



AMRITA
VISHWA VIDYAPEETHAM

School of
Dentistry

MASTER OF DENTAL SURGERY (MDS)- Oral Medicine & Radiology (MDS.OMR)

(As per the Regulations of Dental Council of India)



Our Inspiration



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PROGRAM OUTCOMES

The program outcomes of MDS Oral Medicine & Radiology may be summarized as appended below. At the end of three years of training, a post graduate student in Oral Medicine & Radiology is expected to:

- Acquire theoretical, Clinical and practical knowledge of all oral mucosal lesions, skeletal involvement
- Obtain expertise in identifying pathological conditions in the facial region, diagnostic procedures pertaining to them
- Knowledge and expertise in imaging techniques for diagnosis of various lesions as well as latest information of imaging modalities.

PROGRAM SPECIFIC OUTCOMES

A candidate undergoing training for the MDS program in Oral Medicine & Radiology, shall, at the end of the three year training, inculcate the following specific skills:

- Diagnostic skills in the recognition of oral diseases with radiographic diagnosis and their management.
- Research skills in handling scientific problems pertaining to oral diseases and their treatment.
- Clinical and Didactic skills in encouraging young students to attain learning objective.

EVALUATION AND GRADING SYSTEM

SCHEME OF EXAMINATIONS

PART I MDS EXAMINATIONS

The DCI, in its revised curriculum, has introduced a University level Examination at the end of the First year of the MDS course, from 2018-2019. As per this curriculum, “the University shall conduct the Part I MDS Examination in Applied Basic Sciences at the end of the first academic year. This shall consist of One Theory Written Paper of three hours duration, and

shall contain ten questions, each carrying ten marks each. The answer sheets shall be valued by one External Examiner and one Internal Examiner from the concerned specialty” .

1. At the end of the 1st academic year (on completion of 12 months after the start of the MDS course), the University shall conduct the Part I MDS Examinations in Applied Basic Sciences, notification for which shall be issued by the Examination Control Division (ECD) of the University two months prior to the date of conduct of these Examinations.
2. As part of the **eligibility criteria** to appear for the Part I MDS Examinations, each MDS student shall have secured a **minimum of 80% attendance** in the first year of the MDS course, and shall have completed all the Pre-clinical work/exercises or any such course work, as mandated by the DCI, in its Modified Regulations (2017) or by the Head of the concerned Department /Principal of the Institution. The Principal shall send a list of students eligible to appear for the Part I MDS Examinations, to the ECD, at least 2 weeks prior to the start of the Examinations, so as to enable the University to issue hall tickets to eligible candidates
3. The Part I MDS Examinations in **Applied Basic Sciences** shall consist of *one (1) Theory Written Paper*, of three (3) hours durations, for a total of one hundred (100) marks. The Theory Written paper shall have a total of ten (10) questions, each carrying 10 marks. The single paper carrying a total of 100 marks, can comprise varied types of questions that could help assess the knowledge of the candidates in a better manner.
4. A grand viva voce on the topics covered for the Theory Examinations can be conducted by the External and Internal Examiners appointed by the University for paper Evaluation. This will impart a better value and credibility to the Part I Examination system. The Viva voce can be conducted in the respective Departments of the Dental School, on the same day as notified by the University for evaluation of the Theory answer sheets.
5. The University can appoint as Question paper setters for the Part I MDS examinations, those Examiners from the concerned specialty, who fulfill the same general criteria laid down by the DCI, to qualify as Examiners for the Part II MDS Examinations. The Examiners may take care

to set the questions which apply to the Basic Science topics in their concerned specialty, as mandated in the syllabus for the same by the DCI.

6. The candidates need to secure 50% marks separately for theory written and Grand viva to be declared '**Passed**' for the Part I MDS Exams. **Candidates who have failed in the Part I MDS Examination**, will have a chance to appear for the supplementary Examinations that shall be conducted by the University six months after the conduct of the Regular Examinations. To become eligible to appear for the Part II MDS Examinations at the end of the third year of the course, the candidate shall have passed the Part I Examinations at least 6 months prior to the Part II Examinations. There shall be *NO revaluation of the answer sheets* of the Part I MDS Examinations.
7. **The syllabus for the Part I MDS Examinations** shall be according to that specified by the DCI for each Specialty in its MDS Course Regulations, 2017.

Part II MDS Examinations:

1. Shall be conducted at the end of three years of completion of the MDS course. Notification for these Examinations shall be given by the ECD three months prior to the actual dates of the Examinations.
2. Every MDS student shall submit to the University (ECD) four printed copies of the completed **Dissertation work** duly signed and approved by the Guide/HOD, through the Principal, six months prior to the scheduled date of Examinations. *Acceptance of Dissertation by all the appointed Examiners is a mandatory pre-requisite to enable the candidate to become eligible to appear for the subsequent Part II MDS Examinations.*
3. Hall tickets shall be issued to the candidates for the Part II MDS Examinations, based on: (a) Acceptance of Dissertations by the appointed Examiners, (b) Report of eligibility of candidates from the Principal, after taking into account the completion of the required

quantum of work in each specialty and (c) a minimum of 80% total attendance for each candidate.

4. There shall be *three (3) Theory Written Papers, followed by the Practicals and Viva-voce.*
5. Each **Theory Written Paper** (Paper I, II & III) will have the syllabus and contents, as prescribed in the MDS Course Regulations, for each specialty. The nomenclature of each paper for each specialty will also be in accordance with these Regulations. Each paper shall be of three hours durations, and maximum marks of One hundred (100). For Papers I and II, there shall be two essay questions, each carrying twenty five (25) marks, and five (5) short questions, each carrying ten (10) marks. For Paper III, there shall be Three (3) Essay questions of which the candidates need to answer any two (2), carrying 50 marks each. Each paper shall be of 3 hours duration.

PAPER I : Oral and Maxillofacial Radiology

PAPER II : Oral Medicine , therapeutics and laboratory investigations

PAPER III : 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 over lapping 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 2x10=20 Marks

2 short cases 2x15=30 Marks

1 long case 1x50=50 Marks

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 :2x30= 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 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.

MARKS DISTRIBUTION

Part I Applied Basic Sciences Examination	Maximum Marks	Marks required for Pass
Theory Written Exam	100	50 out of 100
Grand Viva	50	25 out of 50
Part II Examinations		
Theory Written Exams (3 papers)	300 (100 marks each)	150
Practical and Viva-voce	300 (200 for Practicals, 80 for Grand Viva, 20 for Pedagogy)	150
Total for Part II Exams	600 (300 + 300)	300

COURSE DETAILS

SI#	COURSE NAME	COURSE CODE
1	Applied Basic Sciences	MOMR1
2	Oral and Maxillofacial Radiology	MOMR2
3	Oral Medicine, Therapeutics and Laboratory Investigations	MOMR3
4	Recent Advances	MOMR4

Applied Basic Sciences (MOMR1)

COURSE OUTCOMES

CO1	Acquire knowledge about the basic structures of head and neck
CO2	Knowledge of the regional anatomy, histology, embryology and osteology of head and neck with general disposition of thorax, abdominal and pelvic organs and translating this knowledge in diagnostic practice

Oral and Maxillofacial Radiology (MOMR2)

CO1	Gain knowledge and expertise in basics of imaging and radiology
CO2	Acquire skill in imaging modalities for various oro-facial diseases
CO3	Expertise to interpret radiographs and images pertaining to head and neck imageology

Oral Medicine, Therapeutics and Laboratory Investigations (MOMR3)

CO1	Acquire knowledge in clinical and oral manifestations of various
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	diseases affecting the head and neck region
CO2	Expertise to diagnose various pathologies affecting the head and neck region by proper identification of clinical features as well as ordering the proper investigative procedures to strengthen the diagnosis.

COURSE SYLLABUS

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
 - Thyroid
 - Parathyroid
 Exocrine glands

- Parotid
- Thyroid
- Parathyroid

J Sympathetic chain

K 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

Nasal septum

a. Lateral wall of nasal cavity

b. Para nasal 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

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, Para nasal 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 the face must be dealt in detail.

HISTOLOGY:

1 Study of epithelium of oral cavity and the respiratory tract

2 Connective tissue

- 3 Muscular tissues
- 4 Nervous tissue
- 5 Blood vessels
- 6 Cartilages
- 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 change
- 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 SYSTEMS:

- 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/ nonessential
- 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
- Inborn errors of amine acid metabolism
- Methionine and transmethylation

4 Nucleic Acid

- 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 NSAID in inflammation
- Cellular changes in radiation injury and its manifestations

2 Homeostasis:

- Role of Endothelium in thrombo – genesis
- Arterial and venous thrombi
- Disseminated Intravascular Coagulation

3 Shock:

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

4 Chromosomal Abnormalities:

- Marfan's syndrome
- Ehler's Danlos Syndrome
- Fragile X Syndrome

5 Hypersensitivity:

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

6 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

7 Others:

- Sex linked agammaglobulinemia
- 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 hypersensitivity 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 –rays, property of
X-rays 2 hours
- 2 Biological effects of radiation 2 hours
- 3 Filtration, collimation, grids and units of radiation 1 hour
- 4 Films and recording media 2 hours

- 5 Processing of image in radiology 2 hours
- 6 Design of x- ray department, dark room and use of automatic processing units 1 hour
- 7 Localization by radiographic techniques 1 hour
- 8 Faults of dental radiographs and concept of ideal radiograph 1 hour
- 9 Quality assurance and audit in dental radiology 2 hours
- 10 Extra-oral imaging techniques 2 hours
- 11 OPG and other radiologic techniques 2 hours
- 12 Advanced imaging technique like CT scan, MRI, Ultrasound & thermographic 2 hours
- 13 Radio nucleotide techniques 2 hours
- 14 Contrast radiography in salivary gland, TMJ, and other radiolucent pathologies 2 hours
- 15 Radiation protection and ICRP guidelines 2 hours
- 16 Art of radiographic report, writing and descriptors preferred in reports 2 hours
- 17 Radiographic differential diagnosis of radiolucent, radio opaque and mixed lesions 2 hours
- 18 Digital radiology and its various types of advantages 2 hours

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 tissue including modern diagnostic techniques 3 hours
- 2 Laboratory investigations including special investigations of oral and oro-facial diseases 4 hours
- 3 Teeth in local and systemic diseases, congenital, and hereditary disorders 2 hours
- 4 Oral manifestations of systemic diseases 5 hours
- 5 Oro- facial pain 4 hours
- 6 Psychosomatic aspects of oral diseases 4 hours
- 7 Management of medically compromised patients including medical emergencies in the dental chair 5 hours
- 8 Congenital and Hereditary disorders involving tissues of oro-facial region 4 hours
- 9 Systemic diseases due to oral foci of infection 5 hours

- 10** Hematological, Dermatological , Metabolic, Nutritional, & Endocrinal conditions with oral manifestations 5 hours
- 11** Neuromuscular diseases affecting oro- facial region 4 hours
- 12** Salivary gland disorders 3 hours
- 13** Tongue in oral and systemic diseases 3 hours
- 14** TMJ dysfunction and diseases 3 hours
- 15** Concept of immunity as related to oro- facial lesions, including AIDS 3 hours
- 16** Cysts. Neoplasms, odontomes, and fibro- osseous lesions 4 hours
- 17** Oral changes in osteo- dystrophies and chondro- dystrophies 4 hours
- 18** Pre-malignant and malignant lesions of oro-facial region 4 hours
- 19** Allergy and other miscellaneous conditions 3 hours
- 20** Therapeutics in oral medicine – clinical pharmacology 5 hours
- 21** Forensic odontology 8 hours
- 22** Computers in oral diagnosis and imaging 3 hours
- 23** Evidence based oral care in treatment planning 3 hours
- 24** Molecular Biology 8 hours

ESSENTIAL KNOWLEDGE:

- Basic medical subjects, Oral Medicine. Clinical Dentistry and Management of Medical Emergencies.
- Oral Radiology, Techniques and Inter- Operation, Diagnosis of Oro-facial Disorders

PROCEDURAL AND OPERATIVE SKILLS:

I Year

- 1** Examination of patient - Case history recording -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

Observe, assist, perform and Interpret CBCT = 100 nos.

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

Observe, assist, perform and Interpret CBCT = 100 nos.