

BRANCH IX - ORAL MEDICINE AND RADIOLOGY

OBJECTIVES:

At the end of 3 years of training the candidate should be able to acquire adequate knowledge of the discipline.

Knowledge:

Theoretical, Clinical and practical knowledge of all oral mucosal lesions, skeletal involvement of maxillofacial region, diagnostic procedures pertaining to them and latest information of imaging modules.

Skills:

Three important skills need to be imparted in maxillofacial diseases

1. Diagnostic skill in recognition of oral diseases with radiographic diagnosis and their management
2. Research skills in handling scientific problems pertaining to oral treatment
3. Clinical and Didactic skills in encouraging younger doctors to attain learning objectives

Attitudes:

The positive mental attitude and the persistence of continued learning need to be inculcated

COURSE CONTENTS:

A) 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
 - f. Sub mandibular salivary 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
 - Thyroid
 - Parathyroid

j. Exocrine glands

- Parotid
- Thyroid
- Parathyroid

k. Sympathetic chain

l. Cranial nerves- V, VII, IX, XI, & XII

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:

6. 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

7. Osteology:

a) Comparative study of fetal and adult skull

b) 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:

a. Cell

b. Body Fluid Compartments

c. Classification

d. Composition

e. Cellular transport

f. RMP and action potential

2. Muscle Nerve Physiology:

a. Structure of a neuron and properties of nerve fibers

b. Structure of muscle fibers and properties of muscle fibers

c. Neuromuscular transmission

d. Mechanism of muscle contraction

3. Blood:

- a. RBC and Hb
- b. WBC – Structure and functions
- c. Platelets – functions and applied aspects
- d. Plasma proteins
- d. Blood Coagulation with applied aspects
- f. Blood groups
- g. Lymph and applied aspects

4. Respiratory System:

- a. Air passages, composition of air, dead space, mechanics of respiration with pressure and volume changes
- b. Lung volumes and capacities and applied aspects
- c. Oxygen and carbon dioxide transport
- d. Neural regulation of respiration
- e. Chemical regulation of respiration
- f. Hypoxia, effects of increased barometric pressure and decreased barometric pressure

5. Cardio-Vascular System:

- a. Cardiac Cycle
- b. Regulation of heart rate/ Stroke volume / cardiac output / blood flow
- c. Regulation of blood pressure
- d. Shock, hypertension, cardiac failure

6. Excretory System:

- a. Renal function tests

7. Gastro – intestinal tract:

- a. Composition, functions and regulation of:
 - Saliva
 - Gastric juice
 - Pancreatic juice
 - Bile and intestinal juice
 - Mastication and deglutition

8. Endocrine System:

- a. Hormones – classification and mechanism of action
- b. Hypothalamic and pituitary hormones
- c. Thyroid hormones
- d. Parathyroid hormones and calcium homeostasis
- e. Pancreatic hormones
- f. Adrenal hormones

9. Central Nervous System:

- a. Ascending tract with special references to pain pathway

10. Special Senses:

- a. Gustation and Olfaction

Biochemistry:

1. Carbohydrates – Disaccharides specifically maltose, lactose, sucrose
 - a. Digestion of starch/absorption of glucose
 - b. Metabolism of glucose, specifically glycolysis, TCA cycle, gluconeogenesis
 - c. Blood sugar regulation
 - d. Glycogen storage regulation
 - e. Glycogen storage diseases
 - f. Galactosemia and fructosemia

2. Lipids
 - a. Fatty acids- Essential/non essential
 - b. Metabolism of fatty acids- oxidation, ketone body formation, utilization ketosis
 - c. Outline of cholesterol metabolism- synthesis and products formed from cholesterol

3. Protein
 - a. Amino acids- essential/non essential, complete/ incomplete proteins
 - b. Transamination/ Deamination (Definition with examples)
 - c. Urea cycle
 - d. Tyrosine-Hormones synthesized from tyrosine
 - e. In born errors of amino acid metabolism
 - f. Methionine and transmethylation

4. Nucleic Acids
 - a. Purines/Pyrimidines
 - b. Purine analogs in medicine
 - c. DNA/RNA – Outline of structure
 - d. Transcription/translation
 - e. Steps of protein synthesis
 - f. Inhibitors of protein synthesis
 - g. Regulation of gene function

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

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

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

Pathology:

1. Inflammation:
 - a. Repair and regeneration, necrosis and gangrene
 - b. Role of complement system in acute inflammation
 - c. Role of arachidonic acid and its metabolites in acute inflammation
 - d. Growth factors in acute inflammation
 - e. Role of molecular events in cell growth and intercellular signaling cell surface receptors
 - f. Role of NSAIDS in inflammation
 - g. Cellular changes in radiation injury and its manifestations

2. Homeostasis:

- a. Role of Endothelium in thrombo genesis
- b. Arterial and venous thrombi
- c. Disseminated Intravascular Coagulation
- d. Shock: Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock, circulatory disturbances, ischemic hyperemia, venous congestion, edema, infarction

3. Chromosomal Abnormalities:

- a. Marfan's syndrome
- b. Ehler's Danlos Syndrome
- c. Fragile X Syndrome

4. Hypersensitivity:

- a. Anaphylaxis
- b. Type II Hypersensitivity
- c. Type III Hypersensitivity
- d. Cell mediated Reaction and its clinical importance
- e. Systemic Lupus Erythmatosus
- f. Infection and infective granulomas

5. Neoplasia:

- a. Classification of Tumors
- b. Carcinogenesis & Carcinogens – Chemical, Viral and Microbial
- c. Grading and Staging of Cancer, tumor Angiogenesis, Paraneoplastic Syndrome
- d. Spread of tumors
- e. Characteristics of benign and malignant tumors

6. Others:

- a. Sex linked agamaglobulinemia
- b. AIDS
- c. Management of Immune deficiency patients requiring surgical procedures
- d. De George's Syndrome
- e. 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 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

B) 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. Films and recording media
4. Processing of image in radiology
5. Design of x –ray department, dark room and use of automatic processing units
6. Localization by radiographic techniques
7. Faults of dental radiographs and concept of ideal radiograph
8. Quality assurance and audit in dental radiology
9. Extra – oral-imaging techniques
10. OPG and other radiologic techniques
11. Advanced imaging techniques like **CBCT**,CT Scan, MRI, Ultrasound
12. Basic Anatomy of sectional imaging with case interpretations of CT / CBCT / MRI
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

C) Oral Medicine, therapeutics and laboratory investigations:

Study includes seminars / lectures / discussion

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

Essential Knowledge:

Basic medical subjects, Oral Medicine, Clinical Dentistry, Management of Medical Emergencies, Oral Radiology techniques and Interpretation, Diagnosis of Oro – facial disorders

Procedural and Operative Skills:

1st Year:

1. Examination of Patients	- Case history recordings	-	100
	- Interesting case recording	-	05
	- FNAC	-	50
	- Biopsy	-	50
	(Observe, Assist, & Perform under supervision)		
2. Intra – oral radiographs:			
	- Perform and interpretation	-	500
3. Full mouth intra oral radiograph tracings		-	03
4. Age estimation using radiographs		-	10
5. Extra – oral radiographs		-	50
	(Observe, Assist, & Perform under supervision)		

2nd Year:

1. Case history recordings	-	100	
2. Interesting case recording	-	05	
3. Dental treatment to medically compromised patients	-	02	
	(Observe, assist, and perform under supervision)		
4. FNAC/ Biopsy	-	25	
5. Intra – oral radiographs:			
	(Perform and interpretation	-	200
6. Extra oral radiographs, digital radiography	-	50	
	(Observe, assist and perform under supervision, Interpretation)		
7. Extra Oral radiographs tracings	-	03	
8. CBCT Interpretations	-	05	

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 or similar authorized organization

3rd Year

All the above

- Performed independently – Case history: Routine cases	-	100
- Interesting Cases	-	25
- FNAC/Biopsy	-	25
- OPG	-	50
- Periapical view	-	100
- Bitewing view	-	50
- Occlusal view	-	50
- Extra – oral radiographs of different views	-	50
- CBCT Interpretations	-	10
- Treatment of mucosal lesions with LASER	-	03

Minimum academic requirements for each student:

1. Radiographic tracings of all intraoral & extra oral radiographs including TMJ - 02 each
2. Age estimation by radiographic methods - 10 cases
3. Journal Discussions- 10 per year
4. Seminar presentation- 5 per year
5. Interesting case recordings – 5 per year
6. Lectures for undergraduates- 2 per year
7. Intraoral radiographs- 200 per year
8. Extraoral radiographs- 50 per year
9. Case history recordings- 75 per year
10. FNAC/ Biopsy – 25 per year
11. Scientific presentations - 1
12. Speciality conferences/ PG conventions attended – 2

Monitoring Learning Progress:

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

Research methodology-

All MDS candidates shall compulsorily attend the Research Methodology Workshop conducted by the University within 6 months from the date of joining the course. In this regard, the candidates will be issued a completion Certificate by the University.

TEACHING LEARNING METHODS (including Clinical Study)

(a) LECTURES:

There shall be some didactic lectures in the speciality and in the allied fields. The departments shall encourage guest lectures in the required areas and integrated lectures by multi-disciplinary teams on selected topics, to strengthen the training programmes.

(b) JOURNAL REVIEW:

The journal review meetings shall be held at least once a week. All trainees, associate and staff associated with the post-graduate programme are expected to participate actively and enter relevant details in the logbook. The trainee shall make presentations from the allotted journals of selected articles.

(c) SEMINARS:

The seminars shall be held at least twice a week in each department. All trainees are expected to participate actively and enter relevant details in logbook.

(d) SYMPOSIUM:

It is recommended to hold symposium on topics covering multiple disciplines.

(e) CLINICAL POSTINGS:

Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases.

(f) CLINICO-PATHOLOGICAL CONFERENCE:

The clinico pathological conference shall be held once a month involving the faculties of Oral Medicine and Radiology, Oral Pathology and allied clinical departments. The trainees shall be encouraged to present the clinical details, radiological and histo-pathological interpretations and participation in the discussions.

(g) INTER-DEPARTMENTAL MEETINGS:

To encourage integration among various specialities, there shall be inter-departmental meeting chaired by the Dean with all heads of post-graduate departments at least once a month.

(h) TEACHING SKILLS:

All the trainees shall be encouraged to take part in undergraduate teaching programmes either in the form of lectures or group discussion.

(i) DENTAL EDUCATION PROGRAMMES:

Each department shall organise dental education programmes on regular basis involving other institutions. The trainees shall also be encouraged to attend such programmes conducted outside their university or institute.

(j) CONFERENCES/WORKSHOPS/ADVANCED COURSES:

The trainees shall be encouraged to attend conference/workshops/advanced courses and also to present at least two scientific papers and two posters at State/national level speciality and allied conferences/conventions during the training period.

(k) ROTATION AND POSTING IN OTHER DEPARTMENTS:

To bring in more integration among the specialities and allied fields, each department shall workout a programme to rotate the trainees in related disciplines.

Dissertation – Submission of Protocol, Continuous Evaluation of Dissertation, Submission of completed Dissertation

Every candidate appearing for the post-graduate degree examination shall at least six months prior to the examinations, submit with his form for examination, four typewritten copies of the dissertation undertaken by the candidate, prepared under the direction and guidance of his/her guide.

It must be approved by the Institutional Review Board consisting of Principal, all the HOD's, an advocate, medical specialties and social worker within the first six months after the commencement of the course. The application for registration of dissertation topic must be sent through the Principal duly forwarded by the Professor/ HOD. The University will register such dissertation topic. In case the students want to change the topic of dissertation, they can do it within the next three months. No change in the Guide/dissertation topic shall be made without prior approval of the University.

The aim of dissertation is to train a postgraduate student in research methodology. It includes identification of a problem with recent advances, designing of research study on collection of data, practical analysis and comparison of results and drawing conclusions.

The dissertation should be written under the following headings.

Introduction /Aims and objective/Review and literature/Materials & Methods/Results/Discussion

Conclusion/Summary

The written text of dissertation shall not be less than 100pages. It should be neatly typed in double line spacing on one side (A4 size, 8. 27”x 11.69”) and bounded properly. Photos, charts, tables, tables and graphs can be attached where ever necessary. Spiral binding should not be used. The dissertation shall be certified by the Guide and Head of the department and forwarded by the Principal to the University.

The dissertation so submitted shall be referred to the examiners for their examination and acceptance of it shall be a condition precedent to allow the candidate to appear for the written part of the examination.

Provided that a candidate whose dissertation has been accepted by the examiner, but declared failed at the examination, shall be permitted to re-appear at the subsequent examination without a new dissertation.

Provided further that if the dissertation is rejected by the examiner, the examiner shall assign reasons thereof with suggestions for its improvement to the candidate and such candidate shall re-submit his/ her dissertation to the examiner who shall accept it before appearing in the examination.

Schemes of Examination:

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

Written examination shall consist of Basic Sciences Paper (Part-I) of three hours duration and should be conducted at the end of First year of MDS course. Part-II Examination will be conducted at the end of Third year of MDS course. Part-II Examination will consist of Paper-I, Paper-II & Paper-III, each of three hours duration. Paper-I & Paper-II shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Paper-III will be on Essays. In Paper-III three Questions will be given and student has to answer any two questions. Each question carries 50 marks. Questions on recent advances may be asked in any or all the papers. Distribution of topics for each paper will be as follows: *

PART-I : Applied Basic Sciences: Applied Basic Sciences: Applied Anatomy, Physiology & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics

PART-II :

- Paper-I** : Oral and Maxillofacial Radiology
Paper-II : Oral Medicine, therapeutics and laboratory investigations
Paper-III : Essays (descriptive and analyzing type questions)

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

B. Practical / Clinical Examination

: 200 Marks

1st Day

Clinical Case Presentation

2 Spotters	2 x 10 = 20 Marks
2 Short Cases	2 x 15 = 30 Marks
1 Long Case	1 x 50 = 50 Marks
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	Total = 100 Marks

Radiology Exercise

- I. A) One Intra Oral Radiograph : 10 Marks
B) One Occlusal Radiograph :30 Marks
- II. A) Two Extra Oral Radiograph :2 x 30 = 60 Marks
Including technique and interpretation

2nd Day

C. Viva Voce

: 100 Marks

i. Viva-Voce examination

: 80 marks

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

ii. Pedagogy Exercise

: 20 marks

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

REFERENCE BOOKS

Recommended list of Textbooks

1. Burket's Oral Medicine 12th Edition
2. Differential Diagnosis of Oral and Maxillofacial Lesions, 5e.(Norman K Wood , Paul W Goaz)
3. Oral Radiology Principles and Interpretation: First South Asia Edition
4. Essentials of Dental Radiography and Radiology, 4e. by Eric Whaites
5. Oral and Maxillofacial Pathology: First South Asia Edition by Neville
6. Shafer's Textbook of Oral Pathology - 8th Edition

7. BD Chaurasia's Human Anatomy
8. K Sembulingam essentials of medical physiology
9. Panicker : TB of Microbiology
10. Textbook Of Biochemistry For Medical Students by Vasudevan
11. Essentials of Medical Pharmacology 7th Edition by KD Tripathi
12. R.S.Satoskar : Pharmacology & Pharmacotherapeutics 14/E Vol : I
13. R.S.Satoskar : Pharmacology & Pharmacotherapeutics 14/E Vol : II

Recommended list of Reference books

1. Textbook of Oral Medicine - S. R. Prabhu
2. Hutcinson's Clinical Methods
3. Symptoms And Signs Of Clinical Medicine- Chambertain
4. The Problems And Practice Of Medicine - Davidson S
5. Medicine For Dental Students - Lucas
6. Radiology Of The Teeth And Jaws Including Dental Radiology- Ingram F L-
7. A Manual Of Dental And Oral Radiography- Blackman And Peyton
8. Principle And Practice Of X-Ray- Musterman
9. Oral Roentgenographic Diagnosis- Stafne E C S
10. Advanced Radiodontia Treatment - Simpson
11. Dental Roentgenology- Ennis L M
12. Goodman & Gilman The Pharmacological Basis of Therapeutics 9 / E
13. CA of cone beam volumetric imaging for dental applications - Miles
14. Oral Roentgenographic Diagnosis - Stafne E C S
15. Dental Radiology - Wuchmiann And Manson
16. Panoramic Radiology by by Langland, Olaf E., Langlais
17. Principles and Practice of Panoramic Radiology by Olaf E. Langland, Robert P. Langlais
18. Principles and Practice of Oral Radiologic Interpretation: H.M. Worth
19. Management of Temporomandibular Disorders and Occlusion by Jeffrey P. Okeson
20. Bell's Orofacial Pains: The Clinical Management of Orofacial Pain by Jeffrey P. Okeson
21. Head and Neck Surgery and Oncology, 4th edition- Jatin Shah
22. Manual of Forensic Odontology, Fifth Edition by David R. Senn, Richard A. Weems
23. Little and Falace's Dental Management in the Medically Compromised Patient
24. Oral Diseases: Textbook and Atlas by Torello Lotti, Lawrence C. Parish, Roy S.III
- Rogers
25. Textbook of Geriatric Dentistry by Poul Holm-Pedersen, Angus W. G. Walls, Jonathan A. Ship

JOURNALS

Recommended list of National Journals

1. Journal of Indian academy of Oral Medicine and Radiology (JIAOMR)
2. Contemporary Clinical Dentistry (CCD)
3. Indian Journal of Dental Research (IJDR)
4. Indian journal of radiology and imaging(IJRI)
5. Indian Journal of Medical Research (IJMR)
6. Indian Journal of Palliative Care
7. Indian Journal of Cancer
8. HIV Medicine
9. Journal of Forensic Dental Sciences
10. Indian Journal of Forensic Odontology
11. Availability of the Tamil Nadu Dr. M.G.R. Medical University, Chennai TNMGRMU e-Consortium
12. Tamil Nadu Dr. M.G.R. Medical University E Journal

Recommended list of International Journals

1. Journal of Oral Pathology & Medicine
2. Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology (OORR)
3. Dentomaxillofacial Radiology (DMFR)
4. Oral Oncology
5. Journal of Oral & Facial Pain and Headache
6. Oral Diseases
7. Journal of Investigative and Clinical Dentistry
8. Journal of Evidence-Based Dental Practice
9. Journal of Dental Research
10. Radiology Case Reports