



AMRITA
VISHWA VIDYAPEETHAM

School of
Dentistry

MASTER OF DENTAL SURGERY (MDS)- Oral Pathology & Microbiology (MDS.OPR)

(As per the Regulations of Dental Council of India)



Our Inspiration



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PROGRAM OUTCOMES

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

- To become specialists in this field who possess adequate knowledge, skills and attitude to identify and correlate the clinical, radiographic and histopathologic features of different pathologies of the Head and Neck region to arrive at a definitive diagnosis of that pathology.
- Gain high competence in both general and special pathology dealing with diseases of head and neck, their causes, mechanisms and effects.
- Have a good understanding of current research methodology, collection and interpretation of data, ability to carry out research projects on clinical and epidemiologic aspects and working knowledge of current data bases and automated data retrieval systems.
- Gain skill and practice in referencing and writing and publishing scientific papers of academic and clinical significance
- To gain skill and expertise which will make them excellent trainers for the undergraduate dental students.

PROGRAM SPECIFIC OUTCOMES

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

- Perform routine histopathologic evaluation of specimens relating to Head and Neck region and to give a clear and unbiased report of the nature of pathology based on the histopathologic evaluation of that specimen.

- Carry out routine diagnostic procedures in the laboratory including hematologic, cytologic, microbiologic, and immunologic investigations.
- Gain the skill and confidence to present scientific data pertaining to the specialty, in conferences both as oral presentations and as posters and/or to take part in group discussions on subject related topics.
- Acquire adequate knowledge of the medico-legal aspects of dental practice, gain experience to take part in mass disaster management programs, to give opinion as and when required in such conditions as a dental forensic expert.

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.

6. **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 Pathology, Oral microbiology, Oral immunology and Forensic Odontology

Paper II: Laboratory techniques in Oral Pathology & Microbiology

Paper III: Essay – Recent advances in Oral Pathology & Microbiology

A. PRACTICALS (200 marks)

The practical examinations shall be conducted at the end of the III year after the theory examinations and carry a total of 200 marks. The duration of the practical exams shall be 2 consecutive days. The scheme is as follows:

Day 1:

1. Presentation of Long case: 20 marks
2. Presentation of short case: 10 marks
3. Clinical Hematology (any two investigations from the basic hematologic tests to be performed from Hb, RBC count, WBC count, DC, ESR): 10 + 10=20 marks
4. Smear presentation (Cytology smear preparation and Pap staining): 15 marks
5. Microbial staining: Grams stain or acid fast stain to be performed on the given sample/smear: 10 marks
6. H & E staining of paraffin sections: 25 marks

Day 2

7. Histopathology slide discussion: 100 marks (10 slides)
(Each of the above procedures shall be accompanied by chair-side/clinical/spot viva voce)

B. GRAND VIVA: 80 marks (on Day 2 of the practical exams)

Viva voce shall be conducted along with the University practical exams at the end of the III year and shall involve the viva voce on the candidate by the panel of examiners on the candidate's knowledge of the topics, ability to comprehend, analyse and express the same, and communication skills.

C. THESIS PRESENTATION & PEDAGOGY: 20 marks (on Day 2 of the practical exams)

Shall involve a brief presentation of the main thesis by the candidate and a detailed discussion on the same with the panel of examiners (to be conducted along with the University practical examinations). This may be completed in not more than 15 minutes. A small lecture class by the candidate on a topic given by the Examiners on the previous day will also be conducted along with the Thesis presentation, as a Pedagogy exercise. This will help evaluate the teaching skills of the candidate.

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	MOPT1
2	Oral Pathology, Oral microbiology and Forensic Odontology	MOPT2
3	Laboratory techniques in Oral Pathology	MOPT3
4	Recent Advances	MOPT4

COURSE OUTCOMES

APPLIED BASIC SCIENCES (MOPT1)

CO1	Knowledge of anatomical terms in relation to various systems of the body
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 the specialty related diagnosis
CO3	Basic knowledge about medical genetics and emphasis on topics of dental importance.

ORAL PATHOLOGY, ORAL MICROBIOLOGY AND FORENSIC ODONTOLOGY
(MOPT2)

COURSE OUTCOMES

CO1	Knowledge and skill to identify and diagnose basic diseases and lesions affecting oral tissues through microscopic slides
CO2	Knowledge of manifestations of common diseases, their diagnosis by correlation of clinical and pathologic features, with respect to oral cavity
CO3	Knowledge of principles of certain basic aspects of forensic odontology

LABORATORY TECHNIQUES IN ORAL PATHOLOGY (MOPT3)

CO1	Shall have acquired crisp knowledge on the various lab procedures in oral pathology practice
CO2	Basic knowledge and skill of preparation of paraffin embedded sections of human biopsy tissue
CO3	Overview of the various immunohistochemical techniques and their applications in the diagnosis of oral lesions.

COURSE SYLLABUS

FIRST YEAR Study of Oral biology, Tooth Morphology, Hematology lab procedures-theory and clinical work, Preparation of ground sections of teeth, Carving of Permanent teeth in wax, postings in General Physiology, Microbiology and Biochemistry Laboratories, Oral Biology Seminar presentation, Departmental Journal Clubs, Selection of topics for Library dissertation and Main Thesis (after 6th month); sending synopsis of Main Thesis to the University (by the end of 1st year); commencement of Library dissertation.

SECOND YEAR Study of Oral Pathology, Oral Microbiology, Forensic Odontology and Laboratory techniques in Oral Pathology in detail; Slide discussions on Oral Pathology topics, Departmental Journal Clubs, Oral Pathology and Lab techniques Seminar presentation, Practice of tissue processing, microtomy, staining and slide preparation, postings in General Pathology, Forensic Medicine, Dermatology, Head & Neck Surgery and Oral Medicine; Commence and progress with Main thesis (change of topic of main thesis will be permitted once only, and if needed, it shall be done within the first 3 months of commencement of the 2nd academic year).

THIRD YEAR Completion of main thesis and submission to the University (3 months before the University exams), Seminars and journal clubs, Slide discussion and case presentations, Practice of hematological and microbiologic procedures for examination, Log book completion for submission during University practical examination; Completion of required quota of cases, slides and related practical work (at least 2

months before the university exams). University theory and Practical examinations with viva voce and Thesis discussion.

DETAILED COURSE CONTENT

1. ORAL BIOLOGY

Oral & Dental Histology

Structure and functions of oral soft and hard tissues: odontogenesis with histologic features of each stage, genetic control of same, detailed physical and chemical properties of dental hard tissues with microscopic features (light and ultrastructure) of enamel, dentin, cementum, alveolar bone, dental pulp, periodontal ligament, salivary glands, oral mucosa, mechanisms and histology of eruption and shedding. Special discussion about structural variations in oral mucosa in different parts of oral cavity, age-related changes of oral and dental tissues.

Embryology

Embryogenesis, germ layer formation, organogenesis, development of oral cavity, face, palate, tongue, maxilla and mandible; branchial arches and pharyngeal pouches and their derivatives.

Tooth morphology

Tooth numbering systems and nomenclature of dentition, arch traits and class traits, deciduous and permanent dentition – differences, chronology, measurements and detailed morphology of each aspect of central and lateral incisors, canines, premolars and first and second molars. Brief discussion about comparative anatomy of skull bones and

dentition of other animals. Carving of permanent teeth in natural size on wax blocks.

Applied Anatomy

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

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
 - ParathyroidExocrine glands
 - Parotid
 - Thyroid
 - Parathyroid
- J Sympathetic chain
- K Cranial nerves-V, VII, IX, XI, & XII

Oral Cavity:

- A Vestibule and oral cavity proper
- B Tongue and teeth
- C Palate- soft and hard

Nasal Cavity

- a. Nasal septum
- b. Lateral wall of nasal cavity
- c. Para nasal air sinuses

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

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

General Pathology

Cellular adaptation, degeneration, necrosis, apoptosis – mechanisms and pathology in detail; cell injury and adaptation, inflammation and repair – various mechanisms involved in, types, healing by primary and secondary intention, healing of extraction wound, factors influencing healing; Immune related and autoimmune diseases – mechanisms; neoplasia – definition, concept of benign and malignant neoplasms, metastasis and different modes, carcinogenesis – molecular mechanism, physical, chemical and biologic carcinogens (oncogenic viruses); RBC WBC and platelet disorders; bleeding and clotting defects.

Microbiology

Elementary knowledge of bacteria, viruses and fungi, culture media, sterilization and disinfection; immunity – types and mechanisms, vaccines, hypersensitivity reactions – types, mechanisms and examples, bacteriology and lab diagnosis of Streptococcus, Staphylococcus, Corynebacterium, Clostridia, Treponema, Mycobacterium, Actinomyces; Candida, virology of HIV, Herpes and Hepatitis.

Biostatistics and Research Methodology

Introduction to biostatistics, its applications in dentistry; collection, compilation and representation of statistical data, techniques of sampling, bias in sampling; mean, median and mode; Testing of hypothesis, standard error, t-test, Z-test, chi-square test, Analysis of variance, “U test”; Correlation and regression.

Applied aspects of Oral Biology including basics of molecular biology

- Applied aspects and clinical correlations of all dental and oral soft and hard tissues, with special emphasis on structural variations if any, age changes, clinical significance.
- Basic techniques in histology- methods in the study of enamel, dentin, cementum and alveolar bone, preparation of ground sections in detail, principle of decalcification.
- Principles of basic laboratory investigations in oral pathology: basic blood tests and their application in dental practice – RBC and WBC counts, HB estimation, ESR, DC and interpretation of results, Blood sugar estimation, Blood grouping.
- Microscopy: principles and optics of microscopes; types and functioning of microscopes.
- Basic research in the field of Oral biology; Genetics in tooth development, cloning and its scope in relation to Oral biology.

II. ORAL PATHOLOGY, ORAL ONCOLOGY, FORENSIC ODONTOLOGY, ORAL MICROBIOLOGY & IMMUNOLOGY, LABORATORY TECHNIQUES IN ORAL PATHOLOGY & RECENT ADVANCES

Oral Pathology & Oncology

- Developmental anomalies of oral and para-oral region, environmental defects affecting enamel & regressive changes of teeth
- Dental Caries – definition, old and current concepts of etiology, Mechanism and microbiology, various experimental studies in caries research, clinical, radiographic and histopathologic features of enamel and dentinal caries experiments conducted by Miller to study the caries process, molecular and biochemical changes taking place in dental caries, Role of dental plaque in caries etiology, Microbiology of dental plaque, Clinical, radiographic and histopathologic features of enamel and dentinal caries, caries

prevention and immunology, caries activity tests, fluorides and caries, caries vaccine and related experiments.

- Sequelae of Dental Caries: Sequelae of dental caries- Diseases of Pulp and periapical tissues, osteomyelitis, space infections and cellulitis, Focus of infection and focal infection.
- Cysts of oral region: Various classifications with emphasis on WHO classifications, clinical, radiographic, histopathologic features and biochemical studies of cystic fluids in various odontogenic and non-odontogenic cysts, recent concept of 'fissural cysts'
- Odontogenic tumors: Classifications of odontogenic tumors, clinical, radiographic and histopathologic features of various odontogenic tumors, recent concepts.
- Salivary Gland Pathology: Classification systems of salivary gland diseases, Neoplastic and non-neoplastic disorders of salivary gland, clinico-pathologic features, investigations in salivary gland disease, role of FNAC in diagnosis of salivary gland pathology.
- Dermato-pathology :Discussion of various dermatoses affecting the oral mucosa, their oral manifestations, histopathologic features; auto-immune dermatoses manifesting in the oral region with their immuno-pathogenesis clinico-pathologic features, role of immunofluorescence in their diagnosis. Special emphasis on Oral lichen planus and pemphigus.
- Gingival and Periodontal diseases Gingival and periodontal diseases: Classification, etiology for gingivitis and gingival enlargements, their differential diagnosis, etiology for periodontal diseases, plaque: concept, composition, microbiology and its significance in the pathogenesis of various periodontal diseases and dental caries, immunology of periodontal diseases, microbiology of gingival and periodontal diseases; role of gingival crevicular fluid in diagnosis of gingival and periodontal diseases.
- Bone pathology: Benign and malignant neoplasms of bone, Non-neoplastic diseases of bone, fibro-osseous lesions: concept, clinical,

radiographic and histopathologic features of various fibro-osseous diseases

- *Systemic diseases and their oral manifestations*: Role and effects of hormones, vitamins and minerals in oral health and diseases, hyper and hypo vitaminoses and their identifying features.
- Hematologic diseases: Diseases affecting RBCs, WBCs and platelets, their oral manifestations with special emphasis on anemias, leukemias and hemophilia, their hematologic pictures, dental implications in these diseases.
- Premalignant lesions and conditions of oral cavity: Concept of premalignancy from the old to the most recent, detailed study of leukoplakia, erythroplakia, oral submucous fibrosis, with special emphasis on 'epithelial dysplasia' – various grading systems of epithelial dysplasia, differential diagnosis for white and red lesions of the oral cavity.
- Non-odontogenic neoplasms of oral cavity: Various benign and malignant neoplasms of oral cavity arising from epithelium and various connective tissue structures, detailed discussion on oral squamous cell carcinoma-clinical and pathologic features, various grading systems available, factors affecting prognosis, clinical staging of oral cancer and melanomas, treatment modalities for oral cancer, immunology of oral cancer, molecular / genetic basis for oral cancer, connective tissue neoplasms with detailed study of lymphomas, their grading and staging, Oral tumor markers.
- Oral granulomatous diseases, Pigmented lesions of oral cavity, Giant cell lesions of the oral region, Hereditary defects of oral and paraoral structures, Round cell lesions and spindle cell lesions of the oral region

Oral Microbiology

- Normal oral microbial flora at different stages of life starting from birth
- Role of microbial flora in oral health and diseases
- Microbiology of dental caries, pulpal and periapical diseases
- Role of microorganisms in various oral infections – bacterial, viral and fungal with special emphasis on pathogenesis, oral manifestations, lab diagnosis and recent concepts of HIV, HSV, HPV, EBV, Candida, Strepto and Staphylococci, Actinomyces etc...
- Microbiology of gingival and periodontal diseases
- Demonstration of micro-organisms- stains used, their procedures – Gram and acid fast stain in detail. Various culture media used for diagnostic microbiology
- Asepsis: sterilization and disinfection in dental set up.

Forensic Odontology

- Scope and definition
- Importance of dentist in forensic field
- Post-mortem and ante-mortem examination and records
- Importance of maintaining patient records
- Mass disaster management and role of forensic dentist
- Forensic armamentarium
- Methods of age-estimation from skull and dental specimens
- Methods of sex-determination from skull and dental specimens
- Bitemarks: types, identification and analysis
- Rugae pattern and lip prints in forensic dentistry
- Medico-legal aspects in dental practice and management
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III. LABORATORY TECHNIQUES IN ORAL PATHOLOGY

- Biopsy techniques in oral pathology: indications and contr- indications, merits and demerits, cytology techniques with detailed

study of types of smears, FNAC and its indications and contra-indications and applications in diagnosis of oral diseases

- Routine histopathology: detailed study of specimen transfer to lab, grossing, fixation and fixatives, tissue processing, microtome and section cutting, staining techniques for routine histopathology, mounting of slides; common reagents and equipments used in each of the above processes-their functions, merits and demerits, artefacts that are likely to occur in each of the above stages of histo-preparations with measures to rectify them.
- Demonstration of special tissues and concept of special stains – PAP, PAS, Toluidine blue, PTAH, Alcian blue, Masson trichrome, Mallory stain, van Gieson; demonstration of carbohydrates, fat, amino acids, amyloid etc. in tissue sections
- Special stains: Pap stain, PAS in detail; special stains used for the demonstration of glycogen, carbohydrates, mucin, proteins, fat, amyloid, melanin etc.
- Immunohistochemistry and immunostaining: Concept, uses, various stains and reagents used; immunologic markers for epithelium, muscle, nerve, other connective tissue cells, odontogenic tumors Cell markers and proliferation indices used in oral cancer.
- Preparation of frozen sections and their uses in diagnostic pathology
- Light microscopy: concept and theories, the optics and functioning of a light microscope, various types of microscopes, their modifications and uses
- special microscopy methods in diagnostic oral pathology: fluorescent, polarizing, dark field, electron microscopy – techniques and uses; concept of immunofluorescence, types and applications in dermatopathology
- Basic DNA techniques: PCR, in-situ hybridization etc. and their application in Oral pathology
- Special investigative techniques: In-situ hybridization, PCR etc and their applications in diagnostic oral pathology

Recent Advances in Oral Pathology & Microbiology

- Advances in different fields of Oral Pathology & Microbiology, their implications and advantages if any. (For example: ‘Concept and current status of Caries vaccine’ in the field of dental caries.)

COURSE CONTENTS

ACADEMIC & CLINICAL WORK YEAR WISE

Year of Study	Academic activity	Clinical Activity
I MDS	<ul style="list-style-type: none">• Oral Biology seminars & discussions• Journal club Presentation• Histology undergraduate slides viewing and discussion• Tooth morphology carving exercises• Complete Library dissertation• Select topics for main thesis and send synopsis to university (by end of I year)• Lecture classes and slide discussions for undergraduate students in Oral Biology• Attending National/state conferences	<ul style="list-style-type: none">• Basic haematology tests – commence after first 3 months• Drawing of venous blood, Hb, RBC, WBC counts, ESR, DC, RBS• Postings in General Physiology, Microbiology & Biochemistry Clinical laboratories

II MDS	<ul style="list-style-type: none"> • Oral Pathology seminars and discussions • Lab techniques seminars and discussions • Oral Pathology UG slide review • Biopsy slides review from archives • Learning to format biopsy reports • Journal club presentations • Commence work on main thesis • Lecture classes & slide discussions for undergraduate students in Oral Pathology 	<ul style="list-style-type: none"> • Postings in Forensic medicine, General Pathology, Dermatology, Oral Medicine and Head & Neck Surgery departments • Case history taking of long and short clinical cases; Presentation and discussions of cases which are diagnostic challenges • Practical aspects of laboratory techniques • Microbial staining techniques
III MDS	<ul style="list-style-type: none"> • Continuing the academic activities in II year • Completion of main thesis (to be submitted to university 3 months before the final exams) • Completion of quota of seminars and journal clubs • Completion of academic log book for submission during university practical exams 	<ul style="list-style-type: none"> • All clinical activities and practical work of II year to be continued.

**DETAILS OF PRACTICAL, ACADEMIC AND CLINICAL WORK AND THE
MINIMUM QUOTA FOR EACH PG STUDENT IN ORAL PATHOLOGY &
MICROBIOLOGY**

Sl. No.	Exercise to be completed	Required quota
1	Seminars in Oral Biology	5
2.	Seminars in Oral Pathology	5
3.	Seminars in Lab techniques & miscellaneous topics	5
4.	Theory classes for BDS students in Oral Biology (in the first year)	5
5.	Theory classes for BDS students in Oral Pathology (in the second and third years)	5
6.	Slide classes/discussions for UG students (Oral biology in first year and Oral pathology in second and third years)	20
7.	Hematology cases (Blood sugar, RBC & WBC counts, Hb estimation, ESR, Interpretation and reporting of DCs)	75 cases of each category (to begin from the third month of joining)
8.	Postings in General Physiology, clinical laboratories of Microbiology and Biochemistry (in the first year)	15 days each
9.	Postings in Forensic medicine,	30 days each

	General Pathology and Dermatology (in the second year)	
10.	Postings in Head & Neck surgery / Oral Medicine (in the second year)	6 months each (minimum)
11.	Clinico-pathologic discussions – presentation of clinically challenging cases with their history, diagnosis, investigations and treatment plan	10 cases
12	Attending National Speciality conference	Compulsory for I & II year
13.	Paper presentations	5 (minimum)
14.	Publications in Indexed Journals	3 (minimum)
15.	Journal club presentations	Each PG student to present every alternate week i.e twice a month (to begin from the third month of joining the course)

Note: Each PG student shall maintain a log book indicating the nature of work/exercise done and shall obtain countersignature on the completion of each work from HOD/faculty-in-charge. At the end of the III year, the completed log book shall be attested by the HOD without which the candidate shall not be considered eligible to appear for the university examinations.