CURRICULUM OF MDS COURSES

Orthodontics and Dentofacial Orthopaedics

Conservative Dentistry & Endodontics

CONTENTS:-

1. Syllabus of Orthodontics and Dentofacial Orthopaedics
2. Syllabus of Conservative Dentistry & Endodontics

SYLLABUS

The syllabus for post-graduate course includes both Applied Basic Sciences and subjects of concerned specialty. The syllabus in Applied Basic Sciences shall vary according to the particular speciality, similarly thecandidates shall also acquire adequate knowledge in other subjects related to their respective speciality.

SYLLABUS DISTRIBUTION IN VARIOUS SPECIALITIES:

(v) ORTHODONTICS AND DENTOFACIAL ORTHOPEDICS

Part-I

Paper-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 maloclusion, Dentofacial Anomalies, Diagnostic procedures and treatment planning in Orthodontics, Practice management in Orthodontic
Paper II : Clinical Orthodontics
Paper III :Descriptive and analysing type question

ORTHODONTICS & DENTOFACIAL ORTHOPAEDICS

COURSE CONTENT:

Theprogram outlined,addressesboththeknowledgeneededinOrthodonticsandalliedMedical specialitiesin itsscope.Aminimumof threeyears offormaltrainingthrough agraded systemof educationasspecifies,willequipthetraineewithskill andknowledgeatitscompletiontobeableto practice basicOrthodonticsandhavetheabilitytointelligentlypursuefurther apprenticeshiptowards advanced Orthodontics.

SPREADOF THE CURRICULUM:

Sixmonthsteaching ohasic subjectsincluding completionofpre –clinicalexercises2½ years of coverage of allthe relevanttopicsinOrthodontics,clinicaltraininginvolvingtreatmentofpatients and submission ofdissertation.These maybe divided into blocks of6 to 8 months durationeach, depending onthe training policies of each institution.

I. APPLIED ANATOMY:

- Prenatal growth of head:
  Stages of embryonic development, origin ofhead, origin of face, origin of teeth.
- Postnatal growth of head:
  Bones ofskull, the oral cavity, development ofchin, the hyoid bone, general growth of head, face growth.

- Bone growth:
  Origin of bone, composition of bone, unitsof bone structure, schedule of Ossification, mechanical properties of bone, roentgen graphic appearance of bone
- Assessment of growth anddevelopment:
  Growthprediction,growthspurts,theconceptofnormalityandgrowthincrementsofgrowth,
  differentialgrowth,gradientofgrowth,methodsofgatheringgrowthdata.Theoriesofgrowth
  and recent advances, factors affecting physical growth.
- Muscles of mastication:
  Developmentof muscles,muscle change during growth, muscle function and facial development, muscle function and malocclusion
- Developmentof dentition and occlusion:
  Dental development periods, order of tooth eruption, chronology of permanent tooth formation, periods of occlusal development, pattern ofocclusion.
- Assessment of skeletal age
  The carpal bones, carpal x – rays, cervical vertebrae

II **PHYSIOLOGY:**

- **Endocrinologyand its disorders**

  (Growth hormone, thyroid hormone, parathyroidhormone, 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**
- **CraniofacialBiology**: ell adhesion molecules and mechanism of adhesion
- **Bleeding disorders in orthodontics:Hemophilia**

III **DENTAL MATERIALS:**

- **Gypsum products:**dentalplaster, dental stone and their properties, setting reaction etc.
- **Impression materials:**impressionmaterialsin generaland particularlyof alginateimpression material.

- **Acrylics:** chemistry, composition physical properties
- **Composites:**compositiontypes, properties setting reaction
- **Bandingandbondingcements:**$Zn(PO_4)_2$,zincsilicophosphate,Zincpolycarboxylate,resin cements and glass Ionomer cements
- **Wroughtmetalalloys:**deformation,strainhardening,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 testsmethods** used for materials used in Orthodontics
- **Survey of all contemporary literature and Recent advances** in above – mentioned materials.

IV. GENETICS:

- Cell structure,DNA, RNA, proteinsynthesis, cell division
- Chromosomal abnormalities
- Principles of orofacial genetics
- Genetics in malocclusion
- 5 Molecular basis of genetics
- Studies related to malocclusion
- Recent advances in geneticsrelated tomalocclusion
- Genetic counseling
- Bioethics andrelationship to Orthodontic managementof patients.

V. PHYSICALANTHROPOLOGY:

- Evolutionarydevelopment of dentition
- Evolutionarydevelopment 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 andSampling technique
- Experimentalmodels, design and interpretation
- Development of skills for preparing clear concise and cognent scientific abstracts and publication

VIII. APPLIEDRESEARCH METHODOLOGY IN ORTHODONTICS:

- Experimentaldesign
- Animal experimental protocol
- Principles in the development, execution and interpretation of methodologies inOrthodontics
- Critical Scientificappraisal of literature.

IX. APPLIED PHARMACOLOGY

X. ORTHODONTIC HISTORY:

- Historical perspective,
- Evolution of orthodontic appliances,
- Pencil sketchhistory of Orthodontic peers
- History of Orthodontics in India

XI. CONCEPTSOF OCCLUSION AND ESTHETICS:

- Structure andfunction of all anatomiccomponents of occlusion,
- Mechanics ofarticulation,
- Recording ofmasticatory function,
- Diagnosis ofOcclusal dysfunction,
- Relationship of TMJ anatomy and pathology and related neuromuscular physiology.

XII. ETIOLOGYAND CLASSIFICATION OF MALOCCLUSION:

- A comprehensive review of the local andsystemic factors in thecausation of malocclusion
- Various classifications ofmalocclusion

XIII. DENTOFACIAL ANOMALIES:

- Anatomical,physiologicalandpathologicalcharacteristicsofmajorgroupsofdevelopmental defects of the orofacial structures.

XIV. CHILD ANDADULT PSYCHOLOGY:

- Stages of child development.
- Theories of psychologicaldevelopment.
- Management of child in orthodontic treatment.
- Management of handicapped child.
- Motivation and Psychological problemsrelated to malocclusion / orthodontics
- Adolescent psychology
- Behavioral psychology andcommunication

XV. *DIAGNOSTIC PROCEDURES AND TREATMENT PLANNING INORTHODONTICS*

- Emphasis on the process ofdata gathering, synthesisand translating it into a treatment plan
- Problemcases – analysis ofcases and its management
- Adult cases,handicappedand mentallyretardedcases and their special problems
- Critique of treated cases.

Cephalometrics

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

XVII. PRACTICEMANAGEMENT IN ORTHODONTICS:

- Economics and dynamicsof 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 designand 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.

Biologyof 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 treatmentplanning
- Pre and post-surgical Orthodontics
- Participation in actualclinical 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 literatureon treatmentmethods andresults

Applied preventive aspects in Orthodontics

- Caries and periodontal disease prevention
- Oral hygienemeasures
- Clinical procedures

InterceptiveOrthodontics

Principles
Growth guidance
Diagnosis and treatment planning
Therapy emphasis on:

a. Dento-facial problems
b. Tooth material discrepancies
c. Minorsurgery for Orthodontics

Retention and relapse

Mechanotherapy – specialreference to stability of results with various procedures
Post retention analysis
Review of contemporary literature

XIX.RECENTADVANCES LIKE:

Use of implants
Lasers
Application of F.E.M.
Distraction Osteogenesis

SKILLS:

II. **Pre – ClinicalExercises**

Ageneraloutlineofthetypeofexercisesisgivenhere.Everyinstitutioncandecidethedetailsof exercises under eachcategory.

1. General Wirebending exercisesto develop the manual dexterity.
2. Clasps, Bows and springsused in the removable appliances.
3. Soldering and welding exercises.
4. Fabricationofremovablehabitbreaking,mechanicalandfunctionalappliances,alsoallt ypesof space maintainers andspace regainers.
5. Bonwill Hawley Ideal arch preparation.
6. Constructionoforthodonticmodelstrimmedandpolishedpreferablyasperspecificationsof Tweed or A.B.O.
7. Cephalometric tracing and various Analyses, alsosuperimposition methods –
8. Fixed appliance typhodont exercises.

   a) Training shall be imparted in one basic technique i.e. Standard Edgewise / Begg technique or its derivative / Straight wire etc., with adequate exposure to other techniques.

   b) Typhodont exercise

      i. Band making

      ii. Bracket positioning and placement

      iii. Differentstages in treatment appropriate to technique taught

9. Clinical photography

10. Computerized imaging

11. Preparation ofsurgical 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 exercisesshould be done with 0.7 or 0.8mm wire

Sl.No.	Exercise	No.
1	Straighteningof 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

Sl.No	Exercise	No.
1	¾ Clasps	2
2	Fullclasps	2
3	Triangular Clasps	2
4	Adam'sclasp– upper molar	2
5	Adam'sClasp – lower molar	2
6	Adam'sClasp – Pre-molar	2
7	Adam'sClasp - 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 solderedtube	2
11	Duyzing Clasps on Molars	2
12	SouthendClasp	1

3. LABIAL BOWS

Sl.No.	Exercise	No.
1	Short labial bow (upper & lower)	1
2	Long labial bow (upper & lower)	1
3	Robert'sretractor	1
4	High labial bow-with apronspring's	1
5	Mill's labial bow	1
6	Reverse looplabial bow	1
7	Retention labial bowsoldered to Adam'sclasp	1
8	Retention labial bow extending distal to second molar	1
9	Fitted labial bow	1
10	Split high labial bow	

4.SPRINGS

Sl.No.	*Exercise*	*No.*
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	

5. CANINE RETRACTORS

Sl.No.	*Exercise*	*No.*
1	U loopcanineretractor	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

Sl.No.	Exercise
1	Hawley's retention appliance with anterior bite plane
2	Upper Hawley's appliancewith 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 appliancewith tongue crib
7	Oralscreen 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

Sl.No.	Exercise	No.
1	Star	1
2	Comb	1
3	Christmas tree	1
4	Soldering buccal tube on molar bands	1

8. Welding exercises

Sl.No.	*Exercise*
1	Pinching andwelding of molar, premolar, canine andIncisor bands
2	Welding of buccal tubes and brackets onmolar bands and incisor bands

9. Impressionof upper andlower arches in alginate

10. Studymodel preparation

11. Model analysis

Sl.No.	*Exercise*
1	Impression ofupper and lower dental arches
2	PREPARATION OF STUDY MODEL – 1
3	PREPARATION OF STUDY MODEL – 2
4	PREPARATION OF STUDY MODEL – 3

12. Cephalometrics

Sl.No.	Exercise
1	Lateralcephalogramtobetracedinfivedifferentcolorsandsuperimposedtoseethe
2	Steiner's analysis

3	Down's analysis
4	Tweed analysis
5	Rickett's analysis
6	Burrstone 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 Photographyincluding Digital Photography**

14. **Lightwire bending exercises fortheBegg technique**

Sl.No.	Exercise
1	Wire bendingtechnique on0.016' wire circle"Z" Omega
2	Bonwill-Hawley diagram
3	Making a standard archwire
4	Inter maxillary hooks- Bootleg and InterMaxillary 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)

Sl.No	Exercise
1	TeethsettinginClass-IIdivisionImalocclusionwithmaxillaryanteriorProclinationand 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

CLINICALWORK:

Oncethebasicpre-clinicalworkiscompletedthestudentscantakeupclinicalcasesandtheclinical training is forthe two and half years.

Each postgraduate student should start with a minimum of 50 cases of his/her own. Additionallyhe/she should handle a minimum of 20 transferredcases.

The type of cases can beas follows:

i. Removable active appliances-
5cases ii. Class-I malocclusionwith
Crowding

iii. Class-I malocclusionwith 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 likeheadgears, rapid maxillaryexpansion niti expander etc.,- 5 cases

xi. Appliance forarch development such asmolar distalization –m 5
cases xii. Fixed mechano therapy cases (Begg, PEA, Tip edge,
Edgewise)

Retention proceduresof above
treatedcases.

Otherwork to be done during FIRST YEAR

1. **Seminars:**OneSeminarperweektobeconductedinthedepartment.Aminimumoffive seminars should be presented by eachstudent each year
2. **Journalclub**:OneJournalclubperweektoreconductedinthedepartment.Aminimumoffive seminars should be presented by eachstudent each year
3. **Protocolfordissertationtobesubmittedonorbeforetheendofsixmonthsfromthe date of admission.**
4. **Undergraduateclasses**:Around4–5classesshouldbehandledbyeachpost-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. **Fieldvisits: To attend dental camps and to educate the masses**

9. Basic subjects classes

10. Internal assessment or Term paper

Second Year:

Theclinicalcasestakenupshouldbefollowedundertheguidance.Morecasediscussionsandcases to be taken up. Other routine work as follows.

1. **Seminars**: OneSeminarperweektobeconductedinthedepartment.Each student should Present a minimum of five seminars each year.

2. **Journalclub:** OneJournalclubperweektobeconductedinthedepartment.Eachstudent 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 4-5classes.

5. **Inter-departmental meetings**: Should be held once in a month

6. **Case discussions**

7. **Fieldvisits: To attend dental camps and to educate the masses.**

8. **Internal assessment or term paper.**

9. **Dissertationwork**:Ongettingtheapprovalfromtheuniversityworkforthedissertationtobe started.

Third Year:

Theclinicalcasestakenupshouldbefollowedundertheguidance.Morecasesdiscussionsand cases to be taken up. Other routine work as follows:

1. **Seminars**:OneSeminarperweektobeconductedinthedepartment.Eachstudentshould present a minimum of five seminars each year.

2. **JournalClub**:OneJournalclubperweektobeconductedinthedepartment.Aminimumof five seminars should be presented by each student each year

3. **Under graduate classes**: each post – graduate student, should handle Around4-5 classes.

4. **Inter-departmental meetings**: Should be held once in a month.

5. **The completed dissertation should be submitted <u>six months</u> 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*

CONSERVATIVE DENTISTRY AND ENDODONTICS

Part-I

Paper-I: Applied Basic Sciences: Applied Anatomy, Physiology, Pathology including Oral Microbiology, Pharmacology, Biostatistics and Research Methodology and Applied Dental Materials.

Part-II

Paper-I : Conservative Dentistry

Paper-II: Endodontics

Paper-III : Descriptive and analyzing type question

CONSERVATIVE DENTISTRY AND ENDODONTICS

Human Values, Ethical Practice and Communication

Abilities

- Adopt ethical principlesinallaspects ofrestorativeandcontemporariesEndodonticsincluding non-surgicaland surgicalEndodontics.
- Professiona lhonesty and integrity should be the top priority.
- Dentalcarehastobeprovidedregardlessofsocialstatus,caste,creedorreligionofthe patient.
- Developcommunicationskillsinparticulartoexplainvariousoptionsavailablemanagement and to obtaina true informed consent from the patient.
- Apply high moral and ethical standardswhilecarryingon human oranimal research
- He/Sheshallnotcarryoutanyheroicproceduresandmustknowhislimitationsinperforming allaspectsofrestorative dentistryincludingEndodontics.Askforhelpfrom colleagues or seniors whenrequiredwithout hesitation
- Respect patient's rights and privileges including patients right to information.

COURSE CONTENTS: 10

APPLIED ANATOMY OFHEAD ANDNECK

- Developmentofface,paranasalsinusesandtheassociatedstructuresandtheiranomalies, cranialandfacialbones,TMJanatomyandfunction,arterialandvenousdrainageofhead and neck,musclesoffaceandneckincluding musclesofmastication anddeglutition,brief consideration of structuresand function ofbrain.Briefconsiderationof all cranialnervesand autonomicnervoussystemofheadandneck.Salivaryglands,Functional anatomyof mastication, deglutitionandspeech.Detailedanatomyofdeciduousandpermanentteeth, general considerationinphysiology ofpermanentdentition,form,function,alignment,contact, occlusion.)
- Internal anatomy of permanent teeth andits significance
- Appliedhistology–histologyofskin,oralmucosa,connectivetissue,bonecartilage,blood vessels, lymphatics, nerves, muscles, tongue.

DEVELOPMENT OF TEETH: 15

- Enamel – development and composition, physical characteristics, chemical properties, structure
- Age changes– clinical structure
- Dentin – development, physical and chemical properties, structure type of dentin, innervations,age and functional changes.
- Pulp – development, histological structures, innervations, functions, regressive changes, clinical considerations.
- Cementum –composition, cementogenesis, structure,function, clinical consideration.
- Periodontal ligament – development, structure, function andclinical consideration.
- Salivary glands – structure,function, clinical considerations.
- Eruption of teeth.

10

APPLIED PHYSIOLOGY:

- Mastication, deglutition, digestion and assimilation, fluid and electrolyte balance.
- Blood composition, volume, function, blood groups, haemostasis, coagulation, blood transfusion, circulation, heart, pulse, blood pressure, shock, respiration, control, anoxia, hypoxia,asphyxia,artificialrespiration, andendocrinology– generalprinciplesofendocrine activity and disorders relating to pituitary, thyroid, parathyroid, adrenals including pregnancy and lactation.
- Physiology ofsaliva – composition, function, clinical significance.
- Clinical significance of vitamins, diet and nutrition – balanced diet.
- Physiology of pain, sympathetic and Para sympathetic nervous system, pain pathways, physiologyofpulpalpain,OdontogenicandnonOdontogenicpain,paindisorders–typical andatypical,biochemistrysuchasosmoticpressure,electrolyticdissociation,oxidation, reductionetc.Carbohydrates,proteins, lipidsandtheirmetabolism,nucleoproteins,nucleic acid and their metabolism. Enzymes, vitamins and minerals, metabolism of inorganic elements, detoxification in the body, anti metabolites, chemistry of blood lymphand urine.

10

PATHOLOGY:

- Inflammation,repair, degeneration, necrosis and gangrene.
- Circulatorydisturbances–ischemia,hyperemia,edema,thrombosis,embolism,infarction, allergy and hypersensitivity reaction.
- Neoplasms – classifications of tumors, characteristics of benign and malignant tumors, spread tumors.
- Blood dyscrasias
- Developmental disturbances of oral and Para oral structures, dental caries, regressive changesofteeth,pulp,periapicalpathology,pulp reactiontodentalcariesanddental procedures.
- Bacterial, viral,mycotic infections of the oral cavity.

MICROBIOLOGY:

- Pathwaysofpulpalinfection,oralfloraandmicroorganismsassociatedwithendodontic diseases, pathogenesis, hostdefense, bacterialvirulencefactors,healing,theoryof focal infections,microbesorrelevancetodentistry–strepto, staphylococci,lactobacilli, cornyebacterium,actinomycetes,clostridium,neisseria,vibrio, bacteriods,fusobacteria, spirochetes, mycobacterium, virus and fungi.

- Cross infection, infection control, infection control procedure, sterilization and disinfection.

- Immunology – antigen antibody reaction, allergy, hypersensitivity and anaphylaxis, auto immunity,grafts,viralhepatitis,HIV infectionsandaids.Identificationandisolationof microorganismsfrominfectedrootcanals.Culture mediumandculturingtechnique(Aerobic and anaerobic interpretation and antibiotic sensitivity test).

PHARMACOLOGY:

- Dosageandrouteofadministrationofdrugs,actionsandfateofdruginbody,drugaddiction, tolerance of hypersensitivity reactions.
- Localanesthesia–agentsandchemistry,pharmacologicalactions,fateandmetabolismof anaesthetic, ideal properties, techniques and complications.
- Generalanesthesia–premedications,neuromuscularblockingagents,inductionagents, inhalation anesthesia, and agents used, assessment of anesthetic problems in medically compromisedpatients.
- Anaesthetic emergencies
- Antihistamines, corticosteroids, chemotherapeutic and antibiotics, drug resistance, haemostasis, andhaemostaticagents, anticoagulants,sympathomimiticdrugs,vitaminsand minerals (A,B,C,D,E,KIRON),antisialogogue,immunosupressants,druginteractions, antiseptics, disinfectants, anti viral agents, drugs acting on CNS.

BIOSTATISTICS: 10

- Introduction,Basicconcepts,Sampling,Healthinformationsystems– collection,compilation, presentation ofdata.Elementarystatisticalmethods– presentationofstatisticaldata, Statistical averages – measures of central tendency, measures of dispersion, Normal distribution.Testsof significance–parametricandnon–parametrictests (Fisherextracttest, Signtest,Mediantest,Mann Whitneytest,Krusical Wallisone wayanalysis, Friedmann two way analysis,Regression analysis), Correlation and regression, Use of computers.

RESEARCH METHODOLOGY: 10

- Essential features of a protocol forresearch in humans
- Experimentaland non-experimentalstudy designs
- Ethical considerations of research

APPLIED DENTAL MATERIALS: 15

- Physical andmechanical properties of dental materials, biocompatibility.
- Impressionmaterials,detailedstudyofvariousrestorativematerials,restorativeresinand recent advances in composite resins, bonding- recent developments- tarnish and corrosion, dental amalgam, direct filling gold, casting alloys, inlay wax, die materials,investments, castingprocedures,defects,dental cementsfor restorationandpulpprotection (luting,liners, bases) cavity varnishes.
- Dentalceramics-recent advances, finishing and polishing materials.
- Dental burs –design andmechanics ofcutting– other modalitiesof tooth preparation.
- Methods of testing biocompatibility of materials used.

CONSERVATIVE DENTISTRY

1. Examination, diagnosis and treatment plan
2. Occlusionasrelatedtoconservativedentistry,contact,contour,itssignificance.Separationof teeth, matrices, used inconservative dentistry.
3. Dental caries- epidemiology, recent concept of etiological factors, pathophysiology, Histopathology,diagnosis,cariesactivitytests,preventionofdentalcariesandmanagement– recent methods.
4. Hand and rotary cutting instruments, development of rotary equipment, speed ranges, hazards.
5. Dentalbursandothermodalitiesoftoothreparation-recentdevelopments(airabrasions,lasers etc)
6. Infection control procedures in conservative dentistry, isolation equipments etc.
7. Directconceptsintoothpreparationforamalgam,composite,GICandrestorativetechniques, failures andmanagement.
8. Direct and indirectcomposite restorations.
9. Indirect tooth colored restorations- ceramic, inlays and onlays, veneers, crowns, recent advances in fabrication and materials.
    a. Tissue management
10. Impression procedures usedfor indirect restorations.
11. Castmetalrestorations,indications,contraindications,toothpreparationforclass2inlay,Onlay full crown restorations.
    Restorativetechniques,directandindirectmethodsoffabricationincludingmaterialsusedfor fabrication like inlay wax, investment materials and
12. Direct goldrestorations.
13. Recent advances in restorative materials and procedures.
14. Management of non-carious lesion.
15. Advanceknowledge of minimal intervention dentistry.
16. Recent advances in restoration of endodontically treated teeth and grossly mutilated teeth
17. Hypersensitivity,theories, causes and management.
18. Lasers in Conservative Dentistry
19. CAD-CAM &CAD-CIM in restorative dentistry
20. Dental imaging and its applications in restorative dentistry (clinical photography)
21. Principles of esthetics
    - Color
    - Facial analysis

- Smile design
- Principles of esthetic integration
- Treatment planning in esthetic dentistry

ENDODONTICS

1. Rationale of ndodontics.
2. Knowledgeofinternalanatomyofpermanentteeth,anatomyofrootapexanditsimplicationsi n endodontic treatment.
3. Dentin and pulp complex.
4. Pulp and periapical pathology
5. Pathobiology of periapex.
6. Diagnostic procedure – recent advances and variousaids used for diagnosis- a. Orofacial dental pain emergencies: endodontic diagnosis and management
7. Case selection and treatment planning
8. Infectioncontrolproceduresusedin Endodontics(aseptictechniquessuchasrubberdam, sterilization ofinstrumentsetc.)
9. Access cavity preparation – objectives and principles
10. Endodonticinstrumentsandinstrumentation–recentdevelopments,detaileddescriptionof hand, rotary, sonic, ultra sonic etc..
11. Working length determination / cleaning and shaping of root canal system and recent development in techniques of canal preparation.
12. Rootcanalirrigantsandintracanalmedicamentsusedincludingnon–surgicalEndodonticsby calcium hydroxide.
13. Endodontic microbiology.
14. Obturatingmaterials,variousobturationtechniquesandrecentadvancesinobturationofroot canal.
15. Traumatic injuries and management – endodontic treatment for young permanent teeth. Pediatric Endodontics – treatment of immature apex.
16. Endodonticsurgeries,recentdevelopmentsintechniqueanddevices,endoosseousendodontic implants – biology of boneand wound healing.
17. Endoperio interrelationship,endo + Perio lesion andmanagement
18. Drugs and chemicals usedin Endodontics
19. Endo emergencies and management.
20. Restoration ofendodontically treated teeth, recent advances.

21. Geriatric Endodontics
22. Endo emergencies and management.
23. Biologicresponse of pulp to various restorative materials and operative procedures.
24. Lasers in Endodontics.
25. Multidisciplinary approachto endodontics situations.
26. Endodontics radiology- digital technology in endodontics practice.
27. Local anesthesia in endodontics.
28. Procedural errors in endodontics and their management.
29. Endodontics failures and retreatment.
30. Resorptions and its management.
31. Microscopes in endodontics.
32. Single visit endodontics, current concepts and controversies.

TEACHING /LEARNING ACTIVITIES:

Thefollowingistheminimumrequiredtobecompletedbeforethecandidatecanbeconsidered eligible to appear for final MDS exam.

Pre Clinical Work – Operative and Endodontics

Preclinicalwork on typhodont teeth

1. Class 2 amalgam cavities
   a. Conservative preparation - 03
   b. Conventionalpreparation - 03

2. Inlay cavity preparation onpremolars

And molars – MO, DO, MOD - 10

   a. Wax pattern - 06
   b. Casing - 04

3. Onlay preparation on molars -

   02 a. Casting

   - 01

4. Full Crown

   a. Anterior - 05
   b. Posterior - 05

   (2 each to be processed)

5. 7/8 crown - 02

6. 3 / 4 crown premolars - 02

Pre Clinical work on natural teeth

1. Inlay on molars and premolars MO, DO, and MOD - 08
   a. Casting- 02
   b. Wax pattern - 02
2. Amalgam cavity preparation
   a. Conventional - 02
   b. Conservative - 02

3. Pin retained amalgam on molar teeth - 02

4. Post and core build
   b. Posterior teeth - 05

5. Casting
   b. Posterior - 02

6. Onlay on molars - 03
   (1 to be processed)

7. Full crown premolars and molars - 04

8. Full crown anterior - 06
   (2 and 3 to be processed)

9. Veneers anterior teeth(indirect method) - 02

10. Composite inlay (class 2) (1 to be processed) - 03

11. Full tooth wax carving – all permanent teeth

ENDODONTICS:

1. Sectioning of all maxillary and mandibular teeth.

2. Sectioning of teeth – in relation to deciduous molar, 2nd primary upper and lowermolar 1 each

3. Access cavity opening androot canal therapy inrelation to maxillary and mandibular permanent teeth

4. Access cavity preparation and BMP
   Anterior

   a. Conventionalprep
   b. Step back
   c. Crown down

   Obturation 03

5. BMP Premolar 06 (2 upper and 2 lower) obturation 1 each

6. BMP Molar 06 (3 upper –2 first molars and1 second molar, 3 lower – 2 first molars and

   1 second molar) obturation1 each

7. Post andcore preparationand fabrication inrelation to anterior and posterior teeth a. Anterior 10 (casting 4)

   b. Posterior 05 (casting 2)

8. Removable dies 04

Note : Techniquework tobe completed in the firstfour months

CLINICALWORK:

A	Compositerestorations	30
B	GIC Restorations	30
C	Complex amalgam restorations	05
D	Composite inlay + veneers(direct and indirect)	05
E	Ceramic jacketcrowns	05
F	Post andcore for anteriorteeth	05
G	Bleaching vital	05
	Non vital	05
H	RCT Anterior	20
I	Endo surgery– observation and assisting	05

Presentationof:

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

Case discussion- 5

1	Ceramic jacket crowns	10
2	Post andcore for anteriorteeth	10
3	Post andcore for posterior teeth	05
4	Compositerestoration	05
5	Full crown for posterior teeth	15
6	Cast gold inlay	05
7	Otherspecialtypes of work such as splinting	05
8	AnteriorRCT	20
9	Posterior RCT	30
10	Endo surgeryperformed independently	05
11	Management of endo – Perio problems	05

- Under graduate teaching program as allotted by the HOD
- Seminars – 5by each student
- Journalclub– 5 by eachstudent
- Dissertationwork
- Prepare scientific paper and present in conference and clinical meeting
- Library assignment to be submitted 18 months after starting of thecourse
- Internal assessment – theory and clinical

Dissertationwork to besubmitted 6 months before final examination.

Clinicalwork

- Cast gold inlay- Onlay, cuspal restoration 10
- Post andcore 20
- Molar endodontics 50
- Endo surgery 05
- All other types of surgeries including crownlengthening, perioesthetics, hemi sectioning, splinting, replantation, endodontic implants.

Presentationof:

- Seminars
- Journalclub
- Teaching – lecture(undergraduates)
- Internal assessment – theory and clinical