

## **MDS CURRICULUM**

As per MDS DCI Regulation 2017 **Objective** of training programme in Orthodontics is to structure and achieve the following four objectives

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

**Skills:** 1. To obtain proper clinical history, methodical examination of the patient, perform essential diagnostic procedures, and interpret them and arrive at a reasonable diagnosis about the 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

# MODULE 1-

## History of Orthodontics, Concepts of Normal Occlusion with emphasis on Functional Occlusion

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information regarding:</p> <ul style="list-style-type: none"> <li>• History of orthodontics in Greece, and Rome.</li> <li>• Knowledge of History in different ages.</li> <li>• Evolution of different appliances (Edgewise appliance, functional appliance, Biomaterials, etc).</li> <li>• The development of normal occlusion and effect of genetic and environmental factor on the development of the normal dentition</li> <li>• -The development of malocclusion and describe both normal and abnormal dental development</li> <li>• Discuss the factors responsible for developmental abnormalities</li> </ul>	<ul style="list-style-type: none"> <li>-Discuss the knowledge of the evolution of different appliances.</li> <li>-Integrate the literature and apply for future innovations</li> <li>-Demonstrate an assessment of the growth of dentition, craniofacial skeleton and soft tissues</li> <li>-Discuss the development process of the dentition to the patient/parent</li> <li>-Discuss the various possibilities to prevent and/ or intercept and/or to improve any developing abnormal situation</li> </ul>	<ul style="list-style-type: none"> <li>- Attend lectures / seminars within the department</li> <li>-Independent study</li> <li>-Seminars, case presentations and journal club.</li> <li>-CMEs, Conventions and Conferences.</li> <li>-Web based e-learning sources</li> </ul>	<ul style="list-style-type: none"> <li>-Written examination</li> <li>- Multiple choice question (MCQ)</li> </ul>

## **MODULE 2-**

### **Growth and development of cranium, maxilla and mandible including the growth assessment and prediction**

<b>Expected outcome</b>	<b>Intended learning objectives</b>	<b>Teaching learning Methods</b>	<b>Assessment tools</b>
<p>-This module will provide information regarding:</p> <ul style="list-style-type: none"><li>• Growth and development of cranium, maxilla and mandible and special emphasis on assessment and prediction of maxilla and mandible.</li><li>• Describe normal and abnormal facial growth and development including common malformations</li></ul>	<p>-Apply knowledge of growth and development of cranium, maxilla and mandible to the assessment and treatment of patients</p>	<p>-Attend lectures / seminars within the department</p> <p>-Independent study</p> <p>-Seminars, case presentations and journal club.</p> <p>-CMEs, Conventions and Conferences.</p> <p>-Web based e-learning sources</p>	<p>-Written examination</p> <p>-Workplace based assessment</p> <p>- Multiple choice question (MCQ)</p>

## MODULE 3-

### Classification and etiology of malocclusion, Epidemiology of Malocclusion and PAR, IOTN & ICON Indices

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provides information about :</p> <ul style="list-style-type: none"> <li>• Various types of classification of malocclusion</li> <li>• Discuss the factors (skeletal, soft tissue, local/dental) of etiology</li> <li>• Discuss specific causes of Malocclusion</li> <li>• Describe the genetic and Environmental influences on malocclusion·</li> <li>• Age, sex, ethnic group, socioeconomic status, esthetics and clinical treatment need</li> <li>• Assess the peer pressure and self Esteem</li> <li>• Understand the malocclusion severity according to indices</li> </ul>	<p>-Analyse and interprets clinical findings with respect to the etiology and diagnose the the malocclusion</p> <p>-Prepare suitable treatment plans according to the cause of the malocclusion</p> <p>- Evaluate the patients treatment needs and outcome</p> <p>-Evaluate the incorporation of these indices in treatment planning and treatment outcome</p>	<p>- Attend lectures / seminars within the department</p> <p>- Independent study</p> <p>- Seminars, case presentations and journal club.</p> <p>-CMEs, Conventions and Conferences.</p> <p>-Skill lab</p> <p>- Web based e-learning sources</p>	<p>-Written examination</p> <p>-Objective Structured Clinical Examination</p> <p>-Workplace based assessment</p> <p>- Multiple choice question (MCQ)</p>

## **MODULE 4-**

### **Research methodology**

<b>Expected outcome</b>	<b>Intended learning objectives</b>	<b>Teaching learning Methods</b>	<b>Assessment tools</b>
<p>-This module will provide information in:</p> <ul style="list-style-type: none"><li>• Various methods of critically analysing the literature</li><li>• Compiling an article or literature</li><li>• Undertaking and understand a research project leading to publication</li><li>• Describe the how to read the literature and extract the information and interpretate data to apply in clinical practice</li></ul>	<p>-Understand and apply methodology to undertake a systematic and meta review</p> <p>-Write a scientific abstract, articles</p>	<p>- Attend lectures / seminars within the department</p> <p>- Independent study</p> <p>- Seminars, case presentations and journal club.</p> <p>-CMEs, Conventions and Conferences.</p> <p>-Web based e-learning sources</p>	<p>-Written examination</p> <p>-Objective Structured Clinical Examination</p> <p>-Workplace based assessment</p> <p>-Multiple choice question (MCQ)</p>

## MODULE 5 -

### Diagnostic Procedure & Aids in Orthodontics, Physiology of stomatognathic system with special emphasis on oral habits

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"> <li>• Clinical examination</li> <li>• Radiographic examination</li> <li>• Study model analysis</li> <li>• Other supplemental diagnostic aids</li> <li>• Clinical application of different diagnostic aids</li> <li>• Clinical application of recent diagnostic aids</li> </ul> <ul style="list-style-type: none"> <li>• Osteology,myology of different</li> <li>• Muscles Interaction between osteology and mycology</li> <li>• Various mandibular movement</li> </ul> <p>-Functions of stomatognathic system-</p> <ul style="list-style-type: none"> <li>Mastication</li> <li>Deglutition</li> <li>Speech</li> <li>Respiration</li> </ul> <ul style="list-style-type: none"> <li>• Different habits</li> </ul>	<p>-Collect, interpretate and analyses clinical records and use to make clinical diagnosis.</p> <p>-Correct the wrong mandibular path to treat malocclusion</p> <p>-How to abnormal habit generate malocclusion and what are the various methods to correct it.</p>	<p>-Attend lectures / seminars within the department</p> <p>- Independent study</p> <p>-Seminars, case presentations and journal club.</p> <p>-Suitable meetings</p> <p>-CMEs, Conventions and Conferences.</p> <p>-Skill lab</p> <p>-Web based e-learning sources</p>	<p>-Written examination</p> <p>- Objective Structured Clinical Examination</p> <p>-Workplace based assessment</p> <p>- Multiple choice question (MCQ)</p>

## MODULE 6-

### Physiology of Bone with Current Concepts & its Clinical Applications, Orthodontic Tooth Movements & Current Concepts in Tissue Changes and Root resorption

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information about:</p> <ul style="list-style-type: none"> <li>• The types of bone, physiology of bone, remodelling and modelling of bone etc.</li> <li>• Understands and apply the clinical application.</li> <li>• Normal timing of eruption and exfoliation of the teeth.</li> <li>• Biology and biomechanics of tooth movement</li> <li>• Phases of tooth movement</li> <li>• Theories of tooth movement</li> <li>• Discuss the histology of tooth movement</li> <li>• Tissue changes and root resorption during orthodontic tooth movement</li> <li>• Types of rooth resorption and how to prevent it</li> </ul>	<p>-Evaluate the normal physiology of bone</p> <p>-How to alter the growth of bone and use for the treatment of malocclusion.</p> <p>-Understands the normal sequence of tooth eruption and exfoliation, and can prevent the development of malocclusion to guide the tooth to normal path of eruption</p> <p>-How to reduce root resorption</p>	<p>-Attend lectures / seminars within the department</p> <p>-Independent study</p> <p>-Seminars, case presentations and journal club.</p> <p>- Suitable meetings</p> <p>- CMEs, Conventions and Conferences.</p> <p>· Web based e-learning sources</p>	<p>- Written examination</p> <p>- Objective Structured Clinical Examination</p> <p>-Workplace based assessment</p> <p>- Multiple choice question (MCQ)</p>



# MODULE 7-

## Cephalometrics Analyses (Basic, Anterio-posterior, vertical, PA and soft tissue)

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"> <li>• Basics of cephalometric</li> <li>• Different Cephalometric analyses</li> <li>• Superimposition techniques for lateral cephalogram</li> <li>• Growth analysis</li> <li>• Evaluate the pre and post treatment changes.</li> <li>• Use of different superimposition techniques</li> </ul>	<p>-How to locate the landmarks</p> <p>-Construction of various planes</p> <p>-Understands the various cephalometric analyses.</p> <p>-Interpret the superimposition.</p> <p>-Evaluate the accuracy of superimposition techniques.</p> <p>.Differentiate the effect of growth and mechanics by superimposition.</p>	<p>-Attend lectures / seminars within the department</p> <p>-Independent study</p> <p>- Seminars, case presentations and journal clubs.</p> <p>-Suitable meetings</p> <p>- CMEs, Conventions and Conferences.</p> <p>.Skill lab</p> <p>· Web based e-learning sources</p>	<p>-Written examination</p> <p>-Objective Structured Clinical Examination</p> <p>-Workplace based assessment</p> <p>-Multiple choice question (MCQ)</p>

# MODULE 8-

## TMJ and Malocclusion

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"><li>• The importance of TMJ and TMD in Orthodontics</li><li>• Anatomy and physiology of the TMJ</li><li>• Diagnosing the presence of TMD and its progress if present</li><li>• The aetiology of TMD</li><li>• The management of TMD</li></ul>	<p>-Describe normal TMJ function and examine TMJ in various malocclusion</p> <p>-Understands the position of condyle in different malocclusion</p> <p>-Diagnose and treatment plan with respect to TMD</p> <p>- Evaluate the TMD in orthodontic patients in pre and post treatment.</p>	<p>-Attend trainee seminars / tutorials</p> <p>- Independent study</p> <p>- Web based e-learning Sources</p> <p>-Seminars, case presentations and journal clubs.</p> <p>- CMEs, Conventions and Conferences.</p> <p>- Suitable course and meetings</p>	<p>- Workplace based assessment</p> <p>-Written exam</p> <p>-OSCE</p> <p>- MCQ</p>

# MODULE: 9

## Clinical Photography in Orthodontics

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"><li>• Principles and practise of clinical Photography in a Standerized manner</li><li>• Describe the underlying principles of clinical photography and the ways in which the principles can be applied to the taken photographs of standard environment</li></ul>	<p>-Apply knowledge of clinical photography and correlate with lat. Cephalometry to understands the malocclusion</p> <p>-Compare the pre and post treatment photographs</p>	<p>- Attend lectures / seminars within the department</p> <p>-Independent study</p> <p>-Seminars, case presentations and journal clubs.</p> <p>-Suitable meetings</p> <p>-CMEs, Conventions and Conferences.</p> <p>-Skill labs</p> <p>-Web based e-learning sources</p>	<p>- Written examination</p> <p>- Objective Structured Clinical Examination</p> <p>-Workplace based assessment</p> <p>-Multiple choice question (MCQ)</p>

## **MODULE 10-**

### **Social and Psychological Needs of Children Suffering from Malocclusion & Dentofacial Deformities**

<b>Expected outcome</b>	<b>Intended learning objectives</b>	<b>Teaching learning Methods</b>	<b>Assessment tools</b>
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"><li>• The psychological basis of patients suffering from malocclusion and deformities and assess the orthodontic treatment planning.</li><li>• To understand normal and abnormal psychological development including deformities from childhood to adulthood</li></ul>	<p>-Apply knowledge of psychological development to the assessment of psychological improvement after orthodontic treatment of patients.</p>	<ul style="list-style-type: none"><li>- Attend seminars / tutorials</li><li>- Independent study</li><li>- Web based e learning Sources</li><li>- Seminars and journal clubs.</li><li>- Suitable courses and meetings</li><li>- CMEs, Conventions and Conferences.</li></ul>	<ul style="list-style-type: none"><li>- Workplace based assessment</li><li>-Written exam</li><li>- OSCE</li><li>-MCQ</li></ul>

# MODULE 11-

## Sterilization and Dental care during Orthodontic Treatment

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information about:</p> <ul style="list-style-type: none"><li>• What is sterilization and disinfection</li><li>• Discuss different Orthodontic sterilization techniques</li><li>• Discuss the guideline for effective and safe infection control and disinfection methods</li><li>• Different testing for orthodontic sterilizers.</li></ul>	<p>-Apply appropriate sterilization and disinfection method in the clinics.</p> <p>-Apply the post sterilization ( drying, cooling, storage and distribution ) procedures clinically.</p>	<p>- Attend seminars / tutorials</p> <p>-Independent study</p> <p>-Web based elearning Sources</p> <p>-Case presentation, seminars and journal clubs.</p> <p>-Suitable course and meetings</p> <p>-Skill labs</p> <p>-CMEs, Conventions and Conferences.</p>	<p>-Workplace based assessment</p> <p>-Written exam</p> <p>- OSCE</p> <p>- MCQ</p>

# MODULE 12-

## Extraction in Orthodontics

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"><li>• To make the diagnosis of the patient</li><li>• To assess the tooth extraction according to malocclusion</li><li>• To plan the patient treatment according to need</li><li>• To know the effect of individual tooth extraction</li></ul>	<p>-Apply knowledge of tooth extraction for the treatment in different malocclusion.</p> <p>-Understands the effect of extraction on the dentition</p>	<p>- Attend seminars / tutorials</p> <p>- Independent study</p> <p>- Web based e-learning</p> <p>Sources</p> <p>-Case presentation, seminars and journal clubs.</p> <p>-Suitable courses and meeting</p> <p>- CMEs, Conventions and Conferences.</p>	<p>-Workplace based assessment</p> <p>- Written exam</p> <p>- OSCE</p> <p>- MCQ</p>

# MODULE 13-

## Non-Extraction Treatment

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"><li>• The principle and limitations of Non-Extraction treatment.</li><li>• Fabrication of design of different appliance for non-extraction treatment.</li><li>• Indications and contraindications for the use of Non-Extraction.</li><li>• Discuss the case selection of nonextraction</li><li>• Discuss the different method of Non-Extraction approach</li></ul>	<p>-Application of non-extraction treatment approach according to malocclusion</p> <p>- Fabrication of different appliance appliances for specific malocclusions</p>	<p>-Attend seminars / tutorials</p> <p>-Independent study</p> <p>- Web based e-learning</p> <p>Sources</p> <p>- Case presentation, seminars and journal clubs.</p> <p>-Suitable course and meetings</p> <p>-Skill labs</p> <p>-CMEs, Conventions and Conferences.</p>	<p>- Workplace based assessment</p> <p>-Written exam</p> <p>- OSCE</p> <p>- MCQ</p>

# MODULE 14-

## Early Treatment, Dentofacial Orthopedics

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"> <li>• The principle and limitations of Early treatment</li> <li>• Rationale of early orthodontic treatment</li> <li>• Early treatment in different malocclusion</li> <li>• When should early treatment for crossbite begin?</li> <li>• Indication and contraindication of early treatment</li>   <li>• Principle and application of orthopaedic appliance</li> <li>• Ideal time for the application of orthopaedic forces</li> <li>• Use of orthopaedic appliance</li> <li>• To understand the Force</li> </ul>	<p>-Advantages of Early orthodontic treatment according to malocclusion</p> <p>-Application of different appliance in different malocclusion at the early stage</p> <p>-How to design, Construct and management of orthopaedic appliance</p> <p>-How to deliver extraoral Forces</p> <p>-Direction of force of different types of orthopaedic appliance</p>	<p>-Attend seminars / tutorials</p> <p>- Independent study</p> <p>- Web based e-learning</p> <p>Sources</p> <p>-Clinics, case presentation, seminars and journal clubs.</p> <p>- Suitable course and suitable meetings</p> <p>-Skill labs</p> <p>-CMEs, Conventions and Conferences.</p>	<p>- Workplace based assessment</p> <p>-Written exam</p> <p>-OSCE</p> <p>- MCQ</p>



<p>levels and Direction.</p> <ul style="list-style-type: none"><li>• Types of Orthopaedic appliances</li><li>• Advantages and disadvantages of orthopaedic appliances</li></ul>			
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## MODULE 15-

### Principles of Functional Appliances Therapy with Emphasis on Bite Recording and Functional appliances (Activator, bionator, frankel and twin block)

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"> <li>• The principle and limitations of Functional appliances.</li> <li>• Fabrication of design of different appliance.</li> <li>• Types of functional appliance.</li> <li>• Indications and contraindications for the use of functional appliances.</li> </ul> <p>-The scope and limitations of Fixed functional appliances</p> <ul style="list-style-type: none"> <li>• Describe the indications and contraindications for the use of fixed functional appliances</li> <li>• Describe the design and construction of various types of fixed functional appliance</li> <li>• Explain the relative merits</li> </ul>	<p>-Application of functional appliances according to malocclusion</p> <p>- Fabrication of growth modification appliances for specific malocclusions</p> <p>-Apply knowledge of the integration of fixed functional Appliances</p> <p>- Design growth modification Appliances according to specific malocclusions</p>	<p>-Attend seminars / tutorials</p> <p>-Independent study</p> <p>-Web based elearning</p> <p>Sources</p> <p>-Clinics, case presentation, seminars and journal clubs.</p> <p>-Suitable courseand meetings</p> <p>-CMEs, Conventions and Conferences.</p>	<p>- Workplace based assessment</p> <p>- Written exam</p> <p>-DOPS</p> <p>-OSCE</p> <p>-MCQ</p>

of different fixed functional appliance designs			
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# MODULE 16-

## Smile in Orthodontics

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"><li>• Anatomy of smile, classification of smile, different components of smile at rest and dynamic position.</li><li>• Smile changes with age</li><li>• Difference of smile in different malocclusion.</li><li>• To understand smile in normal and malocclusion subjects.</li></ul>	<p>-Clinical significance of smile</p> <p>-Assessment of smile in different malocclusion</p> <p>-Assess the smile in different age group and sex.</p>	<p>-Attend seminars / tutorials</p> <p>- Independent study</p> <p>- Web based elearning Sources</p> <p>-Clinics, case presentation, seminars and journal clubs.</p> <p>-Suitable course and meetings</p> <p>-Skill labs</p> <p>-CMEs, Conventions and Conferences.</p>	<p>- Workplace based assessment</p> <p>-Written exam</p> <p>- OSCE</p> <p>- MCQ</p>

# MODULE 17-

## Space closure in Orthodontics

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"><li>• The principles of space closure mechanics.</li><li>• Types of space closure mechanics .</li></ul> <p>- Sliding mechanics - Loop mechanics</p> <ul style="list-style-type: none"><li>• Different types of loops and biomechanics of loops.</li></ul>	<p>-Application of Space closure mechanics according to malocclusion</p> <p>-Indication and contraindication of different types of space closure mechanics.</p>	<p>-Attend seminars / tutorials</p> <p>-Independent study</p> <p>-Web based e-learning Sources</p> <p>-Clinics, case presentation, seminars and journal clubs.</p> <p>-Suitable course and meetings</p> <p>-Skill labs</p> <p>- CMEs, Conventions and Conferences.</p>	<p>-Workplace based assessment</p> <p>-Written exam</p> <p>- OSCE</p> <p>- MCQ</p>

# MODULE 18-

## Impaction and Transposition in Orthodontics

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"> <li>Etiology , frequency , classification and diagnosis of Impactions</li> <li>Different surgical techniques</li> </ul> <p>-Treatment Strategies</p> <p>Impactions Of Incisors Impaction Of Canines Impactions Of Premolars Impactions Of Molars</p> <ul style="list-style-type: none"> <li>Etiology , frequency , classification and diagnosis of Transposition</li> </ul> <p>-Treatment Strategies of different transposition</p>	<p>-Apply the direction of force to erupt the impaction teeth.</p> <p>-Apply the surgical procedure according to degree of impaction and traction force applied according to need.</p>	<p>- Attend seminars / tutorials</p> <p>-Independent study</p> <p>-Web based e-learning Sources</p> <p>- Clinics, case presentation, seminars and journal clubs.</p> <p>-Suitable course and meetings</p> <p>-Skill labs</p> <p>. CMEs, Conventions and Conferences.</p>	<p>-Workplace based assessment</p> <p>-Written exam</p> <p>- OSCE</p> <p>-MCQ</p>

## MODULE 19-

### Fixed mechanotherapy in Orthodontics ( Standard edgewise, Bio- progressive therapy, Roth and MBT)

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"> <li>• Advantages, disadvantages and limitations of fixed appliances</li> <li>• Indications and contraindications</li> <li>• How to place bond and cementation of fixed appliances</li> <li>• Anchorage planning</li> <li>• Use of ligatures and elastics and other auxiliaries</li> <li>• Discuss the various types of fixed appliances</li> <li>• Discuss the different types of preadjusted edgewise appliances and prescriptions</li> </ul>	<p>-How to select, which appliance systems is appropriate to the specific type of malocclusions</p> <p>-Understands the literature with relation to bracket system choice</p>	<ul style="list-style-type: none"> <li>· Attend seminars / tutorials</li> <li>· Independent study</li> <li>· Web based e-learning Sources</li> <li>· Clinics, case presentation, seminars and journal clubs.</li> <li>· Suitable course and meetings</li> <li>· Skill labs</li> <li>· CMEs, Conventions and Conferences.</li> </ul>	<ul style="list-style-type: none"> <li>· Workplace based assessment</li> <li>· Written exam</li> <li>· OSCE</li> <li>· MCQ</li> </ul>

## **MODULE 20-**

### **Biomechanics in Orthodontics**

<b>Expected outcome</b>	<b>Intended learning objectives</b>	<b>Teaching learning Methods</b>	<b>Assessment tools</b>
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"><li>• Basics of biomechanics and their effects in different types of tooth movement</li><li>• Action and reaction of applied force system as the tooth movements achieved</li><li>• Describe the way in which archwires achieve their tooth movements</li><li>• Variations of biomechanics</li></ul>	<p>-Apply appropriate biomechanics according to the clinical situation</p> <p>- Analyse and accounts for desired and undesired tooth movements according to applied mechanics</p>	<p>- Attend seminars / tutorials</p> <p>- Independent study</p> <p>-Web based e-learning Sources</p> <p>- Clinics, case presentation, seminars and journal clubs.</p> <p>- Suitable course and meetings</p> <p>-Skill labs</p> <p>-Typhodont</p> <p>. CMEs, Conventions and Conferences.</p>	<p>-Workplace based assessment</p> <p>-Written exam</p> <p>-DOPS</p> <p>-OSCE</p> <p>-MCQ</p>



## MODULE 21-

### Cleft lip, palate and other craniofacial anomalies in Orthodontics

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"><li>• Recognition the type of CLP and different craniofacial anomalies</li><li>• Diagnostic procedures used to diagnose the CLP and other craniofacial anomalies</li><li>• The stages in the management of cleft lip and/or palate patients</li><li>• Treatment options for the different craniofacial disorder</li><li>• Explain the timing of orthodontic care in cleft lip and/or palate patients</li></ul>	<p>-Choose the area of defect and the cases which cannot be treated by orthodontics alone</p> <p>-Council and communicate to patients for the cleft care</p>	<p>- Attend seminars / tutorials</p> <p>- Independent study</p> <p>- Web based e-learning Sources</p> <p>-Clinics, case presentation, seminars and journal clubs.</p> <p>- Suitable courses and meetings</p> <p>-Skill labs</p> <p>-CMEs, Conventions and Conferences.</p>	<p>- Workplace based assessment</p> <p>- Written exam</p> <p>-DOPS</p> <p>-OSCE</p> <p>- MCQ</p>

## MODULE 22-

### Treatment of (Class II div 1, Class II div 2, Class III, Deep bite and Open bite)

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"><li>• Identification of patient malocclusion</li><li>• Identification of treatment aims, type of treatment necessary to treat the malocclusion</li><li>• Explain to patients relevant to the delivery of treatment</li><li>• Discuss the way by which the treatment we can achieve the objective</li></ul>	<p>-Evaluate information required to treat the malocclusion</p> <p>-Analyse all possible treatment options including the provision of no treatment</p>	<p>-Attend seminars / tutorials</p> <p>- Independent study</p> <p>- Web based e-learning Sources</p> <p>- Clinics, case presentation, seminars and journal clubs.</p> <p>- Suitable course and meetings</p> <p>-Skill labs</p> <p>- CMEs, Conventions and Conferences.</p>	<p>- Workplace based .ssessment</p> <p>-Written exam</p> <p>-DOPS</p> <p>- OSCE</p> <p>-MCQ</p>

## **MODULE 23-**

### **Finishing & Detailing in Orthodontics**

<b>Expected outcome</b>	<b>Intended learning objectives</b>	<b>Teaching learning Methods</b>	<b>Assessment tools</b>
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"><li>• Discuss the steps in finishing and detailing</li><li>• Ideal requirement of finishing and detailing</li><li>• Describe how to achieve finishing and detailing in different bracket system</li><li>• Guidelines of finishing and detailing</li></ul>	<p>-Evaluate information required for finishing and detailing</p> <p>-Evaluate the finishing and detailing in every treated case</p>	<p>- Attend seminars / tutorials</p> <p>- Independent study</p> <p>-Web based e-learning Sources</p> <p>- Clinics, case presentation, seminars and journal clubs.</p> <p>-Suitable course and meetings</p> <p>-Skill labs</p> <p>- Attendance at CMEs, Conventions and Conferences.</p>	<p>-Workplace based assessment</p> <p>-Written exam</p> <p>-OSCE</p> <p>- MCQ</p>

## **MODULE 24-**

### **Digital imaging in Orthodontics**

<b>Expected outcome</b>	<b>Intended learning objectives</b>	<b>Teaching learning Methods</b>	<b>Assessment tools</b>
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"><li>• Principles and practice of digital imaging and other imaging technology</li><li>• Explain the advantages and disadvantages of digital imaging</li><li>• Explain the different type of software and how to apply</li><li>• Describe radiation protection guidelines</li></ul>	<p>-Apply knowledge of digital imaging techniques to the diagnosis and treatment planning for orthodontic patients</p>	<p>-Attend seminars / tutorials</p> <p>-Independent study</p> <p>-Web based e-learning Sources</p> <p>-Clinics, case presentation, seminars and journal clubs.</p> <p>-Suitable course and meetings</p> <p>-Skill labs</p> <p>-CMEs, Conventions and Conferences.</p>	<p>- Workplace based assessment</p> <p>-Written exam</p> <p>-DOPS</p> <p>-OSCE</p> <p>- MCQ</p>

# MODULE 25-

## Surgical Orthodontics and Adult Orthodontics

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"> <li>• How to expose and manage the impacted teeth</li> <li>• Indication and contraindication of surgical procedures</li> <li>• Management of severe skeletal dysplasias</li> <li>• Discuss the different treatment options according to severity of problem</li> <li>• Combination of surgery and orthodontics</li> <li>• Various surgical methods to achieve ideal occlusion</li> <li>• Periodontal status of patient, considerations temporo-mandibular joint and age related changes</li> </ul>	<p>-Demonstrate the ability to make decisions for the surgical procedures</p> <p>- Communicate and discuss the patients/ parents about the surgical management</p> <p>- Apply appropriate treatment options</p> <p>-Communicate the adult patients and understands is expectation related to treatment</p> <p>-Motivate and educate the adults patients for their treatment</p>	<p>-Attend seminars / tutorials</p> <p>-Independent study</p> <p>- Web based e-learning Sources</p> <p>- Clinics, case presentation, seminars and journal clubs.</p> <p>- Suitable course and meetings</p> <p>-Skill labs</p> <p>- CMEs, Conventions and Conferences.</p>	<p>- Workplace based assessment</p> <p>- Written exam</p> <p>-DOPS</p> <p>- OSCE</p> <p>- MCQ</p>

<ul style="list-style-type: none"><li>• Biomechanics and amount and direction of force</li><li>• Identify Skeletal, dental and soft tissue health in adult patients</li><li>• Discuss the various appliance therapy: its goals, principles and procedures</li></ul>			
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## **MODULE 26-**

### **Retention & Relapse**

<b>Expected outcome</b>	<b>Intended learning objectives</b>	<b>Teaching learning Methods</b>	<b>Assessment tools</b>
<p>-This module will provide Information and experience in:</p> <ul style="list-style-type: none"><li>• Understands the School of Thoughts</li><li>• Discuss the biologic Basis for Orthodontic Relapse</li><li>• Discuss the Principles of Retention</li><li>• Factors affecting retention</li><li>• Various conditions requiring retention</li><li>• Various Removable and Fixed Retainers</li></ul>	<p>-Place the retainer according to malocclusion and retention required</p> <p>-Place appropriate retainer according to malocclusion</p>	<p>- Attend seminars / tutorials</p> <p>- Independent study</p> <p>- Web based e-learning Sources</p> <p>- Clinics, case presentation, seminars and journal clubs.</p> <p>- Suitable course and meetings</p> <p>-Skill labs</p> <p>- CMEs, Conventions and Conferences.</p>	<p>-Workplace based assessment</p> <p>-Written exam</p> <p>- OSCE</p> <p>- MCQ</p>

## MODULE 27-

### Recent knowledge of Orthodontics (Lingual orthodontics, implants, magnets and self ligating brackets etc) and Newer materials in Orthodontics

Expected outcome	Intended learning objectives	Teaching learning Methods	Assessment tools
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"> <li>• Recent advancement in orthodontics.</li> <li>• A Historical background of implants, lingual appliance, magnets and self ligating brackets.</li> <li>• Classification</li> <li>• Basic terminologies</li> <li>• Principles</li> <li>• Application of appliance</li> <li>• Clinical studies</li> <li>• Different types of materials available and their properties</li> <li>• Interaction of orthodontic brackets and wires and the tooth movements achieved</li> <li>• Discuss the different types</li> </ul>	<p>-Advantages and disadvantages</p> <p>-Biological consideration</p> <p>-Apply appropriate materials for the clinical situation</p> <p>-Communicate to the patients/ parents the advantages/ disadvantages and use/limitations of different material.</p> <p>-Use appropriate material according to the malocclusion of the tooth</p> <p>- Evaluate and analyse the effect of material in the oral cavity</p>	<p>-Attend seminars / tutorials</p> <p>- Independent study</p> <p>-Web based e-learning Sources</p> <p>- Clinics, case presentation, seminars and journal clubs.</p> <p>- Suitable course and meetings</p> <p>-Skill labs</p> <p>- CMEs, Conventions and Conferences.</p>	<p>- Workplace based assessment</p> <p>- Written exam</p> <p>- OSCE</p> <p>- MCQ</p>



of materials and advance in newer materials introduced in orthodontics			
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## **MODULE 28-**

### **Evidence Based Orthodontics**

<b>Expected outcome</b>	<b>Intended learning objectives</b>	<b>Teaching learning Methods</b>	<b>Assessment tools</b>
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"><li>• Era of Evidence</li><li>• Definition and Importance of Evidence.</li><li>• A Historical background of Evidence based Orthodontics.</li><li>• Classification of Evidence</li><li>• Basic need and Principle of Evidence</li><li>• Application of Evidence based Orthodontics</li><li>• Clinical studies on Evidence based Orthodontics</li></ul>	<p>-Advantages and disadvantages of Evidence</p> <p>-How to do Evidence and effect of Evidence</p>	<p>-Attend seminars / tutorials</p> <p>- Independent study</p> <p>-Web based e-learning Sources</p> <p>- Suitable course and meetings</p> <p>-Skill labs</p> <p>- CMEs, Conventions and Conferences.</p>	<p>- Workplace based assessment</p> <p>- Written exam</p> <p>- OSCE</p> <p>- MCQ</p>

## **MODULE 29-**

### **Accelerated Orthodontic Tooth Movement (AOTM)**

<b>Expected outcome</b>	<b>Intended learning objectives</b>	<b>Teaching learning Methods</b>	<b>Assessment tools</b>
<p>-This module will provide information and experience in:</p> <ul style="list-style-type: none"><li>• Definition and Importance of Accelerated tooth movement.</li><li>• A History of Accelerated tooth movement.</li><li>• Physiology of AOTM</li><li>• Basic need and Principle of AOTM</li><li>• Application of AOTM according to need</li><li>• Classification of AOTM</li><li>• Recent methods of AOTM</li><li>• Clinical studies ON AOTM</li></ul>	<p>-Advantages and disadvantages of AOTM</p> <p>-How the AOTM works</p> <p>-</p>	<p>-Attend seminars / tutorials</p> <p>- Independent study</p> <p>-Web based e-learning Sources</p> <p>- Suitable course and meetings</p> <p>-Skill labs</p> <p>- CMEs, Conventions and Conferences.</p>	<p>- Workplace based assessment</p> <p>- Written exam</p> <p>- OSCE</p> <p>- MCQ</p>

## **MODULE 30-**

### **Successful Management of Orthodontic Practice**

<b>Expected outcome</b>	<b>Intended learning objectives</b>	<b>Teaching learning Methods</b>	<b>Assessment tools</b>
-This module will provide information and experience in: <ul style="list-style-type: none"><li>•</li></ul>	-	-Attend seminars / tutorials  - Independent study  -Web based e-learning Sources  - Suitable course and meetings  -Skill labs  - CMEs, Conventions and Conferences.	- Workplace based assessment  - Written exam  - OSCE  - MCQ

### **Examination Pattern:**

- A. Theory: Part-I: Basic Sciences Paper - 100 Marks
- B. 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, 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)

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

B. Practical / Clinical Examination : 200 Marks

Exercise No: 1 50 Marks

Functional Case :

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

Fabrication and delivery of the appliance the next day.

Exercise No: 2 : 50 Marks

1. III stage with auxiliary springs/Wire bending of any stage of fixed orthodontics (OR)

2. Bonding of SWA brackets and construction of suitable arch wire.

Exercise No. 3 75 Marks

Display of records of the treated cases

(Minimum of 5 cases)

Exercise No: 4 25 Mark

Long case discussions

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 hr 30 min
3	Display of case records (a minimum of 5 cases to be presented along with all the patients and records)	75	1 hour
4	Long cases	25	2 hours

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

C. Viva Voce : 100 Marks

i. Viva-Voce examination:

80 marks

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

ii. Pedagogy Exercise:

20 marks

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