

11. Instruction should be given in dental jurisprudence, legal and ethical obligations of dental practitioners and the constitution and functions of Dental Council of India.
12. Infection and cross infection control assume significance in dental practice. The students should be made aware of the potential risk of transmission in the dental surgery, various infectious diseases particularly HIV and hepatitis. The students should be aware of their professional responsibility for the protection of the patients, themselves and their staff and the requirements of the health and safety regulations.
13. In the recent times, the subjects of esthetic dentistry, oral implantology, behavioural sciences and forensic odontology have assumed great significance. Hence, the Council recommends that these four specialities should be incorporated into the undergraduate curriculum. The instruction and clinical training in aesthetic dentistry shall be carried out by the departments of Conservative, Endodontics & Aesthetic Dentistry and prosthodontics, Crown Bridge, Aesthetic Dentistry and Oral Implantology. Similarly, the instruction and clinical training in oral implantology shall be done by the departments of Oral & Maxillofacial Surgery, Prosthodontics, Crown Bridge, Aesthetic Dentistry and Oral Implantology and Periodontology and Oral Implantology. The instruction in behavioural sciences should ideally commence before the students come in contact with the patients and shall be carried out by the departments of Public Health Dentistry & Preventive Dentistry and Pedodontics & Preventive Dentistry. Forensic Odontology will be a part of Oral Pathology & Oral Microbiology and Oral Medicine and Radiology.

### **COMPETENCIES — BDS**

At the completion of the undergraduate training programme the graduates shall be competent in the following:-

#### **General Skills**

- Apply knowledge & skills in day to day practice
- Apply principles of ethics
- Analyze the outcome of treatment
- Evaluate the scientific literature and information to decide the treatment
- Participate and involve in professional bodies
- Self assessment & willingness to update the knowledge & skills from time to time
- Involvement in simple research projects
- Minimum computer proficiency to enhance knowledge and skills
- Refer patients for consultation and specialized treatment
- Basic study of forensic odontology and geriatric dental problems

#### **Practice Management**

- Evaluate practice location, population dynamics & reimbursement mechanism
- Co-ordinate & supervise the activities of allied dental health personnel
- Maintain all records
- Implement & monitor infection control and environmental safety programs
- Practice within the scope of one's competence

#### **Communication & Community Resources**

- Assess patients goals, values and concerns to establish rapport and guide patient care
- Able to communicate freely, orally and in writing with all concerned
- Participate in improving the oral health of the individuals through community activities.

#### **Patient Care – Diagnosis**

- Obtaining patient's history in a methodical way
- Performing thorough clinical examination
- Selection and interpretation of clinical, radiological and other diagnostic information
- Obtaining appropriate consultation
- Arriving at provisional, differential and final diagnosis

#### **Patient Care – Treatment Planning**

- Integrate multiple disciplines into an individual comprehensive sequence treatment plan using diagnostic and prognostic information
- Able to order appropriate investigations

#### **Patient Care – Treatment**

- Recognition and initial management of medical emergencies that may occur during Dental treatment
- Perform basic cardiac life support
- Management of pain including post operative
- Administration of all forms of local anaesthesia
- Administration of intra muscular and venous injections
- Prescription of drugs, pre operative, prophylactic and therapeutic requirements



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Uncomplicated extraction of teeth  
 Transalveolar extractions and removal of simple impacted teeth  
 Minor oral surgical procedures  
 Management of Oro-facial infections  
 Simple orthodontic appliance therapy  
 Taking, processing and interpretation of various types of intra oral radiographs  
 Various kinds of restorative procedures using different materials available  
 Simple endodontic procedures  
 Removable and fixed prosthodontics  
 Various kinds of periodontal therapy

#### **ORAL MEDICINE & RADIOLOGY**

- Able to identify precancerous and cancerous lesions of the oral cavity and refer to the concerned speciality for their management
- Should have an adequate knowledge about common laboratory investigations and interpretation of their results.
- Should have adequate knowledge about medical complications that can arise while treating systemically compromised patients and take prior precautions/ consent from the concerned medical specialist.
- Have adequate knowledge about radiation health hazards, radiations safety and protection.
- Competent to take intra-oral radiographs and interpret the radiographic findings
- Gain adequate knowledge of various extra-oral radiographic procedures, TMJ radiography and sialography.
- Be aware of the importance of intra- and extra-oral radiographs in forensic identification and age estimation
- Should be familiar with jurisprudence, ethics and understand the significance of dental records with respect to law

#### **PAEDIATRIC & PREVENTIVE DENTISTRY**

- Able to instill a positive attitude and behaviour in children towards oral health and understand the principles of prevention and preventive dentistry right from birth to adolescence.
- Able to guide and counsel the parents in regards to various treatment modalities including different facets of preventive dentistry.
- Able to treat dental diseases occurring in child patient.
- Able to manage the physically and mentally challenged disabled children effectively and efficiently, tailored to the needs of individual requirement and conditions.

#### **ORTHODONTICS & DENTOFACIAL ORTHOPAEDICS**

- Understand about normal growth and development of facial skeleton and dentition.
- Pinpoint aberrations in growth process both dental and skeletal and plan necessary treatment
- Diagnose the various malocclusion categories
- Able to motivate and explain to the patient (and parent) about the necessity of treatment
- Plan and execute preventive orthodontics (space maintainers or space regainers)
- Plan and execute interceptive orthodontics (habit breaking appliances)
- Manage treatment of simple malocclusion such as anterior spacing using removable appliances
- Handle delivery and activation of removable orthodontic appliances
- Diagnose and appropriately refer patients with complex malocclusion to the specialist

#### **PERIODONTOLOGY**

- Diagnose the patients periodontal problem, plan and perform appropriate periodontal treatment
- Competent to educate and motivate the patient
- Competent to perform thorough oral prophylaxis, subgingival scaling, root planning and minor periodontal surgical procedures
- Give proper post treatment instructions and do periodic recall and evaluation
- Familiar with concepts of osseointegration and basic surgical aspects of implantology

#### **PROSTHODONTICS AND CROWN & BRIDGE**

- Able to understand and use various dental materials
- Competent to carry out treatment of conventional complete and partial removable dentures and fabricate fixed partial dentures
- Able to carry out treatment of routine prosthodontic procedures.
- Familiar with the concept of osseointegration and the value of implant-supported Prosthodontic procedures

#### **CONSERVATIVE DENTISTRY AND ENDODONTICS**

- Competent to diagnose all carious lesions
- Competent to perform Class I and Class II cavities and their restoration with amalgam
- Restore class V and Class III cavities with glass ionomer cement
- Able to diagnose and appropriately treat pulpally involved teeth (pulp capping procedures)
- Able to perform RCT for anterior teeth
- Competent to carry out small composite restorations
- Understand the principles of aesthetic dental procedures



**ORAL & MAXILLOFACIAL SURGERY**

- Able to apply the knowledge gained in the basic medical and clinical subjects in the management of patients with surgical problems
- Able to diagnose, manage and treat patients with basic oral surgical problems
- Have a broad knowledge of maxillofacial surgery and oral implantology
- Should be familiar with legal, ethical and moral issues pertaining to the patient care and communication skills
- Should have acquired the skill to examine any patient with an oral surgical problem in an orderly manner
- Understand and practice the basic principles of asepsis and sterilisation
- Should be competent in the extraction of the teeth under both local and general anaesthesia
- Competent to carry out certain minor oral surgical procedure under LA like trans-alveolar extraction, frenectomy, dento alveolar procedures, simple impaction, biopsy, etc.
- Competent to assess, prevent and manage common complications that arise during and after minor oral surgery
- Able to provide primary care and manage medical emergencies in the dental office
- Familiar with the management of major oral surgical problems and principles involved in the in-patient management

**PUBLIC HEALTH DENTISTRY**

- Apply the principles of health promotion and disease prevention
- Have knowledge of the organization and provision of health care in community and in the hospital service
- Have knowledge of the prevalence of common dental conditions in India.
- Have knowledge of community based preventive measures
- Have knowledge of the social, cultural and env. Factors which contribute to health or illness.
- Administer and hygiene instructions, topical fluoride therapy and fissure sealing.
- Educate patients concerning the aetiology and prevention of oral disease and encourage them to assure responsibility for their oral health.

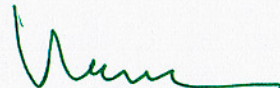
**MINIMUM WORKING HOURS FOR EACH SUBJECT OF STUDY**  
**(B.D.S COURSE)**

The following has been substituted in terms of (3rd Amendment) notification published on 25<sup>th</sup> August, 2011 in the Gazette of India and the same is as under:-

Subjects	Lecture Hours	Practical Hours	Clinical Hours	Total Hours
General Human Anatomy Including Embryology, Osteology and Histology.	100	175		275
General Human Physiology	120	60		180
Biochemistry	70	60		130
Dental Materials	80	240		320
Dental Anatomy Embryology, and Oral Histology	105	250		355
Dental Pharmacology & Therapeutics	70	20		90
General Pathology	55	55		110
Microbiology	65	50		115
General Medicine	60		9	150
General Surgery	60		90	150
Oral Pathology & Microbiology	145	130		275
Oral Medicine & Radiology	65		200	265
Paediatric & Preventive Dentistry	65		200	265
Orthodontics & dental orthopaedics	50		200	250
Periodontology	80		200	280
Oral & Maxillofacial Surgery	70		360	430
Conservative Dentistry & Endodontics	135	200	460	795
Prosthodontics & Crown & Bridge	135	300	460	895
Public Health Dentistry	60		290	350
<b>Total</b>	<b>1590</b>	<b>1540</b>	<b>2550</b>	<b>5680</b>

**Note:**

There should be a minimum of 240 teaching days every year consisting of 8 working hours including one hour of lunch break.

  
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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 Dento-facial 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 oro-facial deformities.

#### **Attitude:**

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 and religion of the patients.
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 Dento-facial 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.

#### **COURSE CONTENT:** – *orthodontics*

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

#### **Spread of the Curriculum:**

#### **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: Hemophilia

**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 counseling
- 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

#### **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 anesthetics hypnotics, analeptics and tranquilizers. Local anesthetics, Chemotherapeutics and antibiotics. Vitamins: A, D, B – complex group, C & K etc.

### **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. 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.

##### **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 Orthopedics:**

- 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 / Prosth/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
  - Tooth material discrepancies
  - Minor surgery for Orthodontics

**Evidence Based Orthodontics:****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)****PRE – CLINICAL EXERCISES**

(Should be completed within 3 months)

A general outline of the type of exercises is given here:

1. General Wire bending exercises to develop the manual dexterity.
2. Clasps, Bows and springs used in the removable appliances.
3. Soldering and welding exercises.
4. Fabrication of removable, habit breaking, mechanical and functional appliances, also all types of space maintainers and space gainers.
5. Bonwill Hawley Ideal arch preparation.
6. Construction of orthodontic models trimmed and polished.
7. Cephalometric tracing and various Analyses, also superimposition methods –
8. Fixed appliance typodont exercises.
  - a) Training shall be imparted in one basic technique i.e. Standard Edgewise / Begg technique or its derivative / Straight wire etc., with adequate exposure to other techniques.
  - b) Typodont exercise
    - Band making
    - Bracket positioning and placement
    - 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 equipment like vacuum forming appliances and hydro solder etc.



**Basic Pre-Clinical Exercise Work for the MDS Students:****1. Clasps:**

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

**2. Labial Bows:**

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

**3. Springs:**

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

**4. Appliances:**

Sl.No.	Exercise	No.
1.	Hawley's retention appliance with anterior bite plane	1
2.	Upper Hawley's appliance with posterior bite plane	1
3.	Upper expansion appliance with expansion screw	1
4.	Habit breaking appliance with tongue crib	1
5.	Oral screen and double oral screen	1
6.	Lip bumper	1
7.	Splint for Bruxism	1
8.	Catalans appliance	1
9.	Activator	1
10.	Bionator	1
11.	Frankel-FR 1 & 2 appliance	2
12.	Twin block	1
13.	Lingual arch	1
14.	TPA	1
15.	Quad helix	1
16.	Utility arches	1
17.	Pendulum appliance	1
18.	Canine Retractor(Marcotte & PG Spring)	1

**5. Soldering exercises:**

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

**6. Study model preparation:****7. Model analysis – Mixed and permanent Dentition:**



**8. Cephalometrics:**

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

**9. Basics of Clinical Photography including Digital Photography:****10. Typodont exercises: Begg or P.E.A. method/Basic Edgewise:**

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

**CLINICAL WORK:**

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

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

The type of cases can be as follows:

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

**Scheme of examination:**

<b>A. Theory:</b> Part-I: Basic Sciences Paper	-	<b>100 Marks</b>
Part-II: Paper-I, Paper-II & Paper-III	-	<b>300 Marks</b>
		(100 Marks for each Paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & 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: \*

<b><u>PART-I:</u></b>	Applied Basic Sciences: Applied anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology, Applied Research methodology, Bio-Statistics and Applied Pharmacology.
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17. Lasers in Endodontics.
18. Multidisciplinary approach to endodontic situations.
19. Radiology and CBCT in endodontic practice.
20. Procedural errors in endodontics and their management.
21. Endodontic failures and retreatment.
22. Resorptions and its management.
23. Microscopes and Microsurgery in endodontics.
24. Single visit endodontics, current concepts and controversies.
25. Regenerative Endodontics

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

**TEACHING / LEARNING ACTIVITIES:** *conservative*

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

The following is the minimum required to be completed before the candidate can be considered eligible to appear for final MDS exam.

**First Year**

● **Pre Clinical Work – Conservative and Endodontics**

● **Preclinical work on typhodont teeth**

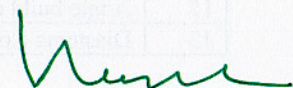
1. Class II amalgam cavities
  - a. Conservative preparation - 03
  - b. Conventional preparation - 03
2. Inlay cavity preparation including wax pattern and casting on premolars and molars – MO, DO, MOD - 02
3. Onlay preparation on molars including wax pattern and casting - 02
4. Full Crown
  - a. Anterior - 02
  - b. Posterior - 02
 (1 each to be processed)

● **Pre Clinical work on natural teeth**

1. Wax Carving of all permanent teeth
2. Inlay on molars and premolars MO, DO, and MOD including wax pattern and casting - 05
3. Amalgam cavity preparation
  - a. Conventional - 02
  - b. Conservative - 02
4. Complex amalgam on molar teeth - 02
5. Onlay on molars including wax pattern and casting (1 to be processed) - 02
6. Full crown premolars and molars (metal, PFM & Ceramic) - 04
7. Full crown anterior (PFM, composite & Ceramic) - 03
8. Veneers anterior teeth - 02
9. Composite
  - a. Composite Filling (Class I,II,III & V) -05 (each)
  - b. Inlay (Class I & II) -02
  - c. Veneer -02
  - d. Diastema Closure -02
  - e. Angle Buildups -02

**Endodontics:**

1. Sectioning of all maxillary and mandibular teeth (vertical & horizontal).



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2. Access cavity opening in relation to maxillary and mandibular permanent teeth.
3. Access cavity preparation, BMP and Obturation
  - a) Anterior (3 maxillary and 3 mandibular) - 06
    - Conventional prep - 02
    - Step back - 02
    - Crown down - 02
    - Obturation - 03
    - (2 lateral compaction and 1 thermoplasticized)
  - b) Premolar - 04
    - (2 upper and 2 lower) obturation 1 each
  - c) Molar - 06
    - (3 upper - 2 first molars and 1 second molar
    - 3 lower - 2 first molars and 1 second molar) obturation 1 each
4. Post and core preparation and fabrication in relation to anterior and posterior teeth
  - a. Anterior 10 (Cast Post 5 and prefabricated post 5)
  - b. Posterior 05 (Cast Post 2 and prefabricated post 5)
5. Removable dies - 04

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

**Clinical Work:**

A	Composite restorations	30
B	GIC Restorations	30
C	Complex amalgam restorations	05
D	Composite inlay + veneers (direct and indirect)	10
E	Ceramic jacket crowns	05
F	Post and core for anterior teeth	10
G	Bleaching vital	05
	Non vital	05
H	RCT Anterior	20
I	Endo surgery - observation and assisting	05

**Presentation of:**

- Seminars - 5 seminars by each student - should include topics in dental materials, conservative dentistry and endodontics
- Journal clubs - 5 by each student
- Submission of synopsis at the end of 6 months
- Library assignment work
- Internal assessment - theory and clinicals.

**Second Year**

**Case discussion- 5**

1	Ceramic jacket crowns	10
2	Post and core for anterior teeth	10
3	Post and core for posterior teeth	05
4	Composite restoration	15
5	Full crown for posterior teeth	15
6	Cast gold inlay	05
7	Other special types of work such as splinting - Reattachment of fractured teeth etc.	10
8	Anterior RCT	30
9	Posterior RCT	40
10	Endo surgery performed independently	05
11	Management of endo - Perio problems	05
12	Angle build up composite	05
13	Diastema closure	05



14	Composite Veneers	05
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- Under graduate teaching program as allotted by the HOD
- Seminars – 5 by each student
- Journal club – 5 by each student
- Dissertation work
- Prepare scientific paper / poster and present in conference and clinical meeting
- Library assignment to be submitted 18 months after starting of the course
- Internal assessment – theory and clinical

### Third Year

Dissertation work to be submitted 6 months before final examination.

### Clinical work

- Cast gold inlay- Onlay, cuspal restoration 10
- Post and core 20
- Molar endodontics 50
- Endo surgery 05
- Diastema Closure 05
- Angle Build up 05
- All other types of surgeries including crown lengthening, perioesthetics, hemi sectioning, splinting, replantation.

### Presentation of:

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

### Monitoring Learning Progress:

It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV.

### Scheme of Examination:

A. Theory: 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 Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & 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-I :** Applied Basic Sciences: Applied Anatomy, Physiology, Pathology including Oral Microbiology, Pharmacology, Biostatistics and Research Methodology and Applied Dental Materials.

### PART-II

Paper-I	:	Conservative Dentistry
Paper-II	:	Endodontics
Paper-III	:	Essays (descriptive and analyzing type questions)



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- Anesthesiology: Evaluation of patients for GA technique, general anesthetic drugs use and complications, management of emergencies, various IV sedation techniques.
- Plastic Surgery- Basic Principles

**TEACHING / LEARNING ACTIVITIES:**

O. Surgery

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

**I Year**

Study of applied basic sciences including practicals (wherever necessary), basic computer sciences, exodontia, seminars on basic topics, selection of dissertation topic, library assignment topic, attending O.T, ward rounds, Medical Record keeping, Pre-clinical exercises, preparation of synopsis and its submission within the six months after admission to the university as per calendar of events.

**Rotation and postings in other departments:**

General medicine	- 1 month
General surgery	- 1 month
Ophthalmology	- 15 days
Neuro Surgery	- 15 days
ENT	- 15 days
Orthopedic	- 15 days
Plastic Surgery	- 15 days
Casualty	- 15 days
Anesthesia (ICU)	- 15 days
Radiology (CT, MRI, USG)	- 15 days

**II Year**

- Minor oral surgery and higher surgical training
- Submission of library assignment
- Oncology posting - 1 month

**III Year**

- Maxillofacial surgery
- Submission of dissertation to the university, six months before the final examination.

It is desirable to enter general surgical skills and operative procedures that are observed, assisted or performed in the log book in the format as given below:-

Sl.No	Procedure	Category	Number
1	Injection I.M. and I.V.	PI	50, 20
2	Minor suturing and removal of sutures	PI	N,A
3	Incision & drainage of an abscess	PI	10
4	Surgical extraction	PI	15
5	Impacted teeth	PI, A	30,20
6	Pre prosthetic surgery- corrective procedures ridge extension ridge reconstruction	PI A A	10 3 3
7	OAF closure	PI, A	3,2
8	Cyst enucleation	PI,A	5,5
9	Mandibular fractures	PI,A	10,10
10	Peri-apical surgery	PI,A	5
11	Infection management	PI,A	3,3
12	Biopsy procedures	PI, A	10, 3
13	Removal of salivary calculi	A	3
14	Benign tumors	A	3,3

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15	mid face fractures	PI,A	3,5
16	Implants	PI,A	5,5
17	Tracheotomy	A	2
18	Skin grafts	PI,A	2,2
19	Orthognathic surgery	A,O	3,5
20	Harvesting bone & cartilage grafts	A,O	3,5
	Iliac crest	A,O	3,3
	Rib	A,O	2,2
	Calvarial	A,O	2,2
	Fibula	A	3
21	T.M. Joint surgery	A,O	3,5
22	Jaw resections	A,O	3,3
23	Onco surgery	A,O	2,2
24	Micro vascular anastomosis	A,O	3,5
25	Cleft lip & palate	A,O	2,3
26	Distraction osteogenesis	A,O	2,3
27	Rhinoplasty	A,O	1,3
28	Access osteotomies and base of skull surgeries		
29	Emergency Management for OMFS Patients in Casualty / Accident & Emergency	PI,O	5,5

PI:- Performed Independently

A:- Assisted

O:- Observed

#### Monitoring Learning Progress:

It is essential to monitor the learning progress to each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV.

#### Paper wise distribution of syllabus:

##### PART-I:

Applied Basic Sciences

##### PART-II:

Paper-I: Minor Oral Surgery and Maxillofacial Trauma

##### Minor Oral Surgery:

- **Principles of Surgery:** Developing A Surgical Diagnosis, Basic Necessities For Surgery, Aseptic Technique, Incisions, Flap Design Tissue Handling, Haemostasis, Dead Space Management, Decontamination And Debridement, Suturing, Oedema Control, Patient General Health And Nutrition.
- **Medical Emergencies:** Prevention and management of altered cons-ciousness (syncope, orthostatic hypotension, seizures, diabetes mellitus, adrenal insufficiency), hypersensitivity reactions, chest discomfort, and respiratory difficulty.
- **Examination and Diagnosis:** Clinical history, physical and radiographic, clinical and laboratory diagnosis, oral manifestations of systemic diseases, implications of systemic diseases in surgical patients.
- **Haemorrhage and Shock:** Applied physiology, clinical abnormalities of coagulation, extra vascular hemorrhage, and hemorrhagic lesions, management of secondary hemorrhage, shock.



- **Exodontia:** Principles of extraction, indications and contraindications, types of extraction, complications and their management, principles of elevators and elevators used in oral surgery.
- **Impaction:** Surgical anatomy, classification, indications and contraindications, diagnosis, procedures, complications and their management.
- **Surgical aids to eruption of teeth:** Surgical exposure of unerupted teeth, surgical repositioning of partially erupted teeth.
- **Transplantation of teeth**
- **Surgical Endodontics:** Indications and contraindications, diagnosis, procedures of periradicular surgery
- **Preprosthetic Surgery:** Requirements, types (alveoloplasty, tuberosity reduction, mylohyoid ridge reduction, genial reduction, removal of exostosis, vestibuloplasty)
- **Procedures to Improve Alveolar Soft Tissues:** Hypermobility tissues- operative / sclerosing method, epulis fissuratum, frenectomy and frenotomy
- **Infections of Head and Neck:** Odontogenic and non Odontogenic infections, factors affecting spread of infection, diagnosis and differential diagnosis, management of facial space infections, Ludwig angina, cavernous sinus thrombosis.
- **Chronic infections of the jaws:** Osteomyelitis (types, etiology, pathogenesis, management) osteoradionecrosis
- **Maxillary Sinus:** Maxillary sinusitis – types, pathology, treatment, closure of Oro – antral fistula, Caldwell- luc operation
- **Cysts of the Orofacial Region:** Classification, diagnosis, management of OKC, dentigerous, radicular, non Odontogenic, ranula
- **Neurological disorders of the Maxillofacial Region:** Diagnosis and management of trigeminal neuralgia, MPDS, bell's palsy, Frey's syndrome, nerve injuries.
- **Implantology:** Definition, classification, indications and contraindications, advantages and disadvantages, surgical procedure.
- **Anesthesia**  
Local Anesthesia:  
 Classification of local anesthetic drugs, mode of action, indications and contra indications, advantages and disadvantages, techniques, complications and their management.  
General Anesthesia:  
 Classification, stages of GA, mechanism of action, indications, and contra indications, advantages and disadvantages, post anesthetic complications and emergencies, anesthetic for dental procedures in children, pre medication, conscious sedation, legal aspects for GA

### Maxillofacial Trauma:

- Surgical Anatomy of Head and Neck.
- Etiology of Injury.
- Basic Principles of Treatment
- Primary Care: resuscitation, establishment of airway, management of hemorrhage, management of head injuries and admission to hospital.
- Diagnosis: clinical, radiological
- Soft Tissue Injury of Face and Scalp: classification and management of soft tissue wounds, injuries to structure requiring special treatment.
- Dento Alveolar Fractures: examination and diagnosis, classification, treatment, prevention.
- Mandibular Fractures: classification, examination and diagnosis, general principles of treatment, complications and their management
- Fracture of Zygomatic Complex: classification, examination and diagnosis, general principles of treatment, complications and their management.
- Orbital Fractures: blow out fractures
- Nasal Fractures
- Fractures of Middle Third of the Facial Skeleton: emergency care, fracture of maxilla, and treatment of Le fort I, II, III, fractures of Naso orbito ethmoidal region.
- Ophthalmic Injuries: minor injuries, non-perforating injuries, perforating injuries, retro bulbar hemorrhage, and traumatic optic neuropathy.
- Traumatic Injuries To Frontal Sinus: diagnosis, classification, treatment
- Maxillofacial Injuries in Geriatric and Pediatric Patients.
- Gun Shot Wounds and War Injuries

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- Osseointegration in Maxillofacial Reconstruction
- Metabolic Response to Trauma: neuro endocrine responses, inflammatory mediators, clinical implications
- Healing of Traumatic Injuries: soft tissues, bone, cartilage, response of peripheral nerve to injury
- Nutritional consideration following Trauma.
- Tracheostomy: indications and contraindications, procedure, complications and their management.

#### **Paper – II :Maxillofacial Surgery**

- a) **Salivary gland**
  - Sialography
  - Salivary fistula and management
  - Diseases of salivary gland – developmental disturbances, cysts, inflammation and sialolithiasis
  - Mucocele and Ranula
  - Tumors of salivary gland and their management
  - Staging of salivary gland tumors
  - Parotidectomy
- b) **Temporomandibular Joint**
  - Etiology, history signs, symptoms, examination and diagnosis of temporomandibular joint disorders
  - Ankylosis and management of the same with different treatment modalities
  - MPDS and management
  - Condylectomy – different procedures
  - Various approaches to TMJ
  - Recurrent dislocations – Etiology and Management
- c) **Oncology**
  - Biopsy
  - Management of pre-malignant tumors of head and neck region
  - Benign and Malignant tumors of Head and Neck region
  - Staging of oral cancer and tumor markers
  - Management of oral cancer
  - Radical Neck dissection
  - Modes of spread of tumors
  - Diagnosis and management of tumors of nasal, paranasal, neck, tongue, cheek, maxilla and mandible
  - Radiation therapy in maxillofacial regions
  - Lateral neck swellings
- d) **Orthognathic surgery**
  - Diagnosis and treatment planning
  - Cephalometric analysis
  - Model surgery
  - Maxillary and mandibular repositioning procedures
  - Segmental osteotomies
  - Management of apertognathia
  - Genioplasty
  - Distraction osteogenesis
- e) **Cysts and tumors of oro facial region**
  - Odontogenic and non-Odontogenic tumors and their management
  - Giant Cell lesions of jawbone
  - Fibro osseous lesions of jawbone
  - Cysts of jaw
- f) **Laser surgery**
  - The application of laser technology in surgical treatment of lesions



- g) **Cryosurgery**
  - Principles, applications of cryosurgery in surgical management
- h) **Cleft lip and palate surgery**
  - Detailed knowledge of the development of the face, head and neck
  - Diagnosis and treatment planning
  - Current concepts in the management of cleft lip and palate deformity
  - Knowledge of Naso endoscopy and other diagnostic techniques in the evaluation of speech and hearing
  - Concept of multidisciplinary team management
- i) **Aesthetic facial surgery**
  - Detailed knowledge of the structures of the face and neck including skin and underlying soft tissue
  - Diagnosis and treatment planning of deformities and conditions affecting facial skin
  - Underlying facial muscles, bone, Eyelids, external ear
  - Surgical management of post acne scarring, facelift, blepharoplasty, otoplasty, facial bone recontouring, etc
- j) **Craniofacial surgery**
  - Basic knowledge of developmental anomalies of the face, head and neck
  - Basic concepts in the diagnosis and planning of various head and neck anomalies including facial clefts, craniosynostosis, syndromes, etc.
  - Current concept in the management of Craniofacial anomalies

**Paper – III : Essays (descriptive and analyzing type questions)**

**Scheme of Examination:**

<b>A. Theory:</b> Part-I: Basic Sciences Paper	-	<b>100 Marks</b>
Part-II: Paper-I, Paper-II & Paper-III	-	<b>300 Marks</b>
		(100 Marks for each Paper)

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & 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-I** : Applied Basic Sciences: Applied Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.

**PART- II**

**Paper – I** : Minor Oral Surgery and Maxillofacial Trauma

**Paper – II** : Maxillofacial Surgery

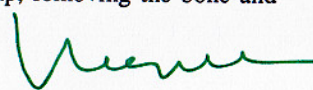
**Paper – III** : Essays (descriptive and analyzing type questions)

*\*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**

**1. Minor Oral Surgery** - **100 Marks**

Each candidate is required to perform the minor oral surgical procedures under local anaesthesia. The minor surgical cases may include removal of impacted lower third molar, cyst enucleation, any similar procedure where students can exhibit their professional skills in raising the flap, removing the bone and suturing the wound.

  
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## 2. Results of periodontal treatment

## (iv) ORAL IMPLANTOLOGY

1. Introduction and historical review
2. Biological, clinical and surgical aspects of dental implants
3. Diagnosis and treatment planning
4. Implant surgery
5. Prosthetic aspects of dental implants
6. Diagnosis and treatment of Peri implant complications
7. Special emphasis on plaque control measures in implant patients
8. Maintenance phase

## (v) MANAGEMENT OF MEDICAL EMERGENCIES IN PERIODONTAL PRACTICE

Periodontology treatment should be practiced by various treatment plans and more number of patients to establish skill for diagnosis and treatment and after care with bio-mechanical, biological, bio-esthetics, bio-phonetics and all treatment should be carried out in more number for developing clinical skill.

**TEACHING / LEARNING ACTIVITIES:** - *Periodontology*

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

S.No.	Year Wise	ACTIVITIES WORKS TO BE DONE
1.	<b>Module 1 (First Year)</b>	<p>Orientation to the PG program</p> <p><b>Pre-clinical work (4 months)</b></p> <p><b>a. Dental</b></p> <ol style="list-style-type: none"> <li>1. Practice of incisions and suturing techniques on the typodont models.</li> <li>2. Fabrication of bite guards and splints.</li> <li>3. Occlusal adjustment on the casts mounted on the articulator</li> <li>4. X-ray techniques and interpretation.</li> <li>5. Local anaesthetic techniques.</li> <li>6. Identification of Common Periodontal Instruments.</li> <li>7. To learn science of Periodontal Instruments maintenance (Sharpening, Sterilization and Storage)</li> <li>8. Concept of Biological width</li> </ol> <p><b>a. Typodont Exercise</b></p> <ol style="list-style-type: none"> <li>(i) Class II Filling with Band and Wedge Application</li> <li>(ii) Crown cuttings</li> </ol> <p><b>b. Medical</b></p> <ol style="list-style-type: none"> <li>1. Basic diagnostic microbiology and immunology, collection and handling of sample and culture techniques.</li> <li>2. Introduction to genetics, bioinformatics.</li> <li>3. Basic understanding of cell biology and immunological diseases.</li> </ol> <p><b>Clinical work</b></p> <ol style="list-style-type: none"> <li>1. Applied periodontal indices 10 cases</li> <li>2. Scaling and root planning:- with Proper written history               <ol style="list-style-type: none"> <li>a. Manual 20 Cases</li> <li>b. Ultrasonic 20 Cases</li> </ol> </li> <li>3. Observation / assessment of all periodontal procedures including implants</li> </ol>
2.	<b>Module 2 (First Year)</b>	<ol style="list-style-type: none"> <li>1. Interpretation of various bio-chemical investigations.</li> <li>2. Practical training and handling medical emergencies and basic life support devices.</li> <li>3. Basic biostatistics – Surveying and data analysis.</li> </ol>

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		<b>Clinical</b> <ol style="list-style-type: none"> <li>1. Case history and treatment planning 10 cases</li> <li>2. Root planning 50 cases</li> <li>3. Observation / assessment of all periodontal procedures including implant.</li> <li>4. Selection of topic for Library dissertation and submission of Dissertation Synopsis.</li> </ol>
3.	<b>Module 3 (First Year)</b>	Minor surgical cases 20 cases (i) Gingival Depigmentation 3 Cases (ii) Gingival Curettage no limits (iii) ENAP 1 Case (iv) Gingivectomy/ Gingivoplasty 5 cases (v) Operculectomy 3 cases Poster Presentation at the Speciality conference
4.	<b>Module 4 (Second Year)</b>	<b>Clinical work</b> <ol style="list-style-type: none"> <li>1. Case history and treatment planning 10 cases</li> <li>2. Occlusal adjustments 10 cases</li> <li>3. Perio splints 10 cases</li> <li>4. Local drug delivery techniques 5 cases</li> <li>5. Screening cases for dissertation</li> </ol>
5.	<b>Module 5 (Second Year)</b>	<ol style="list-style-type: none"> <li>1. Periodontal surgical procedures.               <ol style="list-style-type: none"> <li>a. Basic flap procedures 20 cases</li> <li>2. Periodontal plastic and esthetic 10 cases</li> <li>a. Increasing width of attached gingival 5 cases</li> <li>b. Root coverage procedures / Papilla Preservation and Reconstruction 5 cases</li> <li>c. Crown lengthening procedures 5 cases</li> <li>d. Frenectomy 5 cases</li> <li>e. Vestibuloplasty 5 cases</li> </ol> </li> <li>3. Furcation treatment (Hemisection, Rootsection, Tunelling) 5 cases</li> <li>4. Surgical closure of diastema. 2 cases</li> </ol>
6.	<b>Module 6 (Third Year)</b>	<ol style="list-style-type: none"> <li>1. Ridge augmentation procedures 5 cases</li> <li>2. Implants Placements and monitoring 5 cases</li> <li>3. Sinus lift procedures 2 cases</li> <li>4. Case selection, preparation and investigation of implants.</li> <li>5. Interdisciplinary Periodontics 2 each               <ol style="list-style-type: none"> <li>(i) Ortho - Perio</li> <li>(ii) Endo - Perio</li> <li>(iii) Restorative Perio</li> <li>(iv) Preprosthetic</li> <li>(v) Crown Prep</li> </ol> </li> <li>6. Osseous Surgery 2 each               <ol style="list-style-type: none"> <li>(i) Resective</li> <li>(ii) Regenerative</li> </ol> </li> <li>7. Scientific paper/ poster presentation at the conference.</li> </ol>
7.	<b>Module 7 (Third Year)</b>	<b>Clinical work</b> <ol style="list-style-type: none"> <li>1. Flap surgeries &amp; regenerative techniques 25 cases (using various grafts &amp; barrier membranes)</li> <li>2. Assistance / observation of advanced surgical procedure 5 each</li> <li>3. Micro Surgery 5 each</li> <li>4. Record maintenance &amp; follow-up of all treated cases including implants.</li> <li>5. Submission of dissertation - 6 months before completion of III year.</li> <li>6. Scientific paper presentation at conferences.</li> </ol>



8.	<b>Module 8 (Third Year)</b>	1. Refining of surgical skills. 2. Publication of an article in a scientific journal. 3. Preparation for final exams.
9.	<b>Module 9 (Third Year)</b>	1. Preparation for final exams. 2. University exam

**Note: Maintenance of Work Diary / Check list / Log books as prescribed.**

#### **ASSESSMENT EXAMINATION:**

In addition to regular evaluation, log book etc., Assessment examination should be conducted after every 3 modules & progress of the student monitored.

#### **MONITORING LEARNING PROGRESS:**

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

#### **SCHEME OF EXAMINATION:**

**A. Theory: 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 Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & 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-I :** Applied Basic Sciences: Applied Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.

#### **Part-II**

**Paper I:** Normal Periodontal structure, Etiology & Pathogenesis of Periodontal diseases, epidemiology as related to Periodontics

**Paper II:** Periodontal diagnosis, therapy & Oral Implantology

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

*\*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**

The clinical examination shall be of two days duration

#### **1<sup>st</sup> day**

Case discussion

- Long case - One
- Short case - One

Periodontal surgery – Periodontal Surgery on a previously prepared case after getting approval from the examiners

#### **2<sup>nd</sup> day**

Post-surgical review and discussion of the case treated on the 1<sup>st</sup> day

Presentation of dissertation & discussion

All the examiners shall participate in all the aspects of clinical examinations / Viva Voce

  
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- Occlusal adjustment procedures – Reversible – occlusal stabilization splints and physical therapies, jaw exercises, jaw manipulation and other physiotherapy or irreversible therapy – occlusal repositioning appliances, orthodontic treatment, Orthognathic surgery, fixed and removable prosthodontic treatment and occlusal adjustment, removable prosthodontic treatment and occlusal adjustment. Indication for occlusal adjustment, special nature of orofacial pain, Psychopathological considerations, occlusal adjustment philosophies, mandibular position, excursive guidance, occlusal contact scheme, goals of occlusal adjustment, significance of a slide in centric, Preclinical procedures, clinical procedures for occlusal adjustment.

## VI. ESTHETICS

### SCOPE, DEFINITIONS :

**Morpho psychology and esthetics, structural esthetic rules** –facial components, dental components, gingival components and physical components. Esthetics and its relationship to function – Crown morphology, physiology of occlusion, mastication, occlusal loading and clinical aspect in bio esthetic aspects, Physical and physiologic characteristic and muscular activities of facial muscle, perioral anatomy and muscle retaining exercises Smile – classification and smile components, smile design, esthetic restoration of smile, Esthetic management of the dentogingival unit, intraoral materials for management of gingival contours, and ridge contours, Periodontal esthetics, Restorations – Tooth colored restorative materials, the clinical and laboratory aspects, marginal fit, anatomy, inclinations, form, size, shape, color, embrasures & contact point.

Prosthodontic treatment should be practiced by developing skills, by treating various and more number of patients to establish skill to diagnose and treatment and after care with bio-mechanical, biological, bio-esthetics, bio-phonetics. All treatments should be carried out in more numbers for developing clinical skills.


- Infection control, cross infection barrier – clinical & lab ; hospital & lab waste management

### Teaching / Learning Activities: – *Prosthodontics*

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

#### **I YEAR M.D.S.**

- Theoretical exposure of all applied sciences
- *Pre-clinical* exercises involved in prosthodontic therapy for assessment
- Commencement of library assignment within six months
- To carry out short epidemiological study relevant to prosthodontics.
- Acquaintance with books, journals and referrals.
- To differentiate various types of articles published in and critically appraise based on standard reference guidelines.
- To develop the ability to gather evidence from published articles.
- To acquire knowledge of published books, journals and websites for the purpose of gaining knowledge and reference – in the field of *Oral and Maxillofacial Prosthodontics and Implantology*
- Acquire knowledge of instruments, equipment, and research tools in Prosthodontics.
- To acquire knowledge of Dental Material Science – Biological and biomechanical & bio-esthetics, knowledge of using material in laboratory and clinics including testing methods for dental materials.
- Submit a protocol for their dissertation before Institutional Review Board and Institutional Ethics Committee.

  
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- Participation and presentation in seminars, didactic lectures.

## II YEAR M.D.S.

- Acquiring confidence in obtaining various phases and techniques in removable and fixed prosthodontics therapy
- Acquiring confidence by clinical practice with sufficient number of patients requiring tooth and tooth surface restorations
- Fabrication of adequate number of complete denture prosthesis following, higher clinical approach by utilizing semi-adjustable articulators, face bow and graphic tracing.
- Understanding the use of dental surveyor and its application in diagnosis and treatment plan in R.P.D.
- Adequate number of R.P.D's covering all partially edentulous situations.
- Adequate number of Crowns, Inlays, laminates, **FDP ( fixed dental prosthesis)** covering all clinical situations.
- Selection of cases and following principles in treatment of partially or complete edentulous patients by implant supported prosthesis.
- Treating single edentulous arch situations by implant supported prosthesis.
- Diagnosis and treatment planning for implant prosthesis.
- Ist stage and IInd stage implant surgery
- Understanding the maxillofacial **Prosthodontics, treating craniofacial and management of orofacial defects**
- Prosthetic management of TMJ syndrome
- Occlusal rehabilitation
- Management of failed restorations.
- Prosthodontic management of patient with psychogenic disorder.
- Practice of child and geriatric prosthodontics.
- Participation and presentation in seminars, didactic and non didactic Teaching and Training students.

## III YEAR M.D.S

- Clinical and laboratory practice continued from IInd year.
- Occlusion equilibration procedures – fabrication of stabilizing splint for parafunctional disorders, occlusal disorders and TMJ functions.
- Practice of dental, oral and facial esthetics
- The clinical practice of all aspects of Prosthodontic therapy for elderly patients.
- Implants Prosthodontics – Rehabilitation of Partial Edentulism, Complete edentulism and craniofacial rehabilitation.
- Failures in all aspects of Prosthodontics and their management and after care.
- Team management for esthetics, TMJ syndrome and Maxillofacial & Craniofacial Prosthodontics
- Management of Prosthodontic emergencies, resuscitation.
- Candidate should complete the course by attending a large number and variety of patients to master the prosthodontic therapy. This includes the practice management, examinations, treatment planning, communication with patients, clinical and laboratory techniques materials and instrumentation required in different aspects of prosthodontic therapy, Tooth and Tooth surface restoration, Restoration of root



treated teeth, splints for periodontal rehabilitations and fractured jaws, complete dentures, R.P.D's, F.D.P's,

Immediate dentures, over dentures, implant supported prosthesis, maxillofacial and body prosthesis, occlusal rehabilitation.

- Prosthetic management of TMJ syndrome
- Management of failed restorations
- Should complete and submit Main Dissertation assignment 6 months prior to examination.
- Candidates should acquire complete theoretical and clinical knowledge through seminars, symposium, workshops and reading.
- Participation and presentation in seminars, didactic lectures

### PROSTHODONTIC TREATMENT MODALITIES

- 1) Diagnosis and treatment planning prosthodontics
- 2) Tooth and tooth surface restorations
  - Fillings
  - Veneers – composites and ceramics
  - Inlays- composite, ceramic and alloys
  - Onlay – composite, ceramic and alloys
  - Partial crowns –  $\frac{3}{4}$  <sup>th</sup>,  $\frac{4}{5}$  <sup>th</sup>,  $\frac{7}{8}$  <sup>th</sup>, Mesial  $\frac{1}{2}$  crowns
  - Pin-ledge
  - Radicular crowns
  - Full crowns

### 3) Tooth replacements

	Partial	Complete
• Tooth supported	Fixed partial denture	Overdenture
• Tissue supported	Interim partial denture	Complete denture
	Intermediate partial denture	Immediate denture
• Tooth and tissue Supported	Cast partial denture	Immediate complete denture
	Precision attachment	Overdenture
• Implant supported	Cement retained	Bar attachment
	Screw retained	Ball attachment
	Clip attachment	
• Tooth and implant Supported	Screw retained	Screw retained
	Cement retained	Cement retained
• Root supported	Dowel and core	Over denture
	Pin retained	
• Precision attachments		
	Intra coronal attachments	
	Extra coronal attachments	
	Bar – slide attachments	

  
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- Joints and hinge joint attachments

#### 4) Tooth and tissue defects (Maxillo- facial and Cranio-facial prosthesis)

##### A. Congenital Defects

- a. Cleft lip and palate
- b. Pierre Robin Syndrome
- c. Ectodermal dysplasia
- d. Hemifacial microstomia
- e. Anodontia
- f. Oligodontia
- g. Malformed teeth

cast partial dentures  
implant supported prosthesis  
complete dentures  
fixed partial dentures

##### B. Acquired defects

- a. Head and neck cancer patients – prosthodontic splints and stents

- b. Restoration of facial defects
  - Auricular prosthesis

- Nasal prosthesis
- Orbital prosthesis

- Craniofacial implants

- c. Midfacial defects

- d. Restoration of maxillofacial trauma

- e. Hemimandibulectomy
- f. Maxillectomy
- Dentures
- g. Lip and cheek support prosthesis

cast partial denture  
implant supported  
complete dentures

- h. Ocular prosthesis

- i. Speech and Velopharyngeal prosthesis

- j. Laryngectomy aids

- k. Esophageal prosthesis

- l. Nasal stents

- m. Tongue prosthesis

- n. Burn stents

- o. Auditory inserts

- p. Trismus appliances

#### 5) T.M.J and Occlusal disturbances

- a. Occlusal equilibration

- b. Splints - Diagnostic  
- Repositioners / Deprogrammers

- c. Anterior bite planes

- d. Posterior bite planes

- e. Bite raising appliances



- f. Occlusal rehabilitation

**6) Esthetic/Smile designing**

- a. Laminates / Veneers
- b. Tooth contouring (peg laterals, malformed teeth)
- c. Tooth replacements
- d. Team management

**7) Psychological therapy**

- a. Questionnaires
- b. Charts, papers, photographs
- c. Models
- d. Case reports
- e. Patient counseling
- f. Behavioral modifications
- g. Referrals

**8) Geriatric Prosthodontics**

- a. Prosthodontics for the elderly
- b. Behavioral and psychological counseling
- c. Removable Prosthodontics
- d. Fixed Prosthodontics
- e. Implant supported Prosthodontics
- f. Maxillofacial Prosthodontics
- g. Psychological and physiological considerations

**9) Preventive measures**

- a. Diet and nutrition modulation and counseling
- b. Referrals

**The bench work should be completed before the start of clinical work during the first year of the MDS Course**

**I. Complete dentures**

1. Arrangements on adjustable articulator for
  - Class I
  - Class II
  - Class III
2. Various face bow transfers to adjustable articulators
3. Processing of characterized anatomical dentures

**II. Removable partial dentures**

1. Design for Kennedy's Classification (Survey, block out and design)
  - a. Class I



- b. Class II
- c. Class III
- d. Class IV
- 2. Designing of various components of RPD
- 3. Wax pattern on refractory cast
  - a. Class I
  - b. Class II
  - c. Class III
  - d. Class IV
- 4. Casting and finishing of metal frameworks
- 5. Acrylisation on metal frameworks for Class I

Class III with modification

### III. Fixed Partial Denture

1. Preparations on ivory teeth / natural teeth
  - FVC for metal
  - FVC for ceramic
  - Porcelain jacket crown
  - Acrylic jacket crown
  - PFM crown
  - 3/4<sup>th</sup> (canine, premolar and central)
  - 7/8<sup>th</sup> posterior
  - Proximal half crown
  - Inlay – Class I, II, V
  - Onlay – Pin ledged, pinhole
  - Laminates
2. Preparation of different die systems
3. Fabrication of wax patterns by drop wax build up technique
  - Wax in increments to produce wax coping over dies of tooth preparations on substructures
  - Wax additive technique
  - 3-unit wax pattern (maxillary and Mandibular)
  - Full mouth
4. Pontic designs in wax pattern
  - Ridge lap
  - Sanitary
  - Modified ridge lap
  - Modified sanitary
  - Spheroidal or conical



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## 5. Fabrication of metal frameworks

- Full metal bridge for posterior (3 units)
- Coping for anterior (3 unit)
- Full metal with acrylic facing
- Full metal with ceramic facing
- Adhesive bridge for anteriors
- Coping for metal margin ceramic crown
- Pin ledge crown

## 6. Fabrication of crowns

- All ceramic crowns with characterisation
- Metal ceramic crowns with characterisation
- Full metal crown
- Precious metal crown
- Post and core

## 7. Laminates

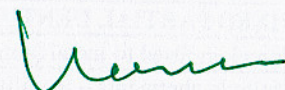
- Composites with characterisation
- Ceramic with characterisation
- Acrylic

## 8. Preparation for composites

- Laminates
- Crown
- Inlay
- Onlay
- Class I
- Class II
- Class III
- Class IV
- Fractured anterior tooth

## IV. Maxillofacial prosthesis

- Eye
- Ear
- Nose
- Face
- Body defects
  - Cranial
  - Maxillectomy
  - Hemimandibulectomy
  - Finger prosthesis
  - Guiding flange



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- Obturator

#### V. Implant supported prosthesis

1. Step by step procedures – *Surgical and* laboratory phase

#### VI. Other exercises

1. TMJ splints – stabilization appliances, maxillary and Mandibular repositioning appliances
2. Anterior disocclusion appliances
3. Chrome cobalt and acrylic resin stabilization appliances
4. Modification in accommodation of irregularities in dentures
5. Occlusal splints
6. Periodontal splints
7. Precision attachments – custom made
8. Over denture coping
9. Full mouth rehabilitation (by drop wax technique, ceramic build up)
10. TMJ appliances – stabilization appliances

#### ESSENTIAL SKILLS:

\*Key

O – Washes up and observes

A – Assists a senior

PA – Performs procedure under the direct supervision of a senior specialist

PI – Performs independently

The following list of procedures are expected of the post graduate to complete in the post graduate programme under faculty guidance [PA] or independently [PI]. Each of the following procedures should be evaluated for the competencies like critical thinking, patient centered approach, use of evidence based approach, professionalism, systems based practice approach and communication skills of the student. The mentioned numbers denote minimal requirement. However, the head of the department has the discretion to fix the quota and assess them systematically. There may be procedures which the student has observed [O] or assisted [A]. The student can however make his entry into his log book or portfolio wherein he/she can make his comments with remarks of the facilitator in the form of a feedback which would reinforce his learning.

PROCEDURE	CATEGORY			
	O	A	PA	PI
Tooth and tooth surface restoration				5
a) Composites – fillings, laminates, inlay, onlay				5
b) Ceramics – laminates, inlays, onlays				5
c) Glass Ionomer				
<b>CROWNS</b>				10
FVC for metal				10
FVC for ceramic				
Precious metal crown or Galvanoformed crown	1	-	1	5
Intraradicular crowns (central, lateral, canine, premolar, and molar)		-	-	5
Crown as implant supported prosthesis	As many	5	5	5
<b>FIXED PARTIAL DENTURES</b>				
Porcelain fused to metal (anterior and posterior)				10
Multiple abutments – maxillary and Mandibular full arch				5



Incorporation of custom made and prefabricated precision attachments			2	
Adhesive bridge for anterior/posterior		-		5
<b>CAD – CAM Anterior/Posterior FPD</b>	-	-		5
Interim provisional restorations (crowns and FPDs)				for all crowns and bridges
Immediate fixed partial dentures (interim) with ovate pontic		-	-	5
Fixed prosthesis as a retention and rehabilitation means for acquired and congenital defects – maxillofacial Prosthetics				5
Implant supported prosthesis		-		1
Implant – tooth supported prosthesis		-		1
<b>REMOVABLE PARTIAL DENTURE</b>				
Provisional partial denture prosthesis				10
Cast removable partial denture (for Kennedy's Applegate classification with modifications)				3
Removable bridge with precision attachments and Telescopic crowns for anterior and posterior edentulous Spaces				1
Immediate RPD				5
Partial denture for medically compromised and Handicapped patients				2
<b>COMPLETE DENTURES</b>				
Anatomic characterized prosthesis (by using semi adjustable articulator)	-	-		25
Single dentures	-	-		5
Overlay dentures	-	-		5
Interim complete dentures as a treatment prosthesis for abused denture supporting tissues	-	-		5
Complete denture prosthesis (for abnormal ridge relation, ridge form and ridge size)	-	-		5
Complete dentures for patients with TMJ syndromes	-	-		2
Complete dentures for medically compromised and handicapped patients	-	-		2
<b>GERIATRIC PATIENTS</b>				
Handling geriatric patients requiring nutritional counseling, psychological management and management of co-morbidity including xerostomia and systemic problems. Palliative care to elderly.				
<b>IMPLANT SUPPORTED COMPLETE PROSTHESIS</b>				
Implant supported complete prosthesis (maxillary and Mandibular)	-	-		1
<b>MAXILLOFACIAL PROSTHESIS</b>				

e.g. Guiding flange/ obturators/ Speech and palatal lift prosthesis/ Eye/ Ear/ Nose/ Face/Finger/Hand/Foot

5 different types as PI

  
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<b>TMJ SYNDROME MANAGEMENT</b>				
Splints – periodontal, teeth, jaws	-	-	1	1
TMJ supportive and treatment prosthesis	-	-	1	1
Stabilization appliances for maxilla and mandible with freedom to move from IP to CRCP	-	-	-	1
In IP without the freedom to move to CRCP	-	-	-	1
Repositioning appliances, anterior disocclusion appliances	-	-	-	1
Chrome cobalt and acrylic resin stabilization appliances for modification to accommodate for the irregularities in the dentition	-	-	-	1
Occlusal adjustment and occlusal equilibrium appliances	-	-	1	4
<b>FULL MOUTH REHABILITATION</b>				
Full mouth rehabilitation – restoration of esthetics and function of stomatognathic system	-	-	1	2
<b>INTER-DISCIPLINARY TREATMENT MODALITIES</b>				
Inter-disciplinary management – restoration of Oro craniofacial defects for esthetics, phonation, mastication and psychological comforts	-	-	1	2
<b>MANAGEMENT OF FAILED RESTORATION</b>				
Tooth and tooth surface restorations	-	-	-	5
Removable prosthesis	-	-	-	5
Crowns and fixed prosthesis	-	-	-	5
Maxillofacial prosthesis	-	-	-	2
Implant supported prosthesis	-	-	-	1
Occlusal rehabilitation and TMJ syndrome	-	-	-	2
Restoration failures of psychogenic origin	-	-	-	2
Restoration failures to age changes	-	-	-	2

**SCHEME OF EXAMINATION:**

- A. Theory:** 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 Paper (Part-I) of three hours duration and should be conducted at the end of First year of *MDS course*. *Part I examination consists of two essays of 25 marks each and 10 short answers of 5 marks each. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration. Paper-I, Paper-II and Paper III shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Distribution of topics for each paper will be as follows:*

- Part-I :** *Applied Basic Sciences: Applied Anatomy*  
 Nutrition & Biochemistry, Pathology & Microbiology, virology, Applied Dental anatomy & histology, Oral pathology & oral Microbiology, Adult and geriatric psychology. Applied dental materials.

**Part-II**

- Paper-I :** *Removable Prosthodontics and Implant supported prosthesis (Implantology), Geriatric dentistry and Cranio facial Prosthodontics*

- Paper-II :** *Fixed Prosthodontics, Occlusion, TMJ and esthetics.*

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