

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



Master of Dental Surgery (MDS)
Orthodontics and Dentofacial Orthopaedics

Course Code: 245

(2021-2022 Academic year onwards
Modified as per DCI MDS Course (3rd Amendment)
Regulations 2019)

2. COURSE CONTENT

2.1 Title of course:

MDS Orthodontics and Dentofacial Orthopaedics

2.2 Objectives of course

1. Goals

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

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

2. Objectives

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

The above objectives are to be achieved by the time the candidate completes the course.

The objectives may be considered as under –

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

2.1. Knowledge

- Demonstrate an understanding of basic sciences relevant to the specialty.
- Describe the etiology, pathophysiology, principles of diagnosis and management of common problems within the specialty in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning treatment.
- Recognize the conditions that may be outside the area of specialty/competence and to refer them to an appropriate specialist.
- Update of knowledge by self-study and by attending courses, conferences and seminars relevant to specialty.
- Undertake audit; use information technology and carry out research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

2.2. Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.

- Acquire adequate skills and competence in performing various procedures as required in the specialty.

2.3. Human values, ethical practice and communication abilities

- Adopt ethical principles in all aspects of practice.
- Fostering of professional honesty and integrity.
- Deliver patient care, irrespective of social status, caste, creed, or religion of the patient.
- Develop communication skills, in particular skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of the team in congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion
- Develop attitude to seek opinion from allied medical and dental specialists as and when required

2.3 Medium of instruction:

The medium of instruction for the course shall be English.

2.4 Course outline

Orthodontics deals with the prevention, interception and correction of dentofacial anomalies and malocclusion and the harmonizing of the structures involved, so that the dental mechanisms will function in a normal way.

2.5 Duration

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

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

2.6 Subjects

The program outlined, address 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 practise basic Orthodontics and have the ability to intelligently pursue further apprenticeship towards advanced Orthodontics.

COURSE CONTENT:

The program outlined, addresses both the knowledge needed in Orthodontics and allied Medical specialties in its scope.

Spread of the Curriculum:

A.	6 months	Teaching of basic subjects including completion of pre-clinical exercises
B.	2 ½ years	Coverage of all the relevant topics in Orthodontics, clinical training involving treatment of patients and submission of dissertation. These may be divided into blocks of 6 to 8 months duration each, depending on the training policies of each institution.

At the end of First year- MDS PART-I Exam

At the end of Third year- MDS PART-II Exam

MDS PART-I:

A. Applied Basic Sciences:

Applied Anatomy:

a. Prenatal growth of head: Stages of embryonic development, origin of head, origin of face, origin of teeth.

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

c. Bone growth: Origin of bone, composition of bone, units of bone structure, schedule of Ossification, mechanical properties of bone, roentgen graphic appearance of bone

d. Assessment of growth and development: Growth prediction, growth spurts, 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. Muscles of mastication: Development of muscles, muscle change during growth, muscle function and facial development, muscle function and malocclusion

f. Development of dentition and occlusion: Dental development periods, order of tooth eruption, chronology of permanent tooth formation, periods of occlusal development, pattern of occlusion.

g. Assessment of skeletal age.

Physiology:

a. Endocrinology and its disorders: Growth hormone, thyroid hormone, parathyroid hormone, ACTH.

b. Calcium and its metabolism:

c. Nutrition-metabolism and their disorders: Proteins, carbohydrates, fats, vitamins and minerals

d. Muscle physiology:

e. Craniofacial Biology: Adhesion molecules and mechanism of adhesion

f. Bleeding disorders in orthodontics: Haemophilia

Dental Materials:

a. Gypsum products: Dental plaster, dental stone and their properties, setting reaction etc.

b. Impression materials: Impression materials in general and particularly of alginate impression material.

- c. Acrylics:* Chemistry, composition physical properties
- d. Composites:* Composition types, properties, setting reaction
- e. Banding and bonding cements:*
- f. Wrought metal alloys:* Deformation, strain hardening, annealing, recovery, recrystallization, grain growth, properties of metal alloys
- g. Orthodontic arch wires*
- h. Elastics:* Latex and non-latex elastics.
- i. Applied physics, Bioengineering and metallurgy*
- j. Specification and tests methods used for materials used in Orthodontics*
- k. Survey of all contemporary literature and recent advances in above mentioned materials.*

Genetics:

- a. Cell structure, DNA, RNA, protein synthesis, cell division
- b. Chromosomal abnormalities
- c. Principles of orofacial genetics
- d. Genetics in malocclusion
- e. Molecular basis of genetics
- f. Studies related to malocclusion
- g. Recent advances in genetics related to malocclusion
- h. Genetic counselling
- i. Bioethics and relationship to Orthodontic management of patients.

Physical Anthropology:

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

Pathology:

- a. Inflammation
- b. Necrosis

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 and publication
- e) Applied Research Methodology In Orthodontics:
 - a. Experimental design
 - b. Animal experimental protocol
 - c. Principles in the development, execution and interpretation of methodologies in Orthodontics
 - d. 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 anaesthetics hypnotics, analeptics and tranquilizers.
- Local anaesthetics, Chemotherapeutics and antibiotics.
- Vitamins: A, D, B – complex group, C & K etc.

MDS PART-II:

Paper-I: Basic Orthodontics

Orthodontic History:

- a) Historical perspective,
- b) Evolution of orthodontic appliances,
- c) Pencil sketch history of Orthodontic peers
- d) History of Orthodontics in India

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.

Etiology and Classification of Malocclusion:

- a. A comprehensive review of the local and systemic factors in the causation of malocclusion
- b. Various classifications of malocclusion

Dentofacial Anomalies:

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

Diagnostic Procedures and Treatment Planning in Orthodontics:

- a) Emphasis on the process of data gathering, synthesis and translating it into a treatment plan
- b) Indices for measuring Orthodontic treatment need based on malocclusion status, dental aesthetics and facial esthetics.
- c) Problem cases – analysis of cases and its management
- d) Adult cases, handicapped and mentally retarded cases and their special problems
- e) Critique of treated cases.
- f) Indices for measuring treatment outcomes and critical evaluation

Cephalometrics

- a) Instrumentation
- b) Image processing
- c) Tracing and analysis of errors and applications
- d) Radiation hazards
- e) Advanced Cephalometrics techniques including digital cephalometrics
- f) Comprehensive review of literature
- g) Video imaging principles and application.

Practice Management in Orthodontics:

- a. Economics and dynamics of solo and group practices
- b. Personal management
- c. Materials management

- d. Public relations
- e. Professional relationship
- f. Dental ethics and jurisprudence
- g. Office sterilization procedures
- h. Community based Orthodontics.

Paper-II: Clinical Orthodontics

Myofunctional Orthodontics:

- a. Basic principles
- b. Contemporary appliances –design, manipulation and management
- c. Case selection and evaluation of the treatment results
- d. Review of the current literature.

Dentofacial Orthopaedics:

- a. Principles
- b. Biomechanics
- c. Appliance design and manipulation
- d. Review of contemporary literature

Cleft lip and palate rehabilitation:

- a. Diagnosis and treatment planning
- b. Mechanotherapy
- c. Special growth problems of cleft cases
- d. Speech physiology, pathology and elements of therapy as applied to Orthodontics
- e. Team rehabilitative procedures.

Biology of tooth movement:

- a. Principles of tooth movement-review
- b. Review of contemporary literature
- c. Applied histophysiology of bone, periodontal ligament
- d. Molecular and ultra-cellular consideration in tooth movement

Orthodontic / Orthognathic surgery:

- a. Orthodontist's role in conjoint diagnosis and treatment planning
- b. Pre and post-surgical Orthodontics
- c. Participation in actual clinical cases, progress evaluation and post retention study
- d. Review of current literature

Ortho / Perio / Prostho/Endo inter relationship:

- a. Principles of interdisciplinary patient treatment
- b. Common problems and their management

Basic principles of mechanotherapy: includes removable appliances and fixed appliances:

- a. Design
- b. Construction
- c. Fabrication
- d. Management
- e. Review of current literature on treatment methods and results

Applied preventive aspects in Orthodontics:

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

Interceptive Orthodontics:

- a. Principles
- b. Growth guidance
- c. Diagnosis and treatment planning
- d. Therapy emphasis on:
 - Dento-facial problems
 - Arch length –Tooth size discrepancies
 - Minor surgery for Orthodontics

Evidence Based Orthodontics:**Oral health-related quality of life (OHRQoL):**

- Effect of malocclusion and various treatment modalities on OHRQoL.
- Tools to measure effect of malocclusion on OHRQoL and its psychosocial impact.

Different types of fixed Mechanotherapy:**Orthodontic Management of TMJ problems, sleep-apnoea etc.:****Retention and relapse:**

- a) Mechanotherapy – special reference to stability of results with various procedures
- b) Post retention analysis
- c) Review of contemporary literature

Recent Advances:

- a) Use of implants
- b) Lasers
- c) Application of F.E.M.
- d) Distraction Osteogenesis
- e) Invisible Orthodontics
- f) 3D imaging Digital Orthodontics, Virtual Treatment Planning
- g) CAD-CAM bracket Customization
- h) Robotic Wire Bending
- i) Accelerated Orthodontics
 - Surgical
 - Device assisted or mechanical stimulation
 - Biochemical Mediators
- j) Lingual Orthodontics

Paper-III: Essays (descriptive and analyzing type questions)**1. PRE-CLINICAL EXERCISES**

(Should be completed within 3 months)

A general outline of the type of exercise 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 braking, 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 tracings and various Analyses, also superimposition methods.
8. Fixed appliance typodont exercises.
 - 8.1. Training shall be imparted in one basic technique i.e. Standard Edgewise/Begg technique or its derivatives/Straightwire etc. with adequate exposure to other techniques.
 - 8.2. Typodont exercise.
 - 8.2.1. Band making
 - 8.2.2. Bracket positioning and placement
 - 8.2.3. Different stages in treatment appropriate to technique taught.
9. Clinical Photography – Submit album containing
 - 9.1. Basic principles of photography, details of clinical photography
 - 9.2. Camera and adjustment specifications
 - 9.3. Standard, Extra and Intra oral photographs with photographic analysis
10. Computerized imaging
11. Preparation of surgical splints, and splints for TMJ problems
12. Handling of equipments like vacuum forming appliances and hydrosolder etc.

First Year

I. Basic Pre-Clinical Exercise Work for the MDS Students:

1. CLASPS

Sl No	Exercise	Number
1	¾ Clasps	2
2	Triangular Clasps	2
3	Adam's clasp	2
4	Modification of Adam's - With Helix	2
5	Modification of Adam's - With soldered tube	2
6	Delta clasp	2
7	Southend Clasp	1

2. LABIAL BOWS

Sl No	Exercise	Number
1	Short labial bow (upper & lower)	1
2	Long labial bow (upper & lower)	1
3	Reverse loop labial bow	1
4	Fitted labial bow	1
5	Split labial bow	1

3. SPRINGS

Sl No	Exercise	Number
1	Finger spring	1
2	Double cantilever spring	1
3	Coffin spring	1
4	T spring	1

4. CANINE RETRACTORS

Sl No	Exercise	Number
1	Helical canine retractor	1 Pair

2	Palatal canine retractor	1 Pair
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5. 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 expansion screw
4	Habit breaking appliance with tongue crib
5	Oral screen and double oral screen
6	Lip bumper
7	Splint for bruxism
8	Splint Headgear
9	Catalans appliance
10	Activator
11	Bionator
12	Frankel-FR 1&2 appliance
13	Twin block
14	Lingual arch
15	TPA
16	Quad helix
17	Bonded Rapid Maxillary Expander
18	Pendulum appliance

6. SOLDERING EXERCISES

Sl No	Exercise	Number
1	Star/Comb/Christmas tree	1

7. STUDY MODEL PREPARATION

8. MODEL ANALYSIS- Mixed and permanent Dentition

9. 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
	Steiner's analysis
	Down's analysis
	Tweed analysis
	Rickett's analysis
	Burstone analysis
	Rakosi's analysis
	McNamara analysis
	Bjork analysis
Coben's analysis	

	Harvold's analysis
3	Soft tissue analysis - Holdaway and Burstone
4	Various superimposition methods

10. BASICS OF CLINICAL PHOTOGRAPHY INCLUDING DIGITAL PHOTOGRAPHY

Sl No	Exercise
1	Basic principles of photography, details of clinical photography
2	Camera and adjustment specifications
3	Standard, Extra and Intra oral photographs with photographic analysis

11. WIRE BENDING EXERCISES FOR FIXED ORTHODONTIC TREATMENT

Sl No	Exercise
1	Bonwill-Hawley diagram
2	Making of ideal-arch wire
3	First, Second and Third order bends
4	Different loops used in Edgewise technique
5	Utility arches
6	Canine Retractor(Marcotte, PG Spring & T-loop Spring)
7	Stage-I, II, III arch wire and its auxiliaries in Begg Technique
8	019 x .025 stainless steel archwires with soldered hook formation and putting reverse curves

12. 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

13. OPTIONAL EXERCISES

Sl No	Exercise
1	Essix retainer
2	Indirect bonding- Labial / lingual on typodont
3	TADs on typodont

2. 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/Orthopedic cases of his/her own. Additionally he/she should handle a minimum of 25 transferred cases. Active participation in or at least exposure to multi-disciplinary treatment is essential.

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 orthopaedic appliances like head gears, rapid maxillary expansion, NiTi expander etc.,
- Appliance for arch development such as molar distalization
- Fixed mechano therapy cases (Begg, PEA, Tip edge, Edgewise, lingual)
- Retention procedures of above treated cases.

3. 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 should be presented by each student each year.
3. **Library dissertation** to be submitted on or before the end of 10 months.
4. Protocol or synopsis for dissertation to be submitted on or before the end of six months from the date of admission.
5. **Undergraduate classes:** Around 4 - 5 classes should be handled by each post-graduate student
6. **Field survey:** To be conducted and submit 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 subjects classes
11. Internal assessment or Term paper.

Second Year:

The clinical cases taken up should be followed under the guidance of a postgraduate teacher. 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. **Undergraduate classes:** Each post-graduate student should handle around 4-5 classes.
4. **Inter-departmental meetings:** Should be held once in a month
5. **Case discussions**
6. **Field visits:** To attend dental camps and to educate the masses.
7. **Attendance in Conferences, CDEs, Workshops, etc.**
8. **Publication of Scientific Articles.**
9. **Internal assessment.**
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. More cases 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, minimum of five 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 in a month.
5. **The completed dissertation should be submitted six months before the final examination (by the end of 29th month of commencement of course)**
6. **Case discussions**
7. **Field visits:** To attend dental camps and to educate the masses.
8. **Attendance in Conferences, CDEs, Workshops, etc.**
9. **Publication of Scientific Articles**
10. **Finishing and presenting the cases taken up.**
11. **Preparation of finished cases and presenting the cases** (to be presented for the examination)
12. **Mock examination**

4. DISSERTATION

1. The protocol for dissertation should be submitted within 6 months of start of course.
2. The completed dissertation should be submitted 6 months before the final examination.
3. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects.
4. The panel of examiners should approve the dissertation before the candidate appears for the University examination.

5. MONITORING LEARNING PROGRESS

It is essential to monitor the learning progress of each candidate through continuous and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves.

The monitoring should be done by the staff of the department and participation of students in various teaching / learning activities. It may be structured assessment be done using checklists that assess various aspects. Checklists are given in Section IV.

2.7 Total number of hours

As per the instruction given by the DCI

2.8 Branches if any with definition

Orthodontics and Dentofacial Orthopaedics

2.9 Teaching learning methods

Method of Training

The training of a postgraduate student shall be full time by graded responsibilities in the management and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, case demonstrations, clinics, journal review meetings and clinical meetings. Every candidate shall be required to participate in the teaching and training

programme of undergraduate students and interns. Training should include involvement in laboratory and experimental work, and research studies.

Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

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

- **Formal Lectures** by the faculty on varied subjects including general areas and systems. Both senior and junior faculty can do this. However, the number of these classes should be maintained at low levels to encourage self-learning.
- **Symposia / Seminars** form an integral part of PG learning. A monthly symposium will generate approximate 30-35 symposia / course. These symposia can include department faculty and HODs as chairpersons and maximum involvement of both students and faculty should be ensured.
- **Clinical Discussions** form the core of PG training and can be assigned to various clinical units on rotating basis. However other faculty could also actively participate in the discussion. The discussions must be 3-4/week. One suggestion is to score the performance of the candidate by a small panel of faculty and convey the scores to the candidate / PG at the end of the session.
- **Journal Club /Clinical Club** should be conducted at least once in a week in each postgraduate department. Journal clubs not only imparts new information but also trains the candidate to objectively assess and criticize various articles which come out and should be useful in ensuring evidence based dentistry.
- **Guest Lectures** can be integrated into the PG program at least once in a month. Even the retired faculty can be invited for delivering the lectures and will ensure importing of greater wisdom to the candidates.
- **Orientation Classes** for newcomers should also be incorporated. These classes can even be assigned to junior faculty/senior PGs.
- **Clinical posting** Each PG student should work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by a specialist.
- **Clinico Pathological Conferences** should be held once a year involving the faculties of Oral Medicine and Radiology, Oral Pathology and concerned clinical department. The student should be encouraged to present the clinical details, radiological and histopathological interpretations and participation in the discussions.
- **Rotation postings in other departments** should be worked out by each department in order to bring in more integration between the speciality and allied fields.
- **Periodical Quiz** can be both informative and entertaining and should be encouraged and planned.
- **Computer Training and Internet Applications** are now becoming a must for both faculty and students. These areas should be strengthened as a next step. There can be a sort of internet information club in the departments.
- **Conferences/CDEs** – All postgraduate students should be encouraged to attend conferences and CDEs. They should also be asked to present papers wherever appropriate and should be rewarded by assigning scores for them.

- **Publication of scientific papers** – It is desirable and advisable to have at least two publications in the State/National/International indexed dental journals.
- **Involvement in Teaching Activity** – PG students can be assigned the job of teaching the undergraduate students and these will definitely improve the teaching skills in the postgraduate students.

2.10 Content of each subject in each year

Present in clause 2.6

2.11 No: of hours per subject

Present in clause 2.6

2.12 Practical training

Present in clause 2.6

2.13 Records

Present in clause 2.21

2.14 Dissertation: As per Dissertation Regulations of KUHS

Every candidate pursuing MDS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation. The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

Every candidate shall submit to the University in the prescribed format a synopsis containing particulars of proposed dissertation work after obtaining ethical clearance from the Institutional Ethical Committee **within six months from the date of commencement of the course or before the dates notified by the University**. The synopsis shall be sent only through the Principal of the institution. Such synopsis will be reviewed and the dissertation topic will be registered by the university. No change in the dissertation topic or guide/coguide shall be made without prior approval of the University. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects.

The dissertation should be written under the following headings:

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

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires, and other annexures. It should be neatly typed (font size 13-Times New Roman or font size 13-Cambria) in 1.5 line spacing on one side of the paper (A4 size, 8.27” x 11.69”) and bound properly. Spiral binding should be avoided.

(Refer Section V and VII). The guide, co-guide if any, Head of the Department and the Head of the Institution shall certify the dissertation. For uniformity, it was suggested that the colour of the hard bind of the dissertation for all branches of MDS course in the purview of KUHS shall be dark brown with letters of gold colour. The title, author, and year of study should also be imprinted or embossed on the spine of the book. **Three hard copies and one properly labelled soft copy in a CD (refer Section VII) of the dissertation thus prepared shall be submitted to KUHS on the 29th month of commencement of the course / 31st Oct. of the 3rd academic year whichever falls first.** Dissertation should preferably be sent to a minimum of three reviewers / examiners / assessors, of which two shall be from outside the state and one from the affiliated colleges of KUHS. Consent for acceptance for evaluation of dissertation should be obtained from the reviewer/examiner/assessor before the dissertation are despatched.

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

Approval of dissertation work is an essential precondition for a candidate to appear in the final University examination. Hall tickets for the Part II examination should be issued to the candidate only if the dissertation has been accepted.

A candidate whose dissertation has been accepted by the examiners and approved by the University, but who is declared to have failed at the final examination will be permitted to reappear at the subsequent MDS examination without having to prepare a dissertation.

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

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

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

2.15 Speciality training if any

Present in clause 2.6

2.16 Project work to be done if any

Present in clause 2.6

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

Present in clause 2.6

2.18 Prescribed/recommended textbooks for each subject**Applied Basic Sciences**

Subject	Author	Title
Anatomy	BD Chaurasia	BD Chaurasia's Human Anatomy
	William, Peter L	Grays Anatomy
Oral Anatomy	Ash, Major M	Wheeler's Dental Anatomy, Physiology and Occlusion
	Sicher, Harry, Du Brull, Llyod	Oral Anatomy
Oral Histology	Bhaskar B.N. Ed	Orban's Oral Histology and Embryology
	Avery, James K	Essentials of Oral Histology and Embryology
Embryology	Sadler	Langman's Medical Embryology
	Inderbeer Singh	Human Embryology
Physiology	Guyton Arthur and John LHall	Text Book of Medical Physiology
	Ganong, William F	Review of Medical Physiology
Pharmacology	KD Tripathi	Essentials of Medical Pharmacology
	Hardman, Joel G	Goodman and Gillman's pharmacological basis of Therapeutics
Nutrition	Nizel	Nutrition in Preventive Dentistry: Science and Practice
General Pathology	Cotran, Ramzi S and Others	Robbins Pathologic Basis of Disease
	Harsh Mohan	Textbook of Pathology
Oral Pathology	Shaffer, William and Others	Textbook of Oral Pathology
	Neville, Brad W and Others	Oral and Maxillofacial Pathology
Microbiology	Ananthanarayan and Panicker	Textbook of Microbiology
	Lakshman S	Essential Microbiology for Dentistry
Biostatistics	Dr. Syamalan	Statistics in Medicine
	Soben Peter	Essentials of Preventive and Community Dentistry
	Sunder Rao and Richard J.	Introduction to Biostatistics and Research Methods

Orthodontics and Dentofacial Orthopaedics

SI No	Author	Title
1.	William R.Proffit	Contemporary Orthodontics
2.	Graber & Vanarsdall	Orthodontics - Current Principles & Techniques
3.	Moyers	Handbook of Orthodontics
4.	Graber	Orthodontics: Principles and practice
5.	Graber, Petrovic&Rakosi	Dentofacial Orthopaedics with Functional Appliances
6.	Athenasious E Athenasiou	Orthodontic cephalometry
7.	Alexander 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.	Louis Norton & Burstone	Biology of tooth movement
16.	Gerhard Pfeifer	Craniofacial Abnormalities and clefts of the lip, Alveolus and Palate.
17.	Okeson	TMJ Disorders.
18.	McLaughlin, Bennett And Trevesi	Systemized Orthodontic Treatment Mechanics
19.	V.P Jayade	Refined Begg for Modern Times
20.	Nanda	Temporary anchorage devices in Orthodontics
21.	Vinod Krishnan, Ze'evDavidovitch	Biological Mechanisms of Tooth Movement
22.	Vinod Krishnan,Ze'evDavidovitch	Integrated Clinical Orthodontics
23.	William J Clark	Twin Block Functional Therapy – Applications in Dentofacial Orthopedics
24.	Farhad B Naini	Facial Aesthetics : Concepts and Clinical Diagnosis

2.19 Reference Books

SI No	Author	Title
1	L. Johnston	New Vistas in Orthodontics
2	Lee Graber	Orthodontics - State of the Art- The Essence of Science
3	Nikolai	Bio Engineering Analysis of Orthodontic Mechanics
4	M. Rakosi& Graber	Color Atlas of Dental Medicine:Orthodontic Diagnosis
5	Burstone	Modern Edgewise Mechanics and The Segmented Arch Technique
6	McNamara &Brudon	Orthodontic and Orthopedic Treatment in the Mixed Dentition
7	R D Roblee	Interdisciplinary Dentofacial Therapy
8	Nanda	The Developmental Basics of Occlusion and Malocclusion
9	Timms	Rapid Maxillary Expansion
10	Williams & Cook	Fixed Orthodontic Appliances:Principles& Practice

11	Ricketts	Bioprogressive Therapy
12	Van Der Linden	Quintessence Series
13	Michigan Center	Craniofacial Growth Series for human growth and Development
14	J.A.Salzmann	Practice of Orthodontics Vol I and II
15	RohitSachdeva	Orthodontics for the next millennium
16	Peter Schwindling	The Jasper Jumper Color Atlas
17	Robert Ricketts	Provocations and perceptions in Craniofacial Orthopedics
18	Peter Miles & D Rinchuse	Evidence-Based Clinical Orthodontics
19	Greg Huang & Stephen Richmond	Evidence-Based Orthodontics

2.20 Journals

1. American Journal of Orthodontics and Dentofacial Orthopedics
2. Journal of Orthodontics (formerly British Journal of Orthodontics)
3. Angle Orthodontist
4. Journal of Clinical Orthodontics
5. The Journal of Indian Orthodontic Society
6. Seminars in Orthodontics
7. Journal of Orthodontics and Dentofacial Orthopaedics
8. European Journal of Orthodontics
9. Australian Journal of Orthodontics
10. International Journal of Adult Orthodontics and Orthognathic surgery
11. TheFunctional Orthodontist.
12. Journal of world federation of Orthodontists.
13. The journal of Contemporary Orthodontics.
14. Journal of the Asian Pacific Orthodontic Society (APOS Trends in Orthodontics)

2.21 Logbook

Work Diary / Log Book

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/operations observed/assisted/performed by him/her during the training period right from the point of entry and its authenticity shall be assessed weekly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination.

The logbook should record clinical cases seen and presented, procedures and tests performed, seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. A work diary containing all the various treatment done by the candidate in the course of the study should also be maintained. The work diary shall be scrutinized and certified by both the guide/co guide and Head of the Department and presented in the University practical/clinical examination (Format given in Annexures)

3. EXAMINATIONS

Examinations

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

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

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

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

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

3.1 Eligibility to appear for exams

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

MDS Part I Examination

- **Attendance**

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

- **Library Dissertation**

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

MDS Part II (Final) Examination

Attendance

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

Dissertation

Approval of the dissertation is mandatory requirement for a candidate to appear for the university examinations.

Pass in MDS Part I Examination

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

Progress and Conduct

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

Work Diary and Logbook

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

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

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

3.2 Schedule of Regular/Supplementary exams

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

3.3 Scheme of examination showing maximum marks and minimum mark

The MDS examination shall consist of theory, practical / clinical examination, and Viva-voce and Pedagogy

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

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

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

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

Part-II Examination: Shall consist of

(i) Theory - three papers, namely:—Paper I, Paper II & Paper III, each of three hours duration.

(ii) Practical and Clinical Examination;

(iii) Viva-voce and Pedagogy.

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

Theory: (Total 400 Marks)

(1) Part I University Examination (100 Marks):-

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

(2) Part II (3 papers, each of 100 Marks):-

(i) Paper-I: 2 long essay questions of 25 marks each and 5 short essays of 10 marks each.
(Total of 100 Marks)

(ii) Paper-II: 2 long essay questions of 25 marks each and 5 short essays of 10 marks each.
(Total of 100 Marks)

(iii) Paper III: 2 out of 3 essay questions (2 x 50 = 100 Marks)

Practical and Clinical Examination: 200 Marks

Viva-Voce and Pedagogy: 100 Marks

Written Examination (Theory): 400 Marks

Theory:

There shall be two theory examinations for the MDS course.

Part-I: Applied Basic Sciences -100 Marks

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

Part II Theory/Written examination: 300 Marks

The Part II theory examination shall be conducted at the end of Third year of MDS course and consist of three papers, each of three hours duration. Each paper shall carry 100 marks. The type of questions in the first two papers will be two long essay questions carrying 25 marks each and five short essay questions each carrying ten marks. There will be no options in the questions in the first 2 papers. Third paper will be an essay question paper with three essay questions carrying 50 marks each and the candidate is to answer any two of the essays. Questions on recent advances may be asked in any or all the papers. The syllabus for the theory papers of the concerned specialty should cover the entire field of the subject. Though the topics assigned to the different papers are generally evaluated under designated papers, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics. The theory examinations shall be held sufficiently earlier than the practical/clinical examinations to facilitate evaluation of the answer books. The total marks for the Part II theory examination shall be 300.

Practical and Clinical Examination: 200 Marks

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

Viva-Voce: 100 Marks

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 is to 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.

3.4 Papers in each year

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

PART-I: Applied Basic Sciences:

Applied anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology, Applied Research methodology, Bio-Statistics and Applied Pharmacology.

PART-II

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 Orthodontics

Paper II: Clinical Orthodontics

Paper III:Essays (descriptive and analyzing type questions)

3.5 Details of theory exams

MDS Part I

Paper-I: Applied Basic Sciences:

Applied anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology, Applied Research methodology, Bio-Statistics and Applied Pharmacology.

MDS Part II

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 Orthodontics

Paper II: Clinical Orthodontics

Paper III: Essay – Descriptive and analyzing type of question with emphasis on recent advances

3.6 Model Question Papers

Model Question Papers
MDS Part I Examinations
MDS – Orthodontics and Dentofacial Orthopaedics

Paper I – Applied Basic Sciences: Applied anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology,

Applied Research methodology, Bio-Statistics and Applied Pharmacology.

Answer all questions

Time 3 hours

Maximum marks:100

Essays

(10 x 10 = 100 marks)

1. Discuss growth rotation of the jaws and its clinical relevance in Orthodontic treatment.
2. Discuss the role of abnormal and normal respiration on the development of the craniofacial complex.
3. Drugs and its effect on tooth movement.
4. Discuss bonding agents from orthodontic point of view. Add a note on recent advances.
5. Fluorides in orthodontics.
6. Sampling Errors
7. Aesthetic wires
8. Ricketts Growth prediction
9. Genetic Counselling
10. Calcium metabolism

MDS Part II Examination

MDS 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 Orthodontics

Answer all questions

Time 3 hours

Max Marks 100

Essays

(2 x 25=50 marks)

1. Discuss Orthodontic treatment for the “special needs” child.
2. What are the advantages of digital imaging over conventional? Enumerate the various digital imaging- methods. Describe CBCT technology.

Short essays

(5 x 10= 50 marks)

3. Etiology of canine impaction
4. Orthodontic triage
5. Informed consent
6. COGS Analysis
7. Arch forms

MDS Part II Examinations

MDS – Orthodontics and Dentofacial Orthopaedics

Paper II – Clinical Orthodontics

Answer all questions

Time 3 hours

Max Marks 100

Long Essays (2 x 25 = 50 marks)

1. Discuss the management of deep bite in Preadjusted Edgewise Appliance system.
2. Discuss the role of Orthodontist in cleft palate rehabilitation.

Short essays (5 x 10 = 50 marks)

3. Biomechanics of incisor intrusion
4. Orthodontic treatment of diabetic patients
5. Role of Orthodontist in Obstructive sleep Apnoea
6. Dougherty's objectives of finishing and detailing
7. The Alt-RAMEC protocol

MDS Part II Examinations
MDS – Orthodontics and Dentofacial Orthopaedics
Paper III-Essay
Answer any TWO questions

Time 3 hours

Max Marks 100

1. Discuss the impact of Orthodontic treatment on OHRQoL (Oral Health Related Quality of Life) quoting appropriate references (50 marks)
2. Periodontally Accelerated Osteogenic Orthodontics. (50 marks)
3. Lingual orthodontics (50 marks)

3.7 Internal assessment component

Not applicable.

3.8 Details of practical/clinical exams to include Duration Marks Types of cases/questions

Practical / Clinical Examination: 200 Marks

Exercise No: 1 Functional Case: 50 Marks

Selection of case for functional appliance with case discussion and recording of construction bite.

Fabrication and delivery of the appliance the next day with chair side viva.

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 along with patients

(Minimum of 5 cases) 5 cases x 15 marks = 75 Marks

(Including seminars, thesis, Library dissertation, certificates of conferences, courses, paper publications etc)

Exercise No: 4-Long case discussions: 25 Marks

Time allotted for each exercise:

No	Exercise	Marks Allotted	Approximate Time
1	Functional appliance	50	1 hour (each day)
2	III stage mechanics/ Bonding and arch wire fabrication	50	1 hour 30 minutes
3	Display of case records (a minimum of 5 finished cases to be presented with patients and all the records)	75	1 hour
4	Long case -1	25	2 hours

Note: The complete records of all the cases should be displayed (including transferred cases)

Viva Voce: 100 Marks

Viva Voce – Total 100 (80 marks for the grand viva and 20 marks for pedagogy)

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.

3.9 Number of examiners needed (Internal & External) and their qualifications

Part I Examination:

The University shall appoint one internal and one external examiner of the same specialty for evaluating the Part I answer scripts. The Part I answer papers shall be evaluated by external and internal examiners of the same speciality appointed by the University adhering to the evaluators' guidelines of KUHS.

Part II Examination:

There shall be at least four examiners in each branch of study. Out of four, two (50%) should 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 the DCI. The external examiners shall ordinarily be invited from another recognized University from outside the state. An external examiner may ordinarily be appointed for the same institute for not more than two years consecutively. Thereafter he may be reappointed after an interval of one year. The same set of examiners shall ordinarily be responsible for the practical and oral part of the examination.

The Head of the Department shall ordinarily be one of the examiners and the chairperson of the Board of Examinations; second internal examiner shall rotate after every two consecutive examinations if there are more than two postgraduate teachers in the department other than the Head of the department. No person who is not an active Postgraduate teacher in that subject can be appointed as Examiner. However in case of retired personnel, a teacher who satisfies the above conditions could be appointed as examiner up to one year after retirement.

For the MDS examination, if there are no two qualified internal examiners in an institute the second internal examiner can be from a neighbouring DCI and KUHS approved / recognized Dental College having PG course in the specific speciality. This examiner should be an active PG teacher in the same speciality with the qualifications and experience recommended for a teacher for postgraduate degree programme. The examination can also be conducted by one qualified internal examiner and three qualified external examiners if there is no qualified second internal examiner.

Reciprocal arrangement of Examiners should be discouraged, in that, the internal examiner in a subject should not accept external examinership of a college from which the external examiner is appointed in his subject in the same academic year.

3.10 Details of viva

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 and thesis presentation: 10 +10 = 20 marks

4. INTERNSHIP

Not applicable in PG courses

5.ANNEXURES

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

5.1:Checklist 1

Model Checklist for Evaluation of Preclinical Exercises

Name of Student:

Date:

Name of the Faculty:

Name of Exercise:

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

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

Signature of Faculty

5.2: Checklist 2

Model Checklist for Evaluation of Journal Review / Seminar Presentation

Name of Student:

Date:

Name of the Faculty:

Name of Journal / Seminar:

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

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

Signature of Faculty

5.3: Checklist 3

Model Checklist for Evaluation of Clinical Case and Clinical Work

Name of Student:

Date:

Name of the Faculty:

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

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

Signature of Faculty

5.4: Checklist 4

Model Checklist for Evaluation of Library Dissertation Work

Name of Student:

Date:

Name of the Faculty/Guide:

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

Signature of Faculty

5.5: Checklist 5

Model Checklist for Evaluation of Dissertation Work

Name of Student:

Date:

Name of the Faculty/Guide/Co-guide:

Sl. No:	Items for observation during evaluation	Score
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide/co-guide	
Performance	Depth of analysis/Discussion	Score
Poor	Ability to respond to questions	0
Below Average	Organization Presentation of findings	1
Average	Quality of final output	2
Good	TOTAL SCORE	3
Very good		4

Signature of Faculty

5.6: CHECKLIST- 6

CONTINUOUSEVALUATION OF DISSERTATION WORK BY GUIDE/CO-GUIDE

Name of the Trainee:

Date:

Name of the Faculty

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

Signature of the guide / co-guide

5.7: CHECKLIST - 7

OVERALL ASSESSMENT SHEET

Name of the College:

Date:

Name of Department:

Signature of HOD

Signature of Principal

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

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

Key:

Mean score: Is the sum of all the scores of checklists 1 to 6

5.8: LOG BOOK

DEPARTMENT OF

MDS Programme

LOG BOOK OF

NAME.....

BIODATA OF THE CANDIDATE

EXPERIENCE BEFORE JOINING P.G. COURSE

DETAILS OF POSTING:

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

DETAILS OF LEAVE AVAILED

PRECLINICAL EXERCISES

LIBRARY DISSERTATION

RESEARCH WORK

PARTICIPATION IN CONFERENCES – CDE PROGRAMMES

DETAILS OF PARTICIPATION IN ACADEMIC PROGRAMME

SEMINARS /SYMPOSIA PRESENTED

JOURNAL CLUBS

TEACHING ASSIGNMENTS – UNDERGRADUATES / PARAMEDICAL.

SPECIAL DUTIES (IF ANY)

INTERNAL ASSESSMENT

DAILY ACTIVITIES RECORD (BLANK PAGES)

ONE PAGE FOR EACH MONTH X 36 PAGES

MISCELLANEOUS

SUMMARY

5.8.1: LOG BOOK-1

ACADEMIC ACTIVITIES ATTENDED

Name:

Admission Year:

College:

College:

Date	Topic	Type of activity - Specify Seminar, Journal club, Presentation, UG teaching

Signature of the guide / co-guide

5.8.3: LOG BOOK - 3

DIAGNOSTIC AND THERAPEUTIC PROCEDURES PERFORMED

Name:

Admission Year:

College:

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

Signature of the guide / co-guide

Annexure: 5.9

Faculty

- In each department there should be a minimum required full time faculty members belonging to the disciplines concerned with requisite postgraduate qualification and experience for being a PG teacher as prescribed by the DCI. The requirements of the faculty should follow the norms framed by the DCI.
- To strengthen and maintain the standards of postgraduate training, DCI and KUHS recommends the following minimum faculty requirements (Table 1) for starting and

continuation of postgraduate training programmes. Any increase of admissions will also be based on the same pattern.

Table 1: Minimum Faculty Requirements

Unit 1

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

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

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

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

3. Unit 2:-

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

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

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

Clinical / Laboratory Facilities and Equipments

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