SYLLABUS FOR PG STUDENTS

Basic Paper

Applied anatomy of head & neck

- Development of face, paranasal sinuses & the associated structures & their anomalies, cranial & facial bones, TMJ anatomy & function, arterial & venous drainage of head & neck.
- Muscles of mastication & deglutition & their functional anatomy.
- Cranial nerves.
- Salivary glands.
- Applied histology of skin, oral mucosa, connective tissue, bone cartilage, blood vessels, lymphatics, nerves, muscles & tongue.

Human Dentition

- Detailed anatomy (external & internal) of deciduous & permanent dentition, form, function, alignment, contact & occlusion.
- Enamel- development & composition, physical characteristics, chemical properties & structure.
- Age changes.
- Dentin- development, physical & chemical properties, structure, types of dentin, innervations, age & functional changes.
- Pulp- development, histological structures, innervations function, clinical considerations.
- Cementum- development, composition, structure function, clinical considerations.
- Periodontal ligament- development, structure, function, clinical considerations.
- Eruption of teeth.
Physiology

- Mastication, deglutition, digestion, fluid & electrolyte balance.
- Blood composition, volume, function, blood groups, haemostasis, coagulation, transfusion, circulation, heart, pulse, blood pressure, shock, respiration, control, anoxia, hypoxia, asphyxia.
- Endocrinology- general principles & disorders relating to pituitary, thyroid, parathyroid & adrenal glands.
- Saliva- composition, function & clinical significance.
- Vitamins- diet & nutrition (balanced diet).
- Pain, sympathetic & para sympathetic nervous system, pain pathways, physiology of pulpal pain.
- Metabolism of carbohydrates, proteins, lipids, minerals.

Pathology

- Inflammation, repair, degeneration, necrosis & gangrene.
- Edema, ischemia, hyperemia, thrombosis, embolism, infarction, allergy & hypersensitivity.
- Blood dyscrasias.
- Neoplasms- classification of tumors, characteristics of benign & malignant tumors.

Microbiology

- Infection control, cross infection, sterilization & disinfection.
- Microbes of relevance to dentistry.
- Immunology- antigen antibody reaction, allergy, hypersensitivity & anaphylaxis, HIV infection & AIDS.
- Culture media, culturing technique & antibiotic sensitivity tests.
Pharmacology

- Dosage & route of administration of drugs, actions & fate of drug in the body, drug tolerance. (antibiotics & antiinflammatory analgesics.)
- Local anesthesia- agents & chemistry, pharmacological actions, fate, metabolism ideal properties, techniques & complications.
- General anesthesia- premedications, inhalation anesthesia, agents used.
- Anesthetic emergencies.
- Antihistamines, corticosteroids, haemostatic agents, anticoagulants, antisialogogue, immunosuppressants.

Biostatistics

- Introduction, basic concepts, sampling, collection, compilation, presentation of data, statistical averages & its interpretation.

Dental materials

- Physical & mechanical properties of dental materials & their biocompatibility.
- Manipulation, indications, contraindications, advantages, disadvantages of various restorative materials, impression materials, etc.
- Casting procedures, casting alloys, investments, inlay wax, die materials.
- Dental ceramics- recent advances & trends.
- Dental burs- design & mechanics of cutting, speed & other modalities of tooth preparation.
Conservative Dentistry

1. Examination, diagnosis & treatment planning.
2. Occlusion as related to conservative dentistry, contact, contour, its significance. Separation of teeth, matrices used in conservative dentistry.
4. Infection control procedures in conservative dentistry.
5. Isolation & its equipments.
7. Indirect composite restorations.
8. Indirect tooth colored restorations – ceramics inlays & onlays, veneers, crowns (recent advances in fabrication & materials).
10. Impression procedures used for indirect restorations.
11. Cast metal restorations, indications contraindications, tooth preparation for inlay, onlay & full crowns.
12. Direct gold restorations.
13. Recent advances in restorative materials & procedures.
15. Advance knowledge of minimal intervention dentistry.
16. Recent advances in restoration of endodontically treated teeth & grossly mutilated teeth.
17. Hypersensitivity, theories, causes & management.
18. Lasers in conservative dentistry.
19. Dental imaging & its applications in restorative dentistry.
Endodontics

1. Rationale of endodontics.
2. Knowledge of internal anatomy of permanent teeth anatomy of root apex & its management.
3. Dentin & pulp complex.
4. Pulp & periapical pathology.
5. Pathobiology of periapex.
6. Diagnostic procedure- recent advances & various aids used for diagnosis.
8. Case selection & treatment planning.
9. Infection control procedures used in endodontics(aseptic technique such as rubber dam, sterilization of instrument etc).
11. Endodontic instruments & instrumentation- recent developments, detailed description of hand, rotary, sonic, ultrasonic etc.
14. Root canal medicaments
15. Endodontic microbiology.
16. Obturating materials, various obturation technique recent advances in obturation of the root canal.
17. Traumatic injuries & management- endodontic treatment for young permanent teeth.(pediatric endodontics)
19. Endo-perio interrelationship, the lesion & its management.
20. Drugs & chemicals used in endodontics.
23. Lasers in endodontics.
24. Multidisciplinary approach to endodontic situations.
25. Geriatric endodontics.
27. Local anaesthesia in endodontics.
28. Procedural errors in endodontics & their management.
29. Endodontic failures & retreatment.
ORTHODONTICS & DENTOFACIAL ORTHOPAEDICS
PG CURRICULUM

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

SPREAD OF THE CURRICULUM:
Six months teaching o basic subjects including completion of pre – clinical exercises 2 ½ years of coverage of all the relevant topics in Orthodontics, clinical training involving treatment of patients and submission of dissertation. These may be divided into blocks of 6 to 8 months duration each, depending on the training policies of each institution.

I. APPLIED ANATOMY:
• Prenatal growth of head:
  Stages of embryonic development, origin of head, origin of face, origin of teeth.
• Postnatal growth of head:
  Bones of skull, the oral cavity, development of chin, the hyoid bone, general growth of head, face growth.
• Bone growth:
  Origin of bone, composition of bone, units of bone structure, schedule of Ossification, mechanical properties of bone, roentgen graphic appearance of bone
• 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.
• Muscles of mastication:
  Development of muscles, muscle change during growth, muscle function and facial development, muscle function and malocclusion
• Development of dentition and occlusion:
  Dental development periods, order of tooth eruption, chronology of permanent tooth formation, periods of occlusal development, pattern of occlusion.
• Assessment of skeletal age: The carpal bones, carpal x – rays, cervical vertebrae

II PHYSIOLOGY:
• **Endocrinology and its disorders**
  (Growth hormone, thyroid hormone, parathyroid hormone, ACTH) pituitary gland hormones, thyroid gland hormones, parathyroid gland hormones
• **Calcium and its metabolism**
• **Nutrition-metabolism and their disorders**: proteins, carbohydrates, fats, vitamins and minerals.
• **Muscle physiology**
• **Craniofacial Biology**: cell adhesion molecules and mechanism of adhesion
• **Bleeding disorders in orthodontics**: Hemophilia

**III DENTAL MATERIALS:**
• **Gypsum products**: dental plaster, dental stone and their properties, setting reaction etc.
• **Impression materials**: impression materials in general and particularly of alginate impression material.
• **Acrylics**: chemistry, composition physical properties
• **Composites**: composition types, properties setting reaction
• **Banding and bonding cements**: Zn (PO4)2, zinc silicophosphate, Zinc polycarboxylate, resin cements and glass ionomer cements
• **Wrought metal alloys**: deformation, strain hardening, annealing, recovery, recrystallization, grain growth, properties of metal alloys
• **Orthodontic arch wires**: stainless steel gold, wrought cobalt chromium nickel alloys, alpha & beta titanium alloys
• **Elastics**: Latex and non-latex elastics.
• **Applied physics**, Bioengineering and metallurgy.
• **Specification and tests methods** used for materials used in Orthodontics
• **Survey of all contemporary literature and Recent advances** in above – mentioned materials.

**IV. GENETICS:**
• Cell structure, DNA, RNA, protein synthesis, cell division
• Chromosomal abnormalities
• Principles of orofacial genetics
• Genetics in malocclusion
• 5 Molecular basis of genetics
• Studies related to malocclusion
• Recent advances in genetics related to malocclusion
• Genetic counseling
• Bioethics and relationship to Orthodontic management of patients.

**V. PHYSICAL ANTHROPOLOGY:**
• Evolutionary development of dentition
• Evolutionary development of jaws.

**VI. PATHOLOGY:**
• Inflammation
• Necrosis

**VII. BIOSTATISTICS:**
• Statistical principles
Data Collection
Method of presentation
Method of Summarizing
Methods of analysis – different tests/errors
  • Sampling and Sampling technique
  • Experimental models, design and interpretation
  • Development of skills for preparing clear concise and cognent scientific abstracts and publication

VIII. APPLIED RESEARCH METHODOLOGY IN ORTHODONTICS:
  • Experimental design
  • Animal experimental protocol
  • Principles in the development, execution and interpretation of methodologies in Orthodontics
  • Critical Scientific appraisal of literature.

IX. APPLIED PHARMACOLOGY

X. ORTHODONTIC HISTORY:
  • Historical perspective,
  • Evolution of orthodontic appliances,
  • Pencil sketch history of Orthodontic peers
  • History of Orthodontics in India

XI. CONCEPTS OF OCCLUSION AND ESTHETICS:
  • Structure and function of all anatomic components of occlusion,
  • Mechanics of articulation,
  • Recording of masticatory function,
  • Diagnosis of Occlusal dysfunction,
  • Relationship of TMJ anatomy and pathology and related neuromuscular physiology.

XII. ETIOLOGY AND CLASSIFICATION OF MALOCCLUSION:
  • A comprehensive review of the local and systemic factors in the causation of malocclusion
  • Various classifications of malocclusion

XIII. DENTOFACIAL ANOMALIES:
  • Anatomical, physiological and pathological characteristics of major groups of developmental defects of the orofacial structures.

XIV. CHILD AND ADULT PSYCHOLOGY:
  • Stages of child development.
  • Theories of psychological development.
  • Management of child in orthodontic treatment.
  • Management of handicapped child.
  • Motivation and Psychological problems related to malocclusion / orthodontics
  • Adolescent psychology
  • Behavioral psychology and communication
XV. DIAGNOSTIC PROCEDURES AND TREATMENT PLANNING IN ORTHODONTICS
- Emphasis on the process of data gathering, synthesis and translating it into a treatment plan
- Problem cases – analysis of cases and its management
- Adult cases, handicapped and mentally retarded cases and their special problems
- Critique of treated cases.

Cephalometrics
- Instrumentation
- Image processing
- Tracing and analysis of errors and applications
- Radiation hygiene
- Advanced Cephalometrics techniques
- Comprehensive review of literature
- Video imaging principles and application.

XVII. PRACTICE MANAGEMENT IN ORTHODONTICS:
- Economics and dynamics of solo and group practices
- Personal management
- Materials management
- Public relations
- Professional relationship
- Dental ethics and jurisprudence
- Office sterilization procedures
- Community based Orthodontics.

XVIII.CLINICAL ORTHODONTICS:

Myofunctional Orthodontics:
- Basic principles
- Contemporary appliances – their design and manipulation
- Case selection and evaluation of the treatment results
- Review of the current literature.

Dentofacial Orthopedics
- Principles
- Biomechanics
- Appliance design and manipulation
- Review of contemporary literature

Cleft lip and palate rehabilitation:
- Diagnosis and treatment planning
- Mechanotherapy
- Special growth problems of cleft cases
- Speech physiology, pathology and elements of therapy as applied to orthodontics
- Team rehabilitative procedures.

Biology of tooth movement:
• Principles of tooth movement-review
• Review of contemporary literature
• Applied histophysiology of bone, periodontal ligament
• Molecular and ultra cellular consideration in tooth movement

Orthodontic / Orthognathic surgery:
• Orthodontist' role in conjoint diagnosis and treatment planning
• Pre and post-surgical Orthodontics
• Participation in actual clinical cases, progress evaluation and post retention study
• Review of current literature

Ortho / Perio / Prostho inter relationship
• Principles of interdisciplinary patient treatment
• Common problems and their management

Basic principles of Mechanotherapy Includes Removable appliances and fixed appliances
• Design
• Construction
• Fabrication
• Management
• Review of current literature on treatment methods and results

Applied preventive aspects in Orthodontics
• Caries and periodontal disease prevention
• Oral hygiene measures
• Clinical procedures

Interceptive Orthodontics
☐ Principles
☐ Growth guidance
☐ Diagnosis and treatment planning
☐ Therapy emphasis on:
  a. Dento-facial problems
  b. Tooth material discrepancies
  c. Minor surgery for Orthodontics

Retention and relapse
☐ Mechanotherapy – special reference to stability of results with various procedures
☐ Post retention analysis
☐ Review of contemporary literature

XIX.RECENT ADVANCES LIKE:
☐ Use of implants
☐ Lasers
☐ Application of F.E.M.
☐ Distraction Osteogenesis

SKILLS:
II. Pre – Clinical Exercises
A general outline of the type of exercises is given here. Every institution can decide the details of exercises under each category.
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 regainers.
5. Bonwill Hawley Ideal arch preparation.
6. Construction of orthodontic models trimmed and polished preferably as per specifications of Tweed or A.B.O.
7. Cephalometric tracing and various Analyses, also superimposition methods –
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) Typhodont exercise
   i. Band making
   ii. Bracket positioning and placement
   iii. Different stages in treatment appropriate to technique taught
9. Clinical photography
10. Computerized imaging
11. Preparation of surgical splints, and splints for TMJ problems.
12. Handling of equipments like vacuum forming appliances and hydro solder etc.

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

First 6 Months

1. NON-APPLIANCE EXERCISES
   All the following exercises should be done with 0.7 or 0.8mm wire
   1 Straightening of 6” & 8” long wire 1 each
   2 Square 1
   3 Rectangle 1
   4 Triangle of 2” side 1
   5 Circle of 2” side 1
   6 Bending of 5U’s 1
   7 Bending of 5V’s 1

2. CLASPS
   1 ¾ Clasps 2
   2 Full clasps 2
   3 Triangular Clasps 2
   4 Adam’s clasp – upper molar 2
   5 Adam’s Clasp – lower molar 2
   6 Adam’s Clasp – Pre-molar 2
   7 Adam’s Clasp - Incisor 2
   8 Modification of Adam’s – With Helix 2
   9 Modification of Adam’s – With distal extension 2
10 Modification of Adam’s – With soldered tube 2
11 Duyzing Clasps on Molars 2
12 Southend Clasp 1

3. LABIAL BOWS
1 Short labial bow (upper & lower) 1
2 Long labial bow (upper & lower) 1
3 Robert’s retractor 1
4 High labial bow-with apron spring’s 1
5 Mill’s labial bow 1
6 Reverse loop labial bow 1
7 Retention labial bow soldered to Adam’s clasp 1
8 Retention labial bow extending distal to second molar 1
9 Fitted labial bow 1
10 Split high labial bow 1

4. SPRINGS
1 Finger spring-mesial movement 2
2 Finger spring-distal movement 2
3 Double cantilever spring 2
4 Flapper spring 2
5 Coffin spring 2
6 T spring 2

5. CANINE RETRACTORS
1 U loop canine retractor 2PAIRS
2 Helical canine retractor 2PAIRS
3 Palatal canine retractor 2PAIRS
4 Self –supporting canine retractor 2PAIRS
5 Self –supporting canine retractor 2PAIRS

6. APPLIANCES
1 Hawley’s retention appliance with anterior bite plane
2 Upper Hawley’s appliance with posterior bite plane
3 Upper expansion appliance with coffin spring
4 Upper expansion appliance with coffin spring
5 Upper expansion appliance with expansion screw
6 Habit breaking appliance with tongue crib
7 Oral screen and double oral screen
8 Lip bumper
9 Splint for Bruxism
10 Catalans appliance
11 Activator
12 Bionator
13 Frankel-FR 2 appliance
14 Twin block
15 Lingual arch
16 TPA
17 Quad helix
18 Bihelix
19 Utility arches
20 Pendulum appliance

7. Soldering exercises
   1 Star 1
   2 Comb 1
   3 Christmas tree 1
   4 Soldering buccal tube on molar bands 1

8. Welding exercises
   1 Pinching and welding of molar, premolar, canine and Incisor bands
   2 Welding of buccal tubes and brackets on molar bands and incisor bands

9. Impression of upper and lower arches in alginate

10. Study model preparation

11. Model analysis
   1 Impression of upper and lower dental arches
   2 PREPARATION OF STUDY MODEL – 1
      And all the permanent dentition analyses to be done.
   3 PREPARATION OF STUDY MODEL – 2
      And all the permanent dentition analyses to be done.
   4 PREPARATION OF STUDY MODEL – 3
      And all the mixed dentition analyses to be done.

12. Cephalometrics
   1 Lateral cephalogram to be traced in five different colors and super imposed to see the accuracy of tracing
   2 Steiner’s analysis
   3 Down’s analysis
   4 Tweed analysis
   5 Rickett’s analysis
   6 Burrrstone analysis
   7 Rakosi’s analysis
   8 Mc Namara analysis
   9 Bjork analysis
   10 Coben’s analysis
   11 Harvold’s analysis
   12 Soft tissue analysis – Holdaway and Burstone

13. Basics of Clinical Photography including Digital Photography

14. Light wire bending exercises for the Begg technique
   1 Wire bending technique on 0.016” wire circle “Z” Omega
   2 Bonwill-Hawley diagram
   3 Making a standard arch wire
   4 Inter maxillary hooks- Boot leg and Inter Maxillary type
   5 Upper and Lower arch wire
   6 Bending a double back arch wire
7 Bayonet bends (vertical and horizontal offsets)
8 Stage-III arch wire
9 Torquing auxiliary (upper)
10 Reverse Torquing (lower)
11 Up righting spring

15. **Typhodont exercises**: (Begg or P.E.A. method)
   1. Teeth setting in Class-II division I malocclusion with maxillary anterior
      Proclination and mandibular anterior crowding
   2. Band pinching, welding brackets and buccal tubes to the bands
   3. Stage-I
   4. Stage-II
   5. Pre Stage-III
   6. Stage-III

**CLINICAL WORK:**
Once the basic pre-clinical work is completed the students can take up clinical cases and the clinical training is for the two and half years.

Each postgraduate student should start with a minimum of 50 cases of his/her own.

Additionally he/she should handle a minimum of 20 transferred cases.
The type of cases can be as follows:
   i. Removable active appliances-5cases
   ii. Class-I malocclusion with Crowding
   iii. Class-I malocclusion with bi-maxillary protrusion
   iv. Class-II division-1
   v. Class-II division-2
   vi. Class-III (Orthopedic, Surgical, Orthodontic cases)
   vii. Inter disciplinary cases
   viii. Removable functional appliance cases like activator, Bionator, functional regulator, twin block and new developments
   ix. Fixed functional appliances – Herbst appliance, jasper jumper etc – 5 cases
   x. Dento-facial orthopedic appliances like head gears, rapid maxillary expansion niti expander etc., - 5 cases
   xi. Appliance for arch development such as molar distalization –m 5 cases
   xii. Fixed mechano therapy cases (Begg, PEA, Tip edge, Edgewise)
Retention procedures of above treated cases.

**Other work to be done during FIRST YEAR**
1. **Seminars:** Two Seminar per week to be conducted in the department. A minimum of five seminars should be presented by each student each year
2. **Journal club:** One Journal club per week to re conducted in the department. A minimum of five seminars should be presented by each student each year
3. **Protocol for dissertation to be submitted on or before the end of six months from the date of admission.**
4. **Under graduate classes:** Around 4 – 5 classes should be handled by each post-graduate student
5. **Field survey:** To be conducted and submit the report
6. **Inter-departmental meetings**: should be held once in a month.
7. **Case discussions**
8. **Field visits**: To attend dental camps and to educate the masses
9. **Basic subjects classes**
10. **Internal assessment or Term paper**

**Second Year:**
The clinical cases taken up should be followed under the guidance. More case discussions and cases to be taken up. Other routine work as follows.
1. **Seminars**: Two Seminar per week to be conducted in the department. Each student should present a minimum of five seminars each year.
2. **Journal club**: One Journal club per week to be conducted in the department. Each student should present a minimum of five seminars each year.
3. **Library assignment to be submitted on or before the end of six months.**
4. **Undergraduate classes**: each post-graduate student should handle around 4-5 classes.
5. **Inter-departmental meetings**: Should be held once in a month (Last Saturday of month)
6. **Case discussions**
7. **Field visits**: To attend dental camps and to educate the masses.
8. **Internal assessment or term paper.**
9. **Dissertation work**: On getting the approval from the university work for the dissertation to be started.

**Third Year:**
The clinical cases taken up should be followed under the guidance. More cases discussions and cases to be taken up. Other routine work as follows:
1. **Seminars**: One Seminar per week to be conducted in the department. Each student should present a minimum of five seminars each year.
2. **Journal Club**: One Journal club per week to be conducted in the department. A minimum of five seminars should be presented by each student each year
3. **Under graduate classes**: each post – graduate student, should handle Around 4-5 classes.
4. **Inter-departmental meetings**: Should be held once in a month.
5. **The completed dissertation should be submitted six months before the final examination**
6. **Case discussions**
7. **Field visits**: To attend dental camps and to educate the masses.
8. **Finishing and presenting the cases taken up.**
9. **Preparation of finished cases and presenting the cases** (to be presented for the examination)
10. **Mock examination**
EXAMINATION

I. Theory
   a) Paper I
      Basic & Applied subjects
      (Applied Anatomy, Physiology, pathology, Nutrition, Biostatics & Dental Materials)
   b) Paper II
      (Orthodontics – Basic Principles)
   c) Paper III
      (Clinical Orthodontics)
   d) Paper IV
      (Essay on basic, applied advanced Orthodontics)

II. Practical, Clinical and Viva Voce Examination will consist of:-
   a) Presentation of laboratory techniques, exercises.
   b) Clinical examination – case presentations (20 completed cases, at least 5 debonded).
   c) Taking working bite on the patient, preparation and fitting of a functional appliance.
   d) Making of a set of U/L arch wires, auxiliaries and fixing them on the patient.
   e) Making a cast analysis, cephalometric, photographic diagnosis and treatment planning of a given cases.
   f) Viva voce examination will consists of :-
      i) Oral examination
      ii) Case discussion
      iii) Thesis discussion
ORAL MEDICINE AND RADIOLOGY

Under Graduate Students

AIMS

(1) To train the students to diagnose the common disorders of Oro-facial region by clinical examination and with the help of such investigations as may be required and medical management of Oro-facial disorders with drugs and physical agents.

(2) To train the students about the importance, role, use and techniques of radiographs and other imaging methods in diagnosis.

(3) The principles of the clinical and radiographic aspects of Forensic Odontology.

THE SYLLABUS IN ORAL MEDICINE & RADIOLOGY is divided into two main parts.

(I) Diagnosis, Diagnostic methods and Oral Medicine

(II) Oral Radiology.

Again the part ONE is subdivided into three sections.

(A) Diagnostic methods

(B) Diagnosis and differential diagnosis

(C) Oral Medicine & Therapeutics.

COURSE CONTENT

(1) Emphasis should be laid on oral manifestations of systemic diseases and ill-effects of oral sepsis on general health.

(2) To avoid confusion regarding which lesion and to what extent the student should learn and know, this elaborate syllabus is prepared. As certain lesions come under more than one group, there is repetition.

Part-I ORAL MEDICINE AND DIAGNOSTIC AIDS

SECTION (A) – DIAGNOSTIC METHODS.
(1) Definition and importance of Diagnosis and various types of diagnosis

(2) Method of clinical examinations.
   (a) General Physical examination by inspection.
   (b) Oro-facial region by inspection, palpation and other means
   (c) To train the students about the importance, role, use of saliva and techniques of
diagnosis of saliva as part of oral disease
   (d) Examination of lesions like swellings, ulcers, erosions, sinus, fistula, growths,
pigmented lesions, white and red patches
   (e) Examination of lymph nodes
   (f) Forensic examination – Procedures for post-mortem dental examination; maintaining
dental records and their use in dental practice and post-mortem identification;
jurisprudence and ethics.

(3) Investigations
   (a) Biopsy and exfoliative cytology
   (b) Haematological, Microbiological and other tests and investigations necessary for
diagnosis and prognosis

SECTION (B) – DIAGNOSIS, DIFFERENTIAL DIAGNOSIS

While learning the following chapters, emphasis shall be given only on diagnostic aspects
including differential diagnosis

(1) Teeth: Developmental abnormalities, causes of destruction of teeth and their sequelae
and discoloration of teeth

(2) Diseases of bone and Osteodystrophies:
Development disorders: Anomalies, Exostosis and tori, infantile cortical hyperostosis,
esteogenisis imperfecta, Marfans syndrome, osteopetrosis. Inflammation – Injury, infection
and spread of infection, fascial space infections, osteoradionecrosis.

Metabolic disorders – Histiocytosis

Endocrine – Acromegaly and hyperparathyroidism

Miscellaneous – Paget’s disease, Mono and polyostotic fibrous dysplasia, Cherubism.

(3) Temporomandibular joint: Developmental abnormalities of the condyle. Rheumatoid
arthritis, Osteoarthritis, Sub-luxation and luxation.

(4) Common cysts and Tumors:

CYSTS: Cysts of soft tissue: Mucocele and Ranula

Cysts of bone: Odontogenic and nonodontogenic.

TUMORS:
(1) Soft Tissue:
Epithelial: Papilloma, Carcinoma, Melanoma
Connective tissue: Fibroma, Lipoma, Fibrosarcoma
Vascular: Haemangioma, Lymphangioma
Nerve Tissue: Neurofibroma, Traumatic Neuroma, Neurofibromatosis
Salivary Glands: Pleomorphic adenoma, Adenocarcinoma, Warthin’s Tumor, Adenoid cystic carcinoma.

1. Hard Tissue:
Non Odontogenic: Osteoma, Osteosarcoma, Osteoclastoma, Chondroma, Chondrosarcoma, Central giant cell tumor, and Central haemangioma
Odontogenic: Enameloma, Ameloblastoma, Calcifying Epithelial Odontogenic tumor, Adenomatoid Odontogenic tumor, Periapical cemental dysplasia and odontomas

(5) Periodontal diseases: Gingival hyperplasia, gingivitis, periodontitis, pyogenic granuloma

(6) Granulomatous diseases: Tuberculosis, Sarcoïdosis, Midline lethal granuloma, Crohn’s Disease and Histiocytosis X

(7) Miscellaneous Disorders: Burkitt lymphoma, sturge – Weber syndrome, CREST syndrome, rendu-osler-weber disease

SECTION (C): ORAL MEDICINE AND THERAPEUTICS.
The following chapters shall be studied in detail including the etiology, pathogenesis, clinical features, investigations, differential diagnosis, management and prevention

(1) Infections of oral and paraoral structures:
Bacterial: Streptococcal, tuberculosis, syphillis, vincent’s, leprosy, actinomycosis, diphtheria and tetanus
Fungal: Candida albicans
Virus: Herpes simplex, herpes zoster, ramsay hunt syndrome, measles, herpangina, mumps, infectious mononucleosis, AIDS and hepatitis-B

(2) Important common mucosal lesions:
White lesions: Chemical burns, leukodema, leukoplakia, fordyce spots, stomatitis nicotina palatinus, white sponge nevus, candidiasis, lichenplanus, discoid lupus erythematososis
Veiculo-bullous lesions: Herpes simplex, herpes zoster, herpangina, bullous lichen planus, pemphigus, cicatrical pemphigoid erythema multiforme.
Ulcers: Acute and chronic ulcers

Pigmented lesions: Exogenous and endogenous

Red lesions: Erythroplakia, stomatitis venenata and medicamentosa, erosive lesions and denture sore mouth.

(3) Cervico-facial lymphadenopathy

(4) Facial pain:

(i) Organic pain: Pain arising from the diseases of orofacial tissues like teeth, pulp, gingival, periodontal tissue, mucosa, tongue, muscles, blood vessels, lymph tissue, bone, paranasal sinus, salivary glands etc.,

(ii) Pain arising due to C.N.S. diseases: (a) Pain due to intracranial and extracranial involvement of cranial nerves. (Multiple sclerosis, cerebrovascular diseases, trotter’s syndrome etc.)

(b) Neuralgic pain due to unknown causes: Trigeminal neuralgia, glossopharyngeal neuralgia, sphenopalatine ganglion neuralgia, periodic migrainous neuralgia and atypical facial pain

(iii) Referred pain: Pain arising from distant tissues like heart, spine etc.

(5) Altered sensations: Cacogeusia, halitosis

(6) Tongue in local and systemic disorders:

(Aglossia, ankyloglossia, bifid tongue, fissured tongue, scrotal tongue, macroglossia, microglossia, geographic tongue, median rhomboid glossitis, depapillation of tongue, hairy tongue, atrophic tongue, reactive lymphoid hyperplasia, glossodynia, glossopyrosis, ulcers, white and red patches etc.)

(7) Oral manifestations of:

(i) Metabolic disordeers: (a) Porphyria, (b) Haemochromatosis, (c) Histocytosis X diseases

(ii) Endocrine disorders: (a) Pituitary: Gigantism, acromegaly, hypopituitarism, (b) Adrenal cortex: Addison’s disease (Hypofuntion), Cushing’s syndrome (Hyperfunction), (c) Parathyroid glands: Hyperparathyroidism, (d) Thyroid gland: (Hypothyroidism) Cretinism, myxedema, (e) Pancreas: Diabetes

(iii) Nutritional deficiency: Vitamins: riboflavin, nicotinic acid, folic acid Vitamin B12, Vitamin C (Scurvy)

(iv) Blood disorders: (a) Red blood cell diseases: Deficiency anemias: (Iron deficiency, plummer – vinson syndrome, pernicious anemia), Haemolytic anemia’s: (Thalassemia, sickle cell anemia, erythroblastosis fetalis, Aplastic anemia Polycythemia
(b) White Blood cell diseases: Neutropenia, cyclic neutropenia, agranulocytosis, infectious mononeucleosis and leukemias

c) Haemorrhagic disorders: Thrombocytopenia, purpura, hemophilia, chrismas disease and von willebrand’s disease

(8) Disease of salivary glands:


(9) Dermatological diseases with oral manifestations:

(a) Ectodermal dysplasia (b) Hyperkerotosis palmarplantaris with periodontopathy (c) Scleroderma (d) Lichen planus including Ginspan’s syndrome (e) Lupus erythematosus (f) Pemphigus (g) Erythema multiforme (h) Psoriasis

(10) Immunological diseases with oral manifestations

(a) Leukemia (b) Lymphomas (c) Multiple Myeloma (d) AIDS clinical manifestations, opportunistic infections, neoplasms (e) Thrombocytopenia (f) Lupus Erythematosus (g) Scleroderma (h) Dermatomyositis (I) Sub mucous Fibrosis (j) Rheumatoid arthritis (k) Recurrent oral ulcerations including Behcet’s syndrome and Reiter’s syndrome

(11) Allergy: Local allergic reactions, anaphylaxis, serum sickness (local and systemic allergic manifestations to food drugs and chemicals)

(12) Foci of oral infection and their ill effects on general health

(13) Management of dental problems in medically compromised persons:

(i) Physiological changes: Puberty, pregnancy and menopause

(ii) The patients suffering with cardiac, respiratory, liver, kidney and bleeding disorders, hypertension, diabetes and AIDS. Post-irradiated patients.

(14) Precancerous lesions and conditions

(15) Nerve and muscle diseases:

(i) Nerves: (a) Neuropraxia (b) Neurotemesis (c) Neuritis (d) Facial nerve paralysis including Bell’s palsy, Heerfordt’s syndrome, Melkerson Rosenthal syndrome and Ramsay hunt syndrome (e) Neuroma (f) Neurofibromatosis (g) Frey’s syndrome

(ii) Muscles: (a) Myositis ossificans (b) Myofascial pain dysfunction syndrome (c) Truisms
(16) **Forensic odontology:** (a) Medico legal aspects of orofacial injuries, (b) Identification of bite marks, (c) Determination of age and sex, (d) Identification of cadavers by dental appliances, Restorations and tissue remnants

(17) **Therapeutics:**

General therapeutic measures – drugs commonly used in oral medicine viz., antibiotics, chemotherapeutic agents, anti-inflammatory and analgesic drugs, astringents, mouth washes, styptics, demulcents, local surface anesthetic, sialagogues, anti-sialagogues and drugs used in the treatment of malignancy

**Part – II ORAL RADIOLOGY**

(1) **Scope of the subject and history of origin**

(2) **Physics of radiation:** (a) Nature and types of radiations, (b) Source of radiations, (c) Production of X-rays, (d) Properties of X-rays, (e) Compton effect, (f) Photoelectric effect, (g) Radiation measuring units

(3) **Biological effects of radiation**

(4) **Radiation safety and protection measures**

(5) **Principles of image production**

(6) **Radiographic techniques:**

(i) **Intra-Oral:** (a) Periapical radiographs (Bisecting and parallel technics), (b) Bite wing radiographs,(c) Occlusal radiographs

(ii) **Extra-oral:** (a) Lateral projections of skull and jaw bones and paranasal sinuses, (c) Cephalograms

(d) Orthopantomograph, (e) Projections of temperomandibular joint and condyle of mandible

(f) Projections for Zygomatic arches

(iii) **Specialized techniques:** (a) Sialography, (b) Xeroradiography,(c) Tomography

(7) **Factors in production of good radiographs:**

(a) K.V.P. and mA. Of X-ray machine (b) Filters (c) Collimations (d) Intensifying screens (e) Grids (f) X-ray films (g) Exposure time (h) Techniques (i) Dark room (j) Developer and fixer solutions (k) Film processing

(8) **Radiographic normal anatomical landmarks**

(9) **Faculty radiographs and artifacts in radiographs**

(10) **Interpretation of radiographs in various abnormalities of teeth, bones and other oro-facial tissues**
(11) **Principles of radiotherapy of oro-facial malignancies and complications of radiotherapy**

(12) **Contrast radiography and basic knowledge of radio-active isotopes**

(13) **Radiography in Forensic Odontology –**

Radiographic age estimation and post-mortem radiographic methods

**PRACTICALS / CLINICALS:**

1. Student is trained to arrive at proper diagnosis by following a scientific and systematic procedure of history taking and examination of the oro-facial region. Training is also imparted in management wherever possible. Training also shall be imparted on saliva diagnostic procedures. Training also shall be imparted in various radiographic procedures and interpretation of radiographs.

2. In view of the above each student shall maintain a record of work done, which shall be evaluated for marks at the time of university examination

3. The following is the minimum of prescribed work for recording

   (a) Recording of detailed case histories of interesting cases ………. 10

   (b) Intra-oral radiographs (Peri-apical, bitewing, occlusal) …………. 25

   (c) Saliva diagnostic check as routine procedure
ORAL MEDICINE AND RADIOLOGY

Post Graduate Students

COURSE CONTENTS:

Applied Basic Sciences

Applied Anatomy

1. Gross anatomy of the face:

   a. Muscles of Facial Expression And Muscles Of Mastication
   b. Facial nerve
   c. Facial artery
   d. Facial vein
   e. Parotid gland and its relations

2. Neck region:

   a. Triangles of the neck with special reference to Carotid, Digastric triangles and midline structures
   b. Facial spaces
   c. Carotid system of arteries, Vertebral Artery, and Subclavian arteries
   d. Jugular system
   Internal jugular
   External jugular
   e. Lymphatic drainage
   f. Cervical plane
   g. Muscles derived from Pharyngeal arches
   h. Infratemporal fossa in detail and temporomandibular joint
i. Endocrine glands
   Pituitary
j. Sympathetic chain
k. Cranial nerves- V, VII, IX, XI, & XII
   • Thyroid
   • Parathyroid
l. Exocrine glands
   • Parotid
   • Thyroid
   • Parathyroid

3. Oral Cavity:
   a. Vestibule and oral cavity proper
   b. Tongue and teeth
   c. Palate – soft and hard

4. Nasal Cavity
   a. Nasal septum
   b. Lateral wall of nasal cavity
   c. Paranasal air sinuses

5. Pharynx:

Gross salient features of brain and spinal cord with references to attachment of cranial nerves to the brainstem
Detailed study of the cranial nerve nuclei of V, VII, IX, X, XI, XII
Osteology: Comparative study of fetal and adult skull
Mandible:
Development, ossification, age changes and evaluation of mandible in detail

EMBRYOLOGY:
1. Development of face, palate, nasal septum and nasal cavity, paranasal air sinuses
2. Pharyngeal apparatus in detail including the floor of the primitive pharynx
3. Development of tooth in detail and the age changes
4. Development of salivary glands
5. Congenital anomalies of face must be dealt in detail.

HISTOLOGY:
1. Study of epithelium of oral cavity and the respiratory tract
2. Connective tissue
3. Muscular tissue
4. Nervous tissue
5. Blood vessels
6. Cartilage
7. Bone and tooth
8. Tongue
9. Salivary glands
10. Tonsil, thymus, lymph nodes

PHYSIOLOGY:
1. General Physiology:
   • Cell
   • Body Fluid Compartments
     - Classification
     - Composition
   • Cellular transport
   • RMP and action potential

MUSCLE NERVE PHYSIOLOGY:
1. Structure of a neuron and properties of nerve fibers
2. Structure of muscle fibers and properties of muscle fibers
3. Neuromuscular transmission
4. Mechanism of muscle contraction

BLOOD:
1. RBC and Hb
2. WBC – Structure and functions
3. Platelets – functions and applied aspects
4. Plasma proteins
5. Blood Coagulation with applied aspects
6. Blood groups
7. Lymph and applied aspects

**RESPIRATORY SYSTEM:**
- Air passages, composition of air, dead space, mechanics of respiration with pressure and volume changes
- Lung volumes and capacities and applied aspects
- Oxygen and carbon dioxide transport
- Neural regulation of respiration
- Chemical regulation of respiration
- Hypoxia, effects of increased barometric pressure and decreased barometric pressure

**CARDIO-VASCULAR SYSTEM:**
- Cardiac Cycle
- Regulation of heart rate / Stroke volume / cardiac output / blood flow
- Regulation of blood pressure
- Shock, hypertension, cardiac failure

**EXCRETORY SYSTEM:**
- Renal function tests
**Gastro – intestinal tract:**
Composition, functions and regulation of:
- Saliva
- Gastric juice
- Pancreatic juice
- Bile and intestinal juice
- Mastication and deglutition
ENDOCRINE SYSTEM:
• Harmones – classification and mechanism of action
• Hypothalamic and pituitary hormones
• Thyroid harmones
• Parathyroid harmones and calcium homeostasis
• Pancreatic harmones
• Adrenal harmones

CENTRAL NERVOUS SYSTEM:
• Ascending tract with special references to pain pathway

SPECIAL SENSES:
• Gustation and Olfaction

BIOCHEMISTRY:
1. Carbohydrates – Disaccharides specifically maltose, lactose, sucrose
   - Digestion of starch/absorption of glucose
   - Metabolism of glucose, specifically glycolysis, TCA cycle, gluconeogenesis
   - Blood sugar regulation
   - Glycogen storage regulation
   - Glycogen storage diseases
   - Galactosemia and fructosemia
2. Lipids
   - Fatty acids- Essential/non essential
   - Metabolism of fatty acids- oxidation, ketone body formation, utilization ketosis
   - Outline of cholesterol metabolism- synthesis and products formed from cholesterol
3. Protein
   - Amino acids- essential/non essential, complete/ incomplete proteins
   - Transamination/ Deamination (Definition with examples)
   - Urea cycle
   - Tyrosine-Harmones synthesized from tyrosine
   - In born errors of amino acid metabolism
   - Methionine and transmethylation
4. Nucleic Acids
- Purines/Pyrimidines
- Purine analogs in medicine
- DNA/RNA – Outline of structure
- Transcription/translation
- Steps of protein synthesis
- Inhibitors of protein synthesis
- Regulation of gene function

5. Minerals
- Calcium/Phosphorus metabolism specifically regulation of serum calcium levels
- Iron metabolism
- Iodine metabolism
- Trace elements in nutrition

6. Energy Metabolism
- Basal metabolic rate
- Specific dynamic action (SDA) of foods

7. Vitamins
- Mainly these vitamins and their metabolic role- specifically vitamin A, Vitamin C, Vitamin D,
  Thiamin, Riboflavin, Niacin, Pyridoxine

PATHOLOGY:
1. Inflammation:
   • Repair and regeneration, necrosis and gangrene
   • Role of complement system in acute inflammation
   • Role of arachidonic acid and its metabolites in acute inflammation
   • Growth factors in acute inflammation
   • Role of molecular events in cell growth and intercellular signaling cell surface receptors
   • Role of NSAIDS in inflammation
   • Cellular changes in radiation injury and its manifestations

Homeostasis:
• Role of Endothelium in thrombo – genesis
• Arterial and venous thrombi
• Disseminated Intravascular Coagulation

Shock:
• Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock, circulatory disturbances, ischemic hyperemia, venous congestion, edema, infarction

Chromosomal Abnormalities:
• Marfan’s syndrome
• Ehler’s Danlos Syndrome
• Fragile X Syndrome

Hypersensitivity:
• Anaphylaxis
• Type II Hypersensitivity
• Type III Hypersensitivity
• Cell mediated Reaction and its clinical importance
• Systemic Lupus Erythmatosus
• Infection and infective granulomas

Neoplasia:
• Classification of Tumors
• Carcinogenesis & Carcinogens – Chemical, Viral and Microbial
• Grading and Staging of Cancer, tumor Angiogenesis, Paraneoplastic Syndrome
• Spread of tumors
• Characteristics of benign and malignant tumors

Others:
• Sex linked agamaglobulinemia
• AIDS
• Management of Immune deficiency patients requiring surgical procedures
• De George’s Syndrome
• Ghons complex, post primary pulmonary tuberculosis – pathology and Pathogenesis

PHARMACOLOGY:
1. Definition of terminologies used
2. Dosage and mode of administration of drugs
3. Action and fate of drugs in the body
4. Drugs acting on the CNS
5. Drug addiction, tolerance and hypersensitive reactions
6. General and local anesthetics, hypnotics, antiepileptics, and tranquilizers
7. Chemotherapeutics and antibiotics
8. Analgesics and anti-pyretics
9. Anti-tubercular and anti-syphilitic drugs
10. Antiseptics, sialogogues, and anti-sialogogues
11. Haematinics
12. Anti-diabetics
13. Vitamins – A B Complex, C, D, E, K
14. Steroids

Oral And Maxillofacial Radiology

Study includes Seminars / lectures / Demonstrations
1. History of radiology, structure of x-ray tube, production of x-ray, property of x-rays
2. Biological effects of radiation
3. Filtration of collimation, grids and units of radiation
4. Films and recording media
5. Processing of image in radiology
6. Design of x-ray department, dark room and use of automatic processing units
7. Localization by radiographic techniques
8. Faults of dental radiographs and concept of ideal radiograph
9. Quality assurance and audit in dental radiology
10. Extra – oral-imaging techniques
11. OPG and other radiologic techniques
12. Advanced imaging technique like CT Scan, MRI, Ultrasound & thermo graphic
13. Radio nucleotide techniques
14. Contrast radiography in salivary gland, TMJ, and other radiolucent pathologies
15. Radiation protection and ICRP guidelines
16. Art of radiographic report, writing and descriptors preferred in reports
17. Radiograph differential diagnosis of radiolucent, radio opaque and mixed lesions
18. Digital radiology and its various types of advantages

Oral Medicine, therapeutics and laboratory investigations
1. Study includes seminars / lectures / discussion
2. Methods of clinical diagnosis of oral and systemic diseases as applicable to oral tissue including modern diagnostic techniques
3. Laboratory investigations including special investigations of oral and oro – facial diseases
4. Teeth in local and systemic diseases, congenital, and hereditary disorders
5. Oral manifestations of systemic diseases
6. Oro – facial pain
7. Psychosomatic aspects of oral diseases
8. Management of medically compromised patients including medical emergencies in the dental chair
9. Congenital and Hereditary disorders involving tissues of oro facial region
10. Systemic diseases due to oral foci of infection
11. Hematological, Dermatological, Metabolic, Nutritional, & Endocrinal conditions with oral manifestations
12. Neuromuscular diseases affecting oro –facial region
13. Salivary gland disorders
14. Tongue in oral and systemic diseases
15. TMJ dysfunction and diseases
16. Concept of immunity as related to oro – facial lesions, including AIDS
17. Cysts, Neoplasms, Odontomes, and fibro – osseous lesions
18. Oral changes in Osteo – dystrophies and chondro – dystrophies
19. Pre malignant and malignant lesions of oro facial region
20. Allergy and other miscellaneous conditions
21. Therapeutics in oral medicine –clinical pharmacology
22. Forensic odontology
23. Computers in oral diagnosis and imaging
24. Evidence based oral care in treatment planning
25. Molecular Biology

ESSENTIAL KNOWLEDGE:
Basic medical subjects, Oral Medicine, Clinical Dentistry, Management of Medical Emergencies, Oral Radiology, Techniques and Inter – Operation, Diagnosis of Oro – facial Disorders

10. ETHICS IN DENTISTRY

COURSE CONTENT :
Introduction to ethics –
- What are ethics?
- What are values and norms?
- How to form a value system in one’s personal and professional life?
- Hippocratic oath.

Ethics of the individual –
The patient as a person.
Right to be respected
Truth and confidentiality
Autonomy of decision
Doctor Patient relationship

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

Research Ethics –
Animal and experimental research/humanness
Human experimentation
Human volunteer research-informed consent
Drug trials
Ethical workshop of cases
Gathering all scientific factors
Gathering all value factors
Identifying areas of value – conflict, setting of priorities
PAEDODONTICS & 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.

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
1. Applied Anatomy & genetics
2. Applied Physiology
3. Applied Pathology
4. Nutrition and Dietics
5. 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.
8. Child Abuse & Dental Neglect
9. Conscious Sedation, Deep Sedation & General Anesthesia in Pediatric Dentistry: (Including Other Drugs, Synergic & Antagonistic Actions of Various Drugs Used in Children
13. Gingival & Periodontal diseases in Children:
   - Normal Gingiva & Periodontium in children.
   - Gingival & Periodontal diseases - Etiology, Pathogenesis, Prevention & Management
14. 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 pvi systems.
15. Pediatric Endodontics:
   a. Primary Dentition: - Diagnosis of pulpal diseases and their management - Pulp capping, Pulpotomy, Pulpectomy (Materials & Methods), Controversies & recent concepts.
   b. Young permanent teeth and permanent teeth, Pulp capping, Pulpotomy, Apexogenesis, Apexitication, Concepts, Techniques and Materials used for different procedures.
   c. Recent advances in Pediatric diagnosis and Endodontics.
16. Prosthetic consideration in-Paediatric Dentistry.
17. Traumatic Injuries in Children:
   - Classifications & Importance.
   - Sequelae & reaction of teeth to trauma.
   - Management of Traumatized teeth with latest concepts.
   - Management of jaw fracture in children.
18. Interceptive Orthodontics:
b. A comprehensive review of the local and systemic factors in the causation of malocclusion.
c. Recognition and management of normal and abnormal developmental occlusions in primary, mixed and permanent dentitions in children (Occlusal Guidance).

d. 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.
e. Myofunctional appliances: Basic principles, contemporary appliances: Design & Fabrication
f. Removable appliances: Basic principles, contemporary appliances: Design & Fabrication
g. Case selection & diagnosis in interceptive Orthodontics (Cephalometric, Image processing, Tracing, Radiation hygiene, Video imaging 8s advance Cephalometric techniques).
h. Space Management: Etiology, Diagnosis of space problems, analysis, Biomechanics,
Planned extraction in interception orthodontics.

19. Oral Habits in Children:
• Definition, Etiology & Classification
• Clinical features of digit sucking, tongue thrusting, mouth breathing 8s various other secondary habits.
• Management of oral habits in children
20. Dental ware of Children with special needs:
• Definition Etiology, Classification, Behavioral, Clinical features 8s Management of children with:
• Physically handicapping conditions
• Mentally compromising conditions
• Medically compromising conditions
• Genetic disorders

21. Oral manifestations of Systemic Conditions in Children 8s their Management
22. Management of Minor Oral Surgical Procedures in Children
23. Dental Radiology as related to Pediatric Dentistry
24. Cariology
• Historical background
• Definition, Etiology & Pathogenesis
• Caries pattern in primary, young permanent and permanent teeth in children.
  • Rampant caries, early childhood caries and extensive caries. Definition, etiology, Pathogenesis, Clinical features, Complications 8s Management.
• Role of diet and nutrition in Dental Caries
• Dietary modifications 8s Diet counseling.
• Subjective 8s objective methods of Caries detection with emphasis on Caries Activity tests, Caries prediction, Caries susceptibility 8s their clinical Applications

25. Pediatric Oral Medicine 8s Clinical Pathology: Recognition 8s Management of developmental dental anomalies, teething disorders, stomatological conditions, mucosal lesions, viral infections etc.
27. Dental Emergencies in Children and their Management.
29. Preventive Dentistry:
  • Definition
  • Principles 8s Scope
  • Types of prevention
  • Different preventive measures used in Pediatric Dentistry including fissure sealants and caries vaccine.

30. Dental Hearth Education 8s School Dental Health Programmes
31. 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
32. Fluorides:
  • Historical background
  • Systemic & Topical fluorides
  • Mechanism of action
  • Toxicity & Management.
  • Defluoridation techniques.

33. Medicological aspects in Paediatric Dentistry with emphasis on informed concept.
34. Counseling in Paediatric Dentistry
35. Case History Recording, Outline of principles of examination, diagnosis & treatment planning.
39. Comprehensive cleft care management with emphasis on counseling, feeding, nasoalveolar bone remodeling, speech rehabilitation.
40. Setting up of Pedodontics & Preventive Dentistry Clinic.
41. Emerging concept in Paediatric Dentistry of scope of laser/minimum invasive procedures:

1ST YEAR

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
3. Fabrication of
   a. Maxillary bite plate / Hawley's'
   b. Maxillary expansion screw appliance
   c. Canine retractor appliance
   d. All habit breaking appliances
      i. Removable type
      ii. Fixed type
      iii. Partially fixed and removable
   e. Two Myofunctional appliances
   f. Making of inclined plane appliance
   g. Feeding appliances
4. Basic soldering exercise I - making of a lamppost of stainless steel wire pieces of different gauges soldered on either side of heavy gauge main post.
5. Fabrication of space maintainers
   a. Removable type-
      • Unilateral Non-functional space maintainer
      • Bilateral Non-Functional space maintainer
      • Unilateral functional space maintainer
      • Bilateral functional space maintainer
   b. Space Regainers -
      • Hawley's appliances with Helical space regainer
      • Removable appliance with Slingshot space regainer
      • Removable appliance with Dumbbell space regainer
   c. Fixed Space maintainers
      • Band & long loop space maintainer
      • Band & short loop space maintainer
      • Mayne's space maintainer
      • Transpalatal arch space maintainer
      • Nance Palatal holding arch
      • Nance Palatal holding arch with canine stoppers
      • Gerber space regainer
      • Distal shoe appliance
         a. Active space maintainers
         b. For guiding the eruption of first permanent molar -rags
         c. Arch holding device
         d. Functional space maintainer
6. Basics for spot welding exercise
7. 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 Excercies : 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

8. Performing of behavioral rating and IQ tests for children.
9. Computation of:
   - Caries index and performing various carrier activity test.
   - Oral Hygiene Index
   - Periodontal Index
   - Fluorosis Index

10. Surgical Exercises: a. Fabrication of splints b. Type of Wiring c. Suturing, various pivot system, pricing & poring. tuli
    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 is analysis.

11. Mixed dentition cast analysis
12. 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:

<table>
<thead>
<tr>
<th>No.</th>
<th>Clinical Work</th>
<th>Total</th>
<th>7 To 12 Months</th>
<th>13 To 24 Months</th>
<th>25 To 36 Months</th>
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<tbody>
<tr>
<td>1</td>
<td>Behavior Management of different age groups children with complete records.</td>
<td>17’</td>
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<td>10</td>
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<tr>
<td>2</td>
<td>Detailed Case evaluation with complete records, treatment planning and presentation of cases with chair side and discussion</td>
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<td>3</td>
<td>Step-by-step chair side preventive dentistry scheduled for high risk children with gingival and periodontal diseases &amp; Dental Caries</td>
<td>11</td>
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<td>4</td>
<td>Practical application of Preventive dentistry concepts in a class of 35-50 children &amp; Dental Health Education &amp; Motivation.</td>
<td>7</td>
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<td>5</td>
<td>Pediatric Operative Dentistry with application of recent concepts. (a) Management of Dental Caries (I) Class I</td>
<td>50</td>
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<th>(II) Class II</th>
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<td>(III) Other Restorations</td>
<td>20</td>
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<tr>
<td>(b) Management of traumatized anterior teeth</td>
<td>15</td>
<td>04</td>
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<td>(c) Aesthetic Restorations</td>
<td>25</td>
<td>05</td>
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<td>(d) Pediatric Endodontic Procedures- Deciduous teeth</td>
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<tr>
<td>Pulpotomy /Pulpectomy</td>
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<td>Permanent Molars-</td>
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<td>7</td>
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<tr>
<td>Permanent Incisor-</td>
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<td>3</td>
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<tr>
<td>Apexification &amp; Apexogenesis</td>
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<td>02</td>
<td>08</td>
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<td>6</td>
<td>Stainless Steel Crowns</td>
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<td>10</td>
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<tr>
<td>7</td>
<td>Other Crowns</td>
<td>05</td>
<td>01</td>
<td>02</td>
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<td>8</td>
<td>Fixed Space Maintainers</td>
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<td>08</td>
<td>12</td>
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<td>Removable Space Maintainers</td>
<td>20</td>
<td>05</td>
<td>07</td>
<td>08</td>
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<tr>
<td>10</td>
<td>Functional Maintainers</td>
<td>05</td>
<td>01</td>
<td>02</td>
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Preventive measures like fluoride applications & Pit & Fissure Sealants applications with complete follow-up and diet counseling

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<tr>
<th>11</th>
<th>Special Assignments(i)</th>
<th>20</th>
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<td>School Dental Health Programmes</td>
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<td>(ii) Camps etc.,</td>
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12 Library usage
14. Laboratory usage

15. Continuing Dental Health Programme
(The figures given against SI. 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 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 Section IV.

Scheme of Examination

A. Theory 300 Marks

Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 75. Paper I, II and III shall consist of two long questions carrying 20 marks each and 5 short essay questions carrying 7 marks each. Paper IV will be on Essay. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: *


**PAPER-II** : 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 Interceptive Orthodontics
6. Oral Habits in children
7. Dental Care of Children with special needs
8. Oral Manifestations of Systemic Conditions in Children & their Management
9. Management of Minor Oral Surgical Procedures in Children
10. Dental Radiology as Related to Pediatric Dentistry
11. Pediatric Oral Medicine & Clinical Pathology
12. Congenital Abnormalities in Children
13. Dental Emergencies in Children & Their Management
14. Dental Materials Used in Pediatric Dentistry
15. Case History Recording
16. Setting up of Pedodontic & Preventive Dentistry Clinic

PAPER III: 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 8s School Dental Health Programmes
8. Fluorides
9. Epidemiology
10. Comprehensive Infant Oral Health Care/Comprehensive cleft care

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

B. Practical 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

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

Case discussion, band adaptation for fixed type of space maintainer and-inch 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 is 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.

PROCEDURAL AND OPERATIVE SKILLS SHOULD BE AS ON

1st yr-
- Examination of patients case history recording- 100
- FNAC- 50
- Biopsy- 50
- Observe assist and perform under supervision
- Intra oral radiographs perform under interpretation

2nd yr-
1. Dental treatment to medically compromised patients
   - Observe, assist, and perform under supervision
2. Extra - oral radiographs, digital radiography 20
   - Observe, assist and perform under supervision

Operative skills:
1. Giving intra — muscular and intravenous injections
2. Administration of oxygen and life saving drugs to the patients
3. Performing basic CPR and certification by Red Cross

3rd Year
All the above
Performed independently - Case history: Routine cases - 100
Interesting Cases - 25
Intra - oral Radiographs - 100
Periapical view - 100
Bitewing view - 50
Occlusal view - 50
Extra — oral radiographs of different views – 100