
16	TPA
17	Quad helix
18	Bihelix
19	Utility arches
20	Pendulum appliance

7. SOLDERING EXERCISES

Sl.No.	Exercise	No.
1	Star	1
2	Comb	1
3	Christmas tree	1
4	Soldering buccal tube on molar bands	1

8. WELDING EXERCISES

Sl.No.	Exercise
1	Pinching and welding of molar, premolar, canine and Incisor bands
2	Welding of buccal tubes and brackets on molar bands and incisor bands

9. Impression of upper and lower arches in alginate

10. Study model preparation

11. MODEL ANALYSIS

Sl.No.	Exercise
1	Impression of upper and lower dental arches
2	PREPARATION OF STUDY MODEL – And all the permanent dentition analysis to be done.
3	PREPARATION OF STUDY MODEL – 2 And all the permanent dentition analysis to be done.
4	PREPARATION OF STUDY MODEL – 3 And all the mixed dentition analysis to be done.

12. CEPHALOMETRICS

Sl.No.	Exercise
1	Lateral cephalogram to be traced in five different colors and super imposed to be the accuracy of tracing
2	Steiner's analysis
3	Down's analysis
4	Tweed analysis
5	Rickett's analysis
6	Burstone analysis
7	Rakosi's analysis
8	Mc Namara analysis
9	Bjork analysis
10	Coben's analysis
11	Harvold's analysis
12	Soft tissue analysis – Holdaway and Burstone
13	COG's Analysis

13. BASICS OF CLINICAL PHOTOGRAPHY INCLUDING DIGITAL PHOTOGRAPHY

14. LIGHT WIRE BENDING EXERCISES FOR THE BEGG TECHNIQUE

Sl.No.	Exercise
1	Wire bending technique on 0.016' wire circle "Z" Omega
2	Bonwill-Hawley diagram
3	Making a standard arch wire
4	Inter maxillary hooks – Boot leg and Inter Maxillary type
5	Upper and Lower arch wire
6	Bending a double back arch wire
7	Bayonet bends (vertical and horizontal offsets)
8	Stage – III arch wire

9	Torquing auxiliary (upper)
10	Reverse Torquing (lower)
11	Up righting spring

15. TYPHODONT EXERCISES (Begg or P.E.A. method)

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	Stage – I
4	Stage – II
5	Pre Stage – III
6	Stage – III

CLINICAL WORK :

Once the students completes the 5 mock presentations, a clinical skill test (OSCE) will be conducted in order to asking whether he / she is eligible to enter the clinics. The clinical training is also associated with the craniofacial unit with special interest in cleft cases.

Each postgraduate student should start with a minimum of 40 cases of his/her own including cleft cases. Additionally he / she should handle a minimum of 20 transferred cases.

The type of cases can be as follows:

- i. Removable active appliances – 5 cases
- ii. Class – I malocclusion with Crowding
- iii. Class – I malocclusion with bi-maxillary protrusion
- iv. Class – II division - 1
- v. Class – II division - 2
- vi. Class – III (Orthopedic, Surgical, Orthodontic cases)
- vii. Inter disciplinary cases
- viii. Removable functional appliance cases like activator, Bionator, functional regulator, twin block and new developments.
- ix. Fixed functional appliances – Herbst appliance, Jasper jumper, Forsus etc. – 5 cases.
- x. Dento-facial orthopedic appliances like head gears, rapid maxillary expansion, niti expander etc., - 5 cases.
- xi. Appliance for arch development such as molar distalization – 5 cases.
- xii. Fixed mechano therapy cases (M.B.T, Begg, P.E.A, Tip edge, Edgewise) Retention procedures of above treated cases.
- xiii. Mutilated cases (use of implants).

Other work to be done during FIRST 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 articles should be presented by each student each year.
3. **Technique Discussions.**
4. **Protocol for dissertation to be submitted on or before the end of six months from the date of admission.**
5. **Under graduate classes** : Around 4 – 5 classes should be handled by each post-graduate student.
6. **Field Survey** : To be conducted and to be submitted the report
7. **Inter-departmental meetings** : should be held once in a month.
8. **Case discussions.**
9. **Field visits** : To attend dental camps and to educate the masses.
10. **Basic Science classes.**
11. **Internal assessment or Term paper**
12. **Cephalometric file** to be submitted at the end of one year.

Second Year :

The clinical cases taken up should be followed under the guidance of Staff. 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 seminars each year.
3. **Technique Discussions**
4. **Library assignment to be submitted at the end of the 2nd year.**
- 5.. **Under graduate classes** : Each post-graduate student should handle around 4-5 classes.
6. **Inter-departmental meetings**: should be held once in a month.
7. **Case discussions.**
8. **Field visits**: To attend dental camps and to educate the masses.
9. **Internal assessment or Term paper**
10. **Dissertation work**: On getting the approval from the university work for the dissertation to be started.

Third Year :

The clinical cases taken up should be followed under the guidance of Staff. 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 seminars each year.
3. **Under graduate classes:** Each post-graduate student should handle around 4-5 classes.
4. **Inter-departmental meetings:** should be held once in a month.
5. **The completed dissertation 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:

- a. The protocol 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, Yenepoya University, Karnataka, through proper channel.
- b. The completed dissertation should be submitted 6 months before the final examination as per calendar of events to the Registrar (Evaluation), Yenepoya University, Karnataka, through proper channel.
- c. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects.
- d. Approval of dissertation is essential before a candidate appears for the University examination.

SCHEME OF EXAMINATION:

A. 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)

Written examination shall consist of Basic Sciences (Part-I) of three hours duration shall be conducted at the end of First year of MDS course. Part-II Examination shall be conducted at the end of Third year of MDS course. Part-II Examination 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 Paper-III 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. Distribution of topics for each paper will be as follows:

Part – 1: Applied Basic Sciences : Applied anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology, Applied Research methodology, Bio-Statistics and Applied Pharmacology. (From 1 to 9 of the curriculum).

Part - 2

Paper-II : Orthodontic history, Concepts of occlusion and esthetics, Child and Adult Psychology, Malocclusion and dentofacial deformity in contemporary society, Three dimensional imaging in orthodontics, Dentofacial Anomalies, Diagnostic procedures and treatment planning in Orthodontics, Cephalometrics, Practice management in Orthodontics. (From 10 to 18 of the curriculum).

Paper- III: Clinical Orthodontics

Paper – IV: Essay

** The topics assigned to the different papers are generally evaluated under those sections. However a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.*

B. Practical / Clinical Examination : 200 Marks

Exercise No: 1 Functional Cases : 50 Marks

Selection of case for functional appliance and recording of construction bite.
Fabrication and delivery of the appliance the next day.

Exercise No: 2 Multiband exercise : 50 Marks

1. III stage with auxiliary springs.
- OR
2. Bonding of SWA brackets and construction of suitable arch wire.

**Exercise No. 3 Display of records of the treated cases (minimum of 5 cases)
5 cases * 15 marks = 75 Marks**

Exercise No: 4 long case discussions: 25 Marks

No	Exercise	Marks allotted	Approximate Time
1	Functional appliance	50	1 hour 1 hour
2	III stage mechanics / Bonding and arch wire fabrication	50	1 hr 30 min
3	Display of case records (a minimum of 5 cases to be presented with all the cases	75	1 hour
4	Long cases	25	2 hours

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.

SECTION IV TEACHING/LEARNING ACTIVITIES AND MONITORING LEARNING PROGRESS

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 helps students to evaluate themselves. The monitoring should 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.

These may include discussions, internal assessment, OSCE (Objective Structured Clinical Examination), OSPE (Objective Structured Practical Examination), DOPS (Direct Observation of Procedure Skills), Online web based exams and discussions (Using YENGAGE), Brain storming sessions, Group work and Problem oriented learning, Mock Exams and a final University exam at the end of three academic years.

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

i) Acquisition of Knowledge

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

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

Symposium: It is recommended to hold symposiums on topics covering multiple disciplines
Clinical Society Meetings: The CSMs should be held once in a month involving the faculties in Oral Medicine and Radiology, Oral Pathology and concerned clinical departments. The PG student should be encouraged to present the clinical details, radiological, and histo-pathological interpretations, and participation in the discussion. All departments should attend CSMs.

Interdepartmental meetings: To bring in more integration among various specialities, interdepartmental meetings are recommended, chaired by the dean, with all heads of post graduate departments, at least once a month.

ii)Clinical skills

Day to Day work: Skills in outpatient and ward work should be assessed periodically. The assessment should include the candidate's sincerity and punctuality, analytical ability and communication skills.

Clinical meetings : Candidates should periodically present cases to his peers and faculty members. This should be assessed using a check list.

Clinical and Procedural skills : The candidate should be given graded responsibility to enable learning by apprenticeship. The performance is assessed by the guide by direct observation.

iii)Teaching skills: All the candidates shall be encouraged to take part in undergraduate teaching programs, either in the form of lectures or group discussions. This performance should be based on assessment by the faculty members of the department and from feedback from the undergraduate students.

iv)Periodic tests: The concerned departments may conduct three tests, two of them be annual tests, one at the end of first year and the other in the second year. The third test may be held three months before the final examination. The tests may include written papers, practicals / clinicals and viva voce.

v) Work Diary / Log Book: Every candidate shall maintain a work diary and record his/her participation in the training programmes conducted by the department such as journal reviews, seminars, etc. Special mention may be made of the presentations by the candidate as well as details of clinical or laboratory procedures, if any conducted by the candidate.

vi)Records: Records, log books and marks obtained in tests will be maintained by the Head of the Department and will be made available to the University or DCI.

vii)Continuing Dental Education programmes: Each postgraduate department is recommended to organize these programs on regular basis involving other institutions. The trainees shall also be encouraged to attend such programs conducted elsewhere.

viii)Conferences / workshops / advance courses: The trainee shall be encouraged not only to attend conferences/workshops/advanced courses, but also to present at least 2 papers at state, national specialty meetings during their training period.

ix)Dissertation: Every candidate shall prepare a dissertation based on the clinical or experimental work or any other study conducted by them under the supervision of the post graduate guide.

x)Log book: The log book is a record of the important activities of the candidates during the training, Internal assessment should be based on the evaluation of the log book. Collectively, log books are a tool for the evaluation of the training programme by external agencies. The record includes academic activities as well as the presentations carried out by the candidate.

xi)Procedure for defaulters: Every department should have a committee to review such situations. The defaulting candidate is counseled by the guide and head of the department. In extreme cases of default the departmental committee may recommend that defaulting candidate be withheld from appearing the examination, if she/he fails to fulfill the requirements in spite of being given adequate chances to set himself or herself right.

TRAINING OF THE TRAINERS OF THE POST GRADUATES:

The Guides are constantly being encouraged to undergo further refinement in their academics to make them up-to-date by the University. They are expected to do presentations in national and international platforms. They are made to undertake Continuing Dental Education programmes in a regular basis. Workshops are conducted for the training of the trainers. Departmental meetings are conducted in a monthly basis to evaluate the progress of their Post Graduates. Clinical Society meetings are arranged every month to develop an interdisciplinary rapport.

Section V

Ethics in Dentistry

Introduction: There is a definite shift now from the traditional patient and doctor relation and delivery of dental care. With the advances in science and technology and the increase needs of the patient, their families and community, there is a concern for the health of community as a whole. There is a shift to greater accountability to the society. specialists like the other health professionals are confronted with many ethical problems is therefore absolutely necessary for each and every one in the health care delivery to prepare themselves to deal with these problems. To accomplish this and develop human values, it is desired that all the trainees undergo ethical sensitization by lectures or discussion on ethical issues, discussion of cases with an important ethical component.

Course Content:

Introduction to ethics -

- What is ethics?
- What are values and norms?
- How to form a value system in one's personal and professional life? Hippocratic oath.

- Declaration of Helsinki, WHO declaration of Geneva, International code of ethics,
- D.C.I. Code of ethics.

Ethics of the individual -

- The patient as a person.
- Right to be respected
- Truth and confidentiality
- Autonomy of decision
- Doctor Patient relationship

Professional Ethics-

- Code of conduct
- Contract and confidentiality
- Charging of fees, fee splitting
- Prescription of drugs
- Over-investigating the patient
- Malpractice and negligence

Research Ethics -

Animal and experimental research/humanness
 Human experimentation
 Human volunteer research-informed consent for trials
 Drug trials
 Ethical workshop of cases
 Gathering all scientific factors
 Gathering all value factors
 Fortifying areas of value - conflict, setting of priorities
 Working out criteria towards decisions

Recommended Reading:

1. Francis CM., Medical Ethics, 2nd Edn, 2004, Jaypee Brothers, New Delhi, Rs 150/.
2. Ethical Guidelines for Biomedical Research on Human Subjects, Indian Council of Medical Research, New Delhi, 2000.

Recommended Books:

1. WILLIAM R. PROFFIT, Contemporary Orthodontics
2. GRABER & VANARSDALL, Orthodontics - Current Principles & Techniques
3. MOYERS, Text Book of Orthodontics
4. GRABER, Orthodontics Principles and practice.
5. GRABER, PETROVIC, & RAKOSI Dentofacial Orthopedics with Functional Appliances
6. ATHENASIOU E ATHENASIOU, Orthodontic cephalometry
7. JACOBSON, Radiographic Cephalometry
8. RAKOSI, An Atlas and Manual of Cephalometric Radiography
9. ENLOW, Handbook of Facial Growth
10. EPKER & FISH, Dentofacial Deformities Vol. 1
11. PROFFIT & WHITE, Surgical Orthodontic Treatment
12. NANDA, Biomechanics in Clinical Orthodontics
13. NANDA & BURSTONE, Retention and Stability in Orthodontics
14. OKESON, Management of T.M. Disorders and Occlusion
15. LOU NORTON & DAVIDOWITZ, Biology of tooth movement
16. GERHARD PFIEFER, Craniofacial Abnormalities and clefts of the lip, Alveolus and Palate.
17. OKESON, TMJ Disorders.

References

1. L. JOHNSTON, New Vistas in Orthodontics
2. LEE GRABER, Orthodontics - State of the Art
3. The Essence of Science
4. NIKOLAI, Bio Engineering Analysis of Orthodontic Mechanics
5. M. RAKOSI & GRABER, A Color Atlas of Dental Medicine
6. BURSTONE, Modern Edgewise Mechanics and Segmented Arch Technique
7. W J CLARK, The Twin Block Functional Therapy
8. McNAMARA & BRUDON, Mixed Dentition
9. R D ROBLEE, Interdisciplinary Dentofacial Therapy
10. NANDA, The Developmental Basics of Occlusion and Malocclusion

Journals

	Journal Name	SJR IMPACT FACTOR	H INDEX
1	Journal of clinical orthodontics : JCO	0.279	33
2	World Journal of Orthodontics	0.315	18
3	Indian Journal of Dental Research	0.255	28
4	Orthodontics: The Art and Practice of Dentofacial Enhancement	0.276	6
5	Contemporary Clinical Dentistry	0.202	5
6	Journal of Interdisciplinary and Multidisciplinary Research	0.101	2
7	International Journal of Orthodontics	0.126	7
8	Kathmandu University Medical Journal	0.184	19
9	Journal of Oral Implantology	0.65	40
10	Journal of the World Federation of Orthodontists	0.243	4
11	Journal of Contemporary Dental Practice	0.23	32
12	Journal of Conservative Dentistry	0.618	15
13	Advances in dental research	0.23	53
14	Journal of Pharmacy and Bioallied Sciences	0.297	20
15	Journal of Computational Methods in Sciences and Engineering	0.171	14

Journals not mentioned in SJR

- 1 Latin American Journal of Orthodontics
- 2 Latin American Journal of Orthodontics and Paediatrics
- 3 Journal of Indian Orthodontic Society
- 4 Journal of Dentistry, Tehran
- 5 International journal of dental clinics
- 6 Journal of oral health and community dentistry
- 7 Biomedicine
- 8 Journal of Dental Studies and Review
- 9 Journal of Indian Society of Paedodontics and Preventive Dentistry
- 10 Anatomica Karnataka
- 11 Clinical Pearl
- 12 Journal of IDA
- 13 Advanced Engineering Forum
- 14 Universal Research Journal of Dentistry
- 15 Global Journal of Medical Research
- 16 APOS Publications
- 17 Archives Medicine and Health Sciences
- 18 Virtual Journal of Orthodontics
- 19 Universal research journal of dentistry

- 20 Journal of Orthodontic Research
- 21 Unique Journal of Medical and Dental Sciences
- 22 Journal of International Oral Health
- 23 APOS Trends in Orthodontics
- 24 Cukurova Medical Journal
- 25 Annals of Medical and Health Sciences Research
- 26 International journal of preventive and clinical dental research
- 27 International Journal of Oral Care & Research
- 28 Global Journal of Medical Research Dentistry and Otolaryngology
- 29 Asian Pacific Orthodontic Society
- 30 International Multidisciplinary Research
- 31 Archives of Medicine and Health Sciences