PACIFIC DENTAL COLLEGE & HOSPITAL, DEBARI , UDAIPUR

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

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

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

CO1	Acquire knowledge in clinical and oral manifestations of various
	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.

SYLLABUS

I.ORAL MEDICINE:

1. A) Case history, clinical examination, investigations and Diagnosis & treatment planning.
   B) Laboratory procedures including special investigations.

   C) Biopsy procedures.

2. Clinical pathology & microbiology as applied to orofacial lesions.
3. Classification, Diagnosis & medical management of diseases of oral mucosa & Jaws.
4. Fusospirochaetal infections.
5. Ulcerative, vesicular and bullous lesions of oral mucosa.
6. Red and white lesions of oral cavity.

7. Pigmentations of oral tissues.
8. Gingival enlargements.
9. Diseases of tongue.
10. Granulomatous diseases.
11. Sexually transmitted diseases.
12. Diseases of salivary glands.
13. TMJ disorders including MPDS (Myofacial pain dysfunction syndrome)
14. Diseases of Para nasal air sinuses.
15. Orofacial pain.
16. Acute and chronic infections of orofacial region.
17. Developmental disorders in the orofacial region.
18. Cysts, odontomes, premalignant lesions and neoplasms of oral & maxillofacial region
19. Systemic disorders with possible oral manifestations:
    a) Gastrointestinal system
    b) Respiratory system
    c) Cardio-vascular system
    d) Uro-genital system
    e) Nervous system
    f) Reticulo-endothelial system
20. Dental management of medically compromised patients.
21. Hematological disorders.
22. Bleeding and clotting disorders.
23. Endocrine and metabolic disorders with orofacial manifestations.
24. Immunologic diseases (congenital & acquired)
25. Basic knowledge of drugs used in orofacial diseases.
26. Cross infection control in dentistry.
27. Maxillofacial trauma, examination, investigation and diagnosis.
28. Trismus
29. Halitosis.
30. Syndromes of head & neck.
31. Forensic odontology.

II. MAXILLOFACIAL RADIOLOGY:

1. History of Radiology.
2. Radiation Physics
3. Radiation Biology (Hazards & protection)
4. Ideal radiograph-Principles & factors.
5. X-ray films &processing of x-ray films (Darkroom chemistry)
6. Radiographic technique (Intraoral & extra oral)
7. Radiographic anatomy (Maxillofacial)
8. Principles & practice of radiographic interpretation of lesions in maxillofacial area namely:

    a) Developmental anomalies of teeth & jaws.
    b) Trauma.
    c) Dental caries
    d) Periodontal diseases
    e) Periapical lesions
    f) Infections including osteomyelitis.

g) Cysts & odontomes.
h) Benign & malignant tumors.
i) Fibro-osseous diseases & diseases of unknown etiology.

9. Applied radiology such as –
   a) Radiology in Endodontics.
   b) Implant Radiology.
   c) TMJ Radiology.
   d) Maxillary sinus Radiology
   e) **Basics of 3 D printing**
10. Advances in Imaging modalities
    Viz- OPG, CT scan, MRI, Radio nucleotide scanning, Xeroradiography, Digital Radiography, Ultrasonography etc.
11. Radiotherapy of head & neck region-
    Basic principles, dental evaluation, selection of cases, procedures, complications & Management.

Syllabus for Applied Basic Sciences

Applied Anatomy
Gross Anatomy of the face
Muscles of facial expression and muscles of mastication
Facial artery Facial nerve Facial vein
Parotid gland and its relations Neck region
Triangles of the neck with special reference to Carotid, Digastric triangles and midline structures.
Facial spaces
Carotid system of arteries, Vertebral artery, and Subclavian artery Jugular system- internal jugular & external jugular
Lymphatic drainage Cervical plane
Muscles derived from pharyngeal arches Infratemporal fossa in detail and TMJ
Endocrine glands- pituitary, thyroid, parathyroid Sympathetic chain
Cranial nerves- V, VII, IX, XI, XII Exocrine glands- salivary glands
Oral cavity proper and vestibule Tongue and teeth
Palate- soft and hard Nasal cavity
Nasal septum Lateral wall of nasal cavity Paranasal air sinuses Pharynx

In addition, gross salient features of brain and spinal cord with references to attachment of cranial nerves to the brain stem, detailed study of cranial nerve nuclei of V, VII, IX, X, XI, XII.
Osteology: Comparative study of fetal and adult skull

Mandible: Ossification, Age changes and evaluation of mandible in detail

Embryology
Development of face, palate, nasal septum, and nasal cavity, paranasal air sinuses. Pharyngeal apparatus in detail including floor of primitive pharynx.
Development of tooth in detail and age changes Development of salivary glands
Congenital anomalies of face must be dealt in detail.

Histology

Study of epithelium of oral cavity and respiratory tract
Connective tissue
Muscular tissue
Nervous tissue
Blood vessels
Cartilage
Bone and tooth
Tongue
Salivary glands
Tonsil, thymus, lymph nodes

Physiology
General physiology Cell
Body fluid compartments Cellular transport
Action potential
Muscle and nerve physiology
Structure of a neuron and properties of nerve fibres Structure of muscle fibres and properties of muscle fibres Neuromuscular transmission
Mechanism of muscle contraction Hematology
RBC and Hb
WBC- structure and functions
Platelets – functions and applied aspects Plasma proteins
Blood coagulation with applied aspects Blood groups
Lymph and applied aspects Respiratory system
Air passages, composition of air, mechanics of respiration with pressure and volume changes
Lung volumes and capacities and applied aspects
Oxygen and CO_2 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
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 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 Protein
Amino acids- essential/ nonessential, complete/ incomplete proteins Transamination/ Deamination (Definition with examples)
Urea cycle
Tyrosine- Hormones synthesized from tyrosine Inborn errors of amino acid metabolism Methionine and transmethylation
Nucleic acids Purines/ Pyrimidines
Purine analogs in medicine DNA/ RNA- Outline in structure Transcription/ translation Steps of protein synthesis Inhibitors of protein synthesis Regulation of gene function

Minerals
Calcium & phosphorous metabolism specifically regulation of serum calcium levels Iron metabolism
Trace elements in nutrition
Energy metabolism
Basal metabolic rate
Specific dynamic action (SDA) of foods Vitamins
Role in metabolism of Vit A, B, C, D, Thiamin, Riboflavin, Niacin, Pyridoxine.

Pathology
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 change 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 erythematosus
Infection and infective granulomas
Neoplasia
Classification of tumors
Carcinogenesis and 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
Microbiology

1. Oral Microbiology-Classification & characteristics
2. General microbiology

Bacterial cell morphology
Bacterial growth &
metabolism Antibiotic
sensitivity tests Mechanism
of drug resistance
Sterilization
Infection control
Different staining and culture techniques

Pharmacology
Definition of terminologies used
Dosage and mode of administration of drugs
Action and fate of drugs in the body
Drugs acting on the CNS
Drug addiction, tolerance and hypersensitivity reactions
General and local anesthetics, hypnotics, analeptics and
tranquilizers Chemotherapeutics and antibiotics
Analgesics and antipyretics
Anti-tubercular and anti-syphilitic drugs
Antiseptics, sialogogues, and anti-sialogogues
Haematinics
Anti-diabetics
Vitamins A, B complex,
C,D,E,K Steroids

Oral and Maxillo-facial Radiology: study includes seminars/ lectures/ demonstrations

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 & thermo graphic 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.

3D PRINTING OF OROFACIAL BONE / CBCT ASSISTED SURGICAL GUIDE 3D PRINTING

Medically compromised patients- 5

- Medically compromised cases reporting to Dental OPD- Outline modifications for dental treatment,
- Precautions for dental treatment
- complete record of their medical complication with records.

Major clinical cases- 25, 15 at end of 2nd yr, 10 at end of 5th term

- Complete case history as per proforma provided
- Clinical photographs
- Radiographs with interpretation
- Study models, biopsy reports, histopathological reports

Seminar presentation -3+3+3 = 9, 3 per year, to be completed 4 months before final exam

- Power point presentation –on CD
- Word document printed
- Seminar presentation points marking record

Journal club presentation - 3+3+3=9, 3 per year, to be completed 4 months before final exam

- Power point presentation –on CD
- Word document printed
- Journal Club presentation points marking record

Special case presentation 3+3+3= 9, 3 per year, to be completed 4 months before final exam

- Power point presentation –on CD
- Word document printed
- Case presentation points marking record

Paper presentation-2, poster presentation-2, article publication-2

Library dissertation to be submitted before end of 3rd term, final thesis as per Instructions of student section

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III. Evaluation pattern of the department

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.

FORMATIVE EVALUATION PATTERN

MDS Part I	Once every three months	100 marks	3 hours
MDS Part II	Once every two months	100 marks	3 hours
MDS Part III	Once every month	100 marks	3 hours

Pre-clinical and clinical examination is conducted accordingly.

SUMMATIVE EVALUATION PATTERN:

Theory 400 marks

Written examination shall consist of four question papers each of three hours duration. Total marks for each paper will be 100. Paper-I, Paper-II and Paper-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.

400 Marks Theory Exam:

- Paper I: Applied Basic sciences (100 Marks)
- Paper II: Oral & Maxillofacial Radiology (100 Marks)
- Paper III: Oral Medicine, therapeutics and laboratory investigations. (100 Marks)
- Paper IV: Essay (100 Marks)

400 Marks Practical Exam:

- Radiological Evaluation: (160 Marks)
- Long Case (60 Marks)
- Short cases (2) (60 Marks)
- Spotters (2) (20 Marks)
- VIVA (80 Marks)
- Pedagogy (20 Marks)