PEDIATRIC AND PREVENTIVE DENTISTRY

OBJECTIVES:

At the end of 3 years of training the candidate should be able to

1. Create not only a good oral health in the child but also a good citizen tomorrow.
2. Instill a positive attitude and behavior in children
3. Understand the principles of prevention and preventive dentistry right from birth to adolescence
4. Guide and counsel the parents in regards to various treatment modalities including different facets of preventive dentistry
5. Prevent and intercept developing malocclusion

Skills:

1. Obtain proper clinical history, methodological examination of the child patient, perform essential diagnostic procedures and interpret them. and arrive at a reasonable diagnosis and treat appropriately
2. Be competent to treat dental diseases which are occurring in child patient.
3. Manage to repair and restore the lost / tooth structure to maintain harmony between both hard and soft tissues of the oral cavity.
4. Manage the disabled children effectively and efficiently, tailored to the needs of individual requirement and conditions.
5. To acquire skills in managing efficiently life threatening conditions with emphasis on basic life support measures.

Attitudes:

1. Develop an attitude to adopt ethical principles in all aspects of Pedodontic 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 Pedodontic management developed from time to time, based on scientific research, which are in the best interest of the child patient.
6. Respect child patient's rights and privileges, including child patients right to information and right to seek a second opinion.
7. Develop an attitude to seek opinion from allied medical and dental specialities, as and when required

COURSE CONTENTS:

A) Applied Basic Sciences:

Applied Anatomy of Head and Neck:

- Anatomy of the scalp, temple and face
- Anatomy of the triangles of neck and deep structures of the neck
- Cranial and facial bones and its surrounding soft tissues with its applied aspects
- Muscles of head and neck
- Arterial supply, venous drainage and lymphatics of head and neck
- Congenital abnormalities of the head and neck
- Anatomy of the cranial nerves

- Anatomy of the tongue and its applied aspects
- Anatomy and its applied aspects of salivary glands, pharynx, thyroid and parathyroid gland, larynx, trachea, esophagus
- Autonomous nervous system of head and neck
- Functional anatomy of mastication, deglutition, speech, respiration and circulation
- TMJ: anatomy and function

Applied Physiology:

Introduction, Mastication, deglutition, digestion and assimilation, Homeostasis, fluid and electrolyte balance. Blood composition, volume, function, blood groups and hemorrhage, Blood transfusion, circulation, Heart, Pulse, Blood pressure, Normal ECG,capillary and lymphatic circulation, shock, respiration, control, anoxia, hypoxia, asphyxia, artificial respiration. Endocrine glands in particular reference to pituitary, parathyroid and thyroid glands and sex hormones. Role of calcium and Vit D in growth and development of teeth, bone and jaws.Role of Vit.A, C and B complex in oral mucosal and periodontal health.Physiology and function of the masticatory system. Speech mechanism, swallowing and deglutition mechanism, salivary glands and Saliva

Applied Pathology:

Inflammation and chemical mediators, Thrombosis, Embolism, Necrosis, Repair, Degeneration , Shock, Hemorrhage , Blood dyscrasias, Pathogenesis of Dental Caries, Periodontal diseases, tumors, oral mucosal lesions etc. in children

Applied Microbiology:

Microbiology & Immunology as related to Oral Diseases in Children: Basic concepts, immune system in human body, Auto Immune diseases and Immunology of Dental caries.

Applied Nutrition & Dietics:

- General principles, balanced diet, effect of dietary deficiencies and starvation, protein energy, malnutrition, Kwashiorkor, Marasmus.
- Fluid and Electrolytic balance in maintaining haemostasis
- Diet, digestion, absorption, transportation and utilization

Genetics:

- Introduction to genetics
- Cell structure, DNA, RNA, protein synthesis, cell division
- Modes of inheritance
- Chromosomal anomalies of oral tissues & single gene disorders

Growth & Development:

Prenatal and Postnatal development of cranium, face, jaws, teeth and supporting structures.Chronology of dental development and development of occlusion. Dimensional changes in dental arches. Cephalometric evaluation of growth.

B) Pediatric Dentistry:

- Child Psychology:

  Development & Classification of behavior, personality, intelligence in children, theories of child psychology, stages of psychological child development, fear, anxiety, apprehension & its management.

- Behavior Management: Non- pharmacological & Pharmacological methods.

- Child Abuse & Dental Neglect:

- Conscious Sedation:

- Deep Sedation & General Anesthesia in Pediatric Dentistry: (Including Other Drugs, Synergic & Antagonistic Actions of Various Drugs Used in Children

Preventive Pedodontics:

Concepts, chair side preventive measures for dental diseases, high-risk caries including rampant & extensive caries – Recognition, Features & Preventive Management, Pit and Fissures Sealants, Oral Hygiene measures, Correlation of brushing with dental caries and periodontal diseases. Diet & Nutrition as related to dental caries. Diet Counseling

Dental Plaque:

Definition, Initiation, Pathogenesis, Biochemistry, and Morphology & Metabolism.

Gingival & Periodontal diseases in Children:

- Normal Gingiva & Periodontium in children.
- Gingival & Periodontal diseases – Etiology, Pathogenesis, Prevention & Management

Pediatric Operative Dentistry:

- Principle of Operative Dentistry along with modifications of materials/past, current & latest including tooth colored materials.
- Modifications required for cavity preparation in primary and young permanent teeth.
- Various Isolation Techniques
- Restorations of decayed primary, young permanent and permanent teeth in children using various restorative material like Glass Ionomer, Composites, Silver, Amalgam & latest material (gallium)
- Stainless steel, Polycarbonate & Resin Crowns / Veneers & fibre post systems.

Pediatric Endodontics:

- Primary Dentition: - Diagnosis of pulpal diseases and their management – Pulp capping, Pulpotomy, Pulpectomy (Materials & Methods), Controversies & recent concepts.
- Young permanent teeth and permanent teeth, Pulp capping, Pulpotomy, Apexogenesis, Apexification, Concepts, Techniques and Materials used for different procedures.
- Recent advances in Pediatric diagnosis and Endodontics.
  Prosthetic consideration in Pediatric Dentistry.

Traumatic Injuries in Children:

- Classifications & Importance.
- Sequelae & reaction of teeth to trauma.
- Management of Traumatized teeth with latest concepts.
- Management of jaw fractures in children.

Interceptive Orthodontics:

- Concepts of occlusion and esthetics: Structure and function of all anatomic components of occlusion, mechanics of articulations, recording of masticatory function, diagnosis of Occlusal dysfunction, relationship of TMJ anatomy and pathology and related neuromuscular physiology.

- A comprehensive review of the local and systemic factors in the causation of malocclusion.
- Recognition and management of normal and abnormal developmental occlusions in primary, mixed and permanent dentitions in children (Occlusal Guidance).
- Biology of tooth movement: A comprehensive review of the principles of teeth movement. Review of contemporary literature. Histopathology of bone and Periodontal ligament, Molecular and ultra cellular consideration in tooth movement.
- Myofunctional appliances: Basic principles, contemporary appliances: Design & Fabrication
- Removable appliances: Basic principles, contemporary appliances: Design & Fabrication
- Case selection & diagnosis in interceptive Orthodontics (Cephalometrics, Image processing, Tracing, Radiation hygiene, Video imaging & advance Cephalometric techniques).
- Space Management: Etiology, Diagnosis of space problems, analysis, Biomechanics, Planned extraction in interceptive orthodontics.

Oral Habits in Children:

- Definition, Etiology & Classification
- Clinical features of digit sucking, tongue thrusting, mouth breathing & various other secondary habits.
- Management of oral habits in children

Dental care of Children with special needs:

Definition, Etiology, Classification, Behavioral, Clinical features & Management of children with:

- Physically handicapped conditions
- Mentally compromising conditions
- Medically compromising conditions
- Genetic disorders

Oral manifestations of Systemic Conditions in Children & their Management
Management of Minor Oral Surgical Procedures in Children
Dental Radiology as related to Pediatric Dentistry

Cariology:

- Historical background
- Definition, Aeitology & Pathogenesis
- Caries pattern in primary, young permanent and permanent teeth in children.
- Rampant caries, early childhood caries and extensive caries. Definition, aeitology, Pathogenesis, Clinical features, Complications & Management.
- Role of diet and nutrition in Dental Caries
- Dietary modifications & Diet counseling.
- Subjective & objective methods of Caries detection with emphasis on Caries Activity tests, Caries prediction, Caries susceptibility & their clinical Applications

Pediatric Oral Medicine & Clinical Pathology: Recognition & Management of developmental dental anomalies, teething disorders, stomatological conditions, mucosal lesions, viral infections etc.

Congenital Abnormalities in Children: Definition, Classification, Clinical features & Management.

Dental Emergencies in Children and their Management.

Dental Materials used in Pediatric Dentistry.

C) Preventive Dentistry:

- Definition
- Principles & Scope
- Types of prevention
- Different preventive measures used in Pediatric Dentistry including fissure sealants and caries vaccine.

Dental Health Education & School Dental Health Programmes:

Dental health concepts, Effects of civilization and environment, Dental Health delivery system, Public Health measures related to children along with principles of Pediatric Preventive Dentistry

Fluorides:

- Historical background
- Systemic & Topical fluorides
- Mechanism of action
- Toxicity & Management.
- Defluoridation techniques.

Medico legal aspects in Pediatric Dentistry with emphasis on informed concert.

Counseling in Pediatric Dentistry

Case History Recording: Outline of principles of examination, diagnosis & treatment planning.

Epidemiology: Concepts, Methods of recording & evaluation of various oral diseases. Various national & global trends of epidemiology of oral diseases.

Comprehensive Infant Oral Health Care.

Principles of Bio-Statistics& Research Methodology & Understanding of Computers and Photography

Comprehensive cleft care management with emphasis on counseling, feeding, nasoalveolar bone remodeling, speech rehabilitation.

Setting up of Pediatric Dentistry Clinic.

Emerging concepts in Pediatric Dentistry of scope of lasers / minimum invasive procedures in Pediatric Dentistry.

Preclinical Work

(Duration – first 6 Months of First Year MDS)

(One on Each Exercise)

1. Carving of all deciduous teeth
2. Basic wire bending exercises(Clasps, Bows, Retractors and Springs, etc., on patient models)
3. Basics for Spot welding exercises
4. Fabrication of
   a. Maxillary bite plate / Hawley's'
   b. Maxillary expansion screw appliance
   c. Canine retractor appliance

d. All habit breaking appliances
   - Removable type
   - Fixed type
   - Partially fixed and removable

e. Myofunctional appliances – Twin block, Activator, Lip bumper, Oral Screen

f. Making of inclined plane appliance

g. Feeding appliances

5. Basic soldering exercises – making of a lamppost of stainless steel wire pieces of different gauges soldered on either side of heavy gauge main post.
6. Fabrication of space maintainers
   a. Removable type-
      - Unilateral Non – Functional space maintainer
      - Bilateral Non-Functional space maintainer
   b. Space Regainers –
      - Gerber or Opencoil space regainer
   c. Fixed Space maintainers
      - Band & loop space maintainer
      - Transpalatal arch space maintainer
      - Nance Palatal holding arch
      - Distal shoe appliance
7. Basics for spot welding exercise
8. Collection of extracted deciduous and permanent teeth
   a. Sectioning of the teeth at various levels and planes
   b. Drawing of section and shapes of pulp
   c. Phantom Head Exercises : Performing ideal cavity preparation for various restorative materials for both Deciduous and permanent teeth
   d. Performing pulpotomy, root canal treatment and Apexification procedure
      i) Tooth preparation and fabrication of various temporary and permanent restorations on fractured anterior teeth.
      ii) Preparation of teeth for various types of crowns
      iii) Laminates/veneers
      iv) Bonding & banding exercise
9. Performing of behavioral rating and IQ tests for children.
10. Computation of: -
    a. Caries index and performing various caries activity tests.
    b. Oral Hygiene Index
    c. c. Fluorosis Index
11. Surgical Exercises :
    a. Fabrication of splints
    b. Type of Wiring
    c. Suturing
12. a. Taking of periapical, occlusal, bitewing radiographs of children
    b. Developing and processing of films, thus obtained
    c. Tracing of soft tissue dental and skeletal landmarks as observed on Cephalometric radiographs and drawing of various planes and angles, further interpretation of Cephalometric radiographs.
    d. Mixed dentition cast analysis
13. Library assignment
14. Synopsis

Clinical work Requirements from 7 to 36 months

The following is the minimum requirement to be completed before the candidate can be considered eligible to appear in the final M.D.S Examinations:

S.	Clinical Work	Total	7 To 12	13 To 24	25 To 36

			Months	Months	Months
1.	Behavior Management of different age groups children with complete records.	17	2	10	5
2.	Detailed Case evaluation with complete records, treatment planning and presentation of cases with chair side and discussion	17	2	10	5
3.	Step-by-step chair side preventive dentistry scheduled for high risk children with gingival and periodontal diseases &Dental Caries	11	1	5	5
4.	Practical application of Preventive dentistry concepts in a class of 35-50 children& Dental Health Education & Motivation.	7	1	4	2
5.	Pediatric Operative Dentistry with application of recent concepts. (a). Management of Dental Caries				
	(I) Class I	50	30	10	10
	(II) Class II	100	40	50	10
	(III) Other Restorations	100	20	50	30
	(b). Management of traumatized anterior teeth	15	04	06	05
	(c) Aesthetic Restorations	25	05	10	10
	(d). Pediatric Endodontic Procedures Deciduous teeth Pulpotomy / Pulpectomy Permanent Molars Permanent Incisor Apexification & Apexogenesis	 150 20 15 20	 30 3 2 02	 50 7 3 08	 70 10 10 10
6.	Stainless Steel Crowns	50	10	20	20
7.	Other Crowns	05	01	02	02
8.	Fixed : Space Maintainers Habit breaking appliances	30	08	12	10
9.	Removable : Space Maintainers Habit breaking appliances	20	05	07	08
10.	Functional Appliances	05	01	02	02
11.	Preventive measures like fluoride applications & Pit & Fissure Sealants applications with complete follow-up and diet counseling	20	08	08	04
12.	Special Assignments (i) School Dental Health Programmes	03	01	01	01
	(ii) Camps etc.,	02	01	01	-
13	Library usage				
14	Laboratory usage				
15	Continuing Dental Health Programmes				

(The figures given against Sl. No. 4 to 12 are the minimum number of recommended procedures to be performed)

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. 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 Basic Sciences:Applied Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics Growth & Development and Dental plaque, Genetics.

Part-II:

Paper-I :**Clinical Paedodontics**

1. Conscious sedation, Deep Sedation & General Anesthesia in Pediatric Dentistry
2. Gingival & Periodontal Diseases in Children
3. Pediatric Operative Dentistry
4. Pediatric Endodontics
5. Traumatic Injuries in Children
6. Interceptive Orthodontics
7. Oral Habits in children
8. Dental Care of Children with special needs
9. Oral Manifestations of Systemic Conditions in Children & their Management
10. Management of Minor Oral Surgical Procedures in Children
11. Dental Radiology as Related to Pediatric Dentistry
12. Pediatric Oral Medicine & Clinical Pathology
13. Congenital Abnormalities in Children
14. Dental Emergencies in Children & Their Management
15. Dental Materials Used in Pediatric Dentistry
16. Case History Recording
17. Setting up of Pedodontic & Preventive Dentistry Clinic

Paper-II: Preventive and Community Dentistry as applied to Pediatric Dentistry

1. Child Psychology
2. Behavior Management
3. Child Abuse & Dental Neglect
4. Preventive Pedodontics
5. Cariology
6. Preventive Dentistry
7. Dental Health Education & School Dental Health Programmes:
8. Fluorides
9. Epidemiology
10. Comprehensive Infant Oral Health Care/Comprehensive cleft care
11. Principles of Bio-Statistics & Research Methodology & Understanding of Computers and Photography

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 / Practical and Viva-Voce Examinations are conducted for a minimum of two days.

First Day:

1. **Case Discussion, Pulp Therapy i.e. Pulpectomy on a Primary Molar.**

Case Discussion	:	20 marks
Rubber Dam application	:	10 marks
Working length X-ray	:	20 marks
Obturation	:	20 marks
Total		70 marks

2. **Case Discussion, Crown preparation on a Primary Molar for Stainless steel crown and cementation of the same.**

Case discussion	:	10 marks
Crown Preparation	:	20
marks Crown selection and Cementation	:	20 marks
Total		50 marks

3. **Case Discussion, band adaptation for fixed type of space maintainer and impression making**.

Case discussion	:	20 marks
Band adaptation	:	20 marks
Impression	:	20
marks Total		60 marks

Second Day:

1. **Evaluation of Fixed Space Maintainer and Cementation** : 20 marks

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