

**Pravara Institute of Medical Sciences
(Deemed University)**

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**Syllabus
M.D.S. (Oral Medicine & Radiology)**

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9. ORAL MEDICINE & 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 finaximo faid region, diagnostic procedures pertaining to them and latest information of imaging modules.

SKILLS AND ATTITUDE:

Three important skills need to be impart and maxillo-facial diseases

1. Diagnostic skill in recognition of oral 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:

Paper I : 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 :

- Hormones - classification and mechanism of action
- Hypothalamic and pituitary hormones
- Thyroid hormones
- Parathyroid hormones and calcium homeostasis
- Pancreatic hormones
- Adrenal hormones

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

PHAMACOLOGY:

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

PAPER – II : 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

PAPER – III: 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 tissues 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 – clinical pharmacology
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

PROCEDURAL AND OPERATIVE SKILLS:

1st Year :

1. Examination of Patient
 - Case history recordings - 100
 - FNAC - 50
 - Biopsy - 50
 - Observe, Assist, & Perform under supervision
2. Intra – oral radiographs :
 - Perform an interpretation - 500

2nd Year:

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

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 in Section IV.

SCHEME OF EXAMINATION :

A. Theory

Written examination shall consist of four questions papers each of three hours duration. Total marks for each paper will be 100. Paper I, II and III shall consist of two long questions carrying 20 marks each and 6 short essay questions each carrying 10 marks. 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 - I :** Applied Basic Sciences : Applied Anatomy, Physiology, Biochemistry, Pathology, and Pharmacology
PAPER - II : Oral and Maxillofacial Radiology
PAPER – III : Oral Medicine, therapeutics and laboratory investigations
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 / 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 2 x 50 = 50 Marks

Total = 100 Marks

Radiology Exercise

I. A) One Intra Oral Radiograph : 100 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 candidates in the beginning of clinical examination. He/ She is asked to make presentation on the topic for 8 – 10 minutes.

SECTION – VI

ETHICS IN DENTISTRY

INTRODUCTION :

There is a definite shift nsow from the traditional patient and doctor relationship and delivery of dental care. With the advances in science and technology and the increasing needs of the patient, theirs families and community, there is a concern for the health of the community as a whole. There is a shift to greater accountability to the society. Dental specialists like the other health professional are confronted with many ethical problems. It is therefore absolutely necessary for each and every one in the health care delivery to prepare themselves to deal with these problems. To accomplish this and develop human values. It is desired that all the trainees undergo ethical sensitization by lectures or discussion on ethical issues, discussion cases with an important ethical component.

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.
- Declaration of Helsinki, WHO declaration Geneva, International code of ethics, D.C.I. Code of ethics.

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
Working out criteria towards decisions

RECOMMENDED READING:

1. Francis C. M., Medical Ethics, 2nd Edn, 2004' Jaypee Brothers, New Delhi.
2. Ethical Guidelines for Biomedical Research on Human subjects, Indian Council of Medical Research, New Delhi, 2000.