SCHEDULE – IX

(See regulation 24)

29. SYALLBUS FOR M.D.S. IN VARIOUS SPECIALTIES

The syllabus for MDS course includes both Applied Basic Sciences and subjects of concerned specialty. The syllabus in Applied Basic Sciences shall vary according to the particular specialty; similarly the candidates shall also acquire adequate knowledge in other subjects related to their respective specialty.

1. PROSTHODONTICS AND CROWN & BRIDGE

AIM:

To train the dental graduates so as to ensure higher level of competence in both general and specialty areas of Prosthodontics and prepare candidates with teaching, research and clinical abilities including prevention and after care in Prosthodontics – removable dental prosthodontics, fixed dental prosthodontics (Crown &Bridge), implantology, maxillofacial prosthodontics and esthetic dentistry.

GENERAL OBJECTIVES OF THE COURSE:

Training program for the dental graduates in Prosthetic dentistry– removable dental prosthodontics, fixed dental prosthodontics (Crown & Bridge), implantology, maxillofacial prosthodontics and esthetic dentistry and Crown & Bridge including Implantology is structured to achieve knowledge and skill in theoretical and clinical laboratory, attitude, communicative skills and ability to perform research with a good understanding of social, cultural, educational and environmental background of the society.

- To have adequate acquired knowledge and understanding of applied basic and systemic medical sciences, both in general and in particularly of head and neck region.
- The postgraduates should be able to provide Prosthodontic therapy for patients with competence and working knowledge with understanding of applied medical, behavioral and clinical science, that are beyond the treatment skills of the general BDS graduates and MDS graduates of other specialties,
- To demonstrate evaluative and judgment skills in making appropriate decisions regarding prevention, treatment, after care and referrals to deliver comprehensive care to patients.

KNOWLEDGE:

The candidate should possess knowledge of applied basic and systemic medical sciences.

- On human anatomy, embryology, histology, applied in general and particularly to head and neck, Physiology & Biochemistry, Pathology Microbiology & virology; health and diseases of various systems of the body (systemic) principles in surgery and medicine, pharmacology, nutrition, behavioral science, age changes, genetics, Immunology, Congenital defects & syndromes and Anthropology, Bioengineering, Bio-medical & Biological Principles
- The student shall acquire knowledge of various Dental Materials used in the specialty and be able to provide appropriate indication, understand the manipulation characteristics, compare with other materials available, be adept with recent advancements of the same.
- Students shall acquire knowledge and practice of history taking, Diagnosis, treatment planning, prognosis, record maintenance of oral, craniofacial and systemic region.
- Ability for comprehensive rehabilitation concept with pre prosthetic treatment plan including surgical re-evaluation and prosthodontic treatment planning, impressions, jaw relations, utility of face bows, articulators, selection and positioning of teeth, teeth

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arrangement for retention, stability, esthetics, phonation, psychological comfort, fit and insertion.

- Instructions for patients in after care and preventive Prosthodontics and management of failed restorations shall be possessed by the students.
- Understanding of all the applied aspects of achieving physical, psychological well-being of the patients for control of diseases and / or treatment related syndromes with the patient satisfaction and restoring function of Cranio mandibular system for a quality life of a patient.
- Ability to diagnose and plan treatment for patients requiring Prosthodontic therapy
- Ability to read and interpret radiographs, and other investigations for the purpose of diagnosis and treatment planning.
- The theoretical knowledge and clinical practice shall include principles involved for support, retention, stability, esthetics, phonation, mastication, occlusion, behavioral, psychological, preventive and social aspects of Prosthodontics science of Oral and Maxillofacial Prosthodontics and Implantology
- Tooth and tooth surface restorations, Complete denture Prosthodontics, removable partial denture Prosthodontics, fixed prosthodontics and maxillofacial and Craniofacial Prosthodontics, implants and implant supported Prosthodontics, T.M.J. and occlusion, craniofacial esthetics, and biomaterials, craniofacial disorders, problems of psychogenic origin.
- Should have knowledge of age changes, geriatric psychology, nutritional considerations and prosthodontic therapy in the aged population.
- Should have ability to diagnose failed restoration and provide prosthodontic therapy and after care.
- Should have essential knowledge on ethics, laws, and Jurisprudence and Forensic Odontology in Prosthodontics.
- Should know general health conditions and emergency as related to prosthodontics treatment like allergy of various materials and first line management of aspiration of prosthesis
- Should identify social, cultural, economic, environmental, educational and emotional determinants of the patient and consider them in planning the treatment.
- Should identify cases, which are outside the area of his specialty / competence, refer them to appropriate specialistsand perform interdisciplinary case management.
- To advice regarding case management involving surgical and interim treatment
- Should be competent in specialization of team management in craniofacial prosthesis design.
- To have adequate acquired knowledge, and understanding of applied basic, and systemic medical science knowledge in general and in particular to head and neck regions.
- Should attend continuing education programmes, seminars and conferences related to Prosthodontics, thus updating himself/herself.
- To teach and guide his/her team, colleagues and other students.
- Should be able to use information technology tools and carry out research both in basic and clinical areas, with the aim of publishing his/ her work and presenting his/her work at various scientific forums.
- Should have an essential knowledge of personal hygiene, infection control, prevention of cross infection and safe disposal of waste, keeping in view the risk of transmission of potential communicable and transmissible infections like Hepatitis and HIV.
- Should have an ability to plan and establish Prosthodontics clinic/hospital teaching department and practice management.
- Should have a sound knowledge (of the applications in pharmacology, effects of drugs on oral tissues and systems of body and in medically compromised patients.

SKILLS:

- The candidate should be able to examine the patients requiring Prosthodontic therapy, investigate the patient systemically, analyze the investigation results, radiographs, diagnose the ailment, plan the treatment, communicate it with the patient and execute it.

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- To understand the prevalence and prevention of diseases of craniomandibular system related to prosthetic dentistry.
- The candidate should be able to restore lost functions of stomatognathic system like mastication, speech, appearance and psychological comforts by understanding biological, biomedical, bioengineering principles and systemic conditions of the patients to provide quality health care in the craniofacial regions.
- The candidate should be able to demonstrate good interpersonal, communication skills ***and*** team approach in interdisciplinary care by interacting with other specialties including medical specialty for planned team management of patients for craniofacial **&** oral acquired and congenital defects, temporomandibular joint syndromes, esthetics, Implant supported Prosthetics and problems of Psychogenic origins.
- Should be able to demonstrate the clinical competence necessary to carry out appropriate treatment at higher level of knowledge, training and practice skills currently available in their specialty area with a patient centered approach.
- Should be able to interpret various radiographs like IOPA, OPG, CBCT and CT. Should and be able to plan and modify treatment plan based on radiographic findings
- Should be able to critically appraise articles published and understand various components of different types of articles and be able to gather the weight of evidence from the same
- To identify target diseases and create awareness amongst the population regarding Prosthodontic therapy.
- To perform Clinical and Laboratory procedures with a clear understanding of biomaterials, tissue conditions related to prosthesis and have required dexterity & skill for performing clinical and laboratory all procedures in fixed, removable, implant, maxillofacial, TMJ and esthetics Prosthodontics.
- To carry out necessary adjunctive procedures to prepare the patient before prosthesis like tissue preparation and preprosthetic surgery and to prepare the patient before prosthesis / prosthetic procedures
- To understand demographic distribution and target diseases of Cranio mandibular region related to Prosthodontics.

ATTITUDES:

- To adopt ethical principles in Prosthodontic practice, Professional honesty, credibility and integrity are to be fostered. Treatment to be delivered irrespective of social status, caste, creed or religion of patient.
- Should be willing to share the knowledge and clinical experience with professional colleagues.
- Should develop an attitude towards quality, excellence, ***non-compromising*** in treatment.
- Should be able to self-evaluate, reflect and improve on their own.
- Should pursue research in a goal to contribute significant, relevant and useful information, concept or methodology to the scientific fraternity.
- Should be able to demonstrate ***evidence-based*** practice while handling cases
- Should be willing to adopt new methods and techniques in prosthodontics from time to time based on scientific research, which are in patient's best interest.
- Should respect patient's rights and privileges, including patient's right to information and right to seek second opinion.

COMMUNICATIVE ABILITIES:

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- To develop communication skills, in particular ***and*** to explain treatment options available in the management.
- To provide leadership and get the best out of his / her group in a congenial working atmosphere.
- Should be able to communicate in simple understandable language with the patient and explain the principles of prosthodontics to the patient. He/She should be able to guide and counsel the patient with regard to various treatment modalities available.

- To develop the ability to communicate with professional colleagues through various media like Internet, e-mails, videoconferences etc. to render the best possible treatment. Should demonstrate good explanatory and demonstrating ability as a teacher in order to facilitate learning among students

COURSE CONTENTS:

The course content has been identified and categorized as essential knowledge given below.

ESSENTIAL KNOWLEDGE:

The topics to be considered are Applied Basic Sciences, Oral and Maxillofacial Prosthodontics and Implantology

APPLIED BASIC SCIENCES:

Should develop thorough knowledge on the applied aspects of Anatomy, Embryology, Histology particularly head and neck, Physiology, Biochemistry, Pathology, Microbiology, Virology, Pharmacology, Health and systematic diseases principles in surgery medicine and Anesthesia, Nutrition, Behavioral sciences, age changes, genetics, Dental Material Science, congenital defects and Syndromes and Anthropology, Biomaterial Sciences, Bio-engineering and Bio-medical and Research Methodology as related to Masters degree Prosthodontics and Crown & Bridge including Implantology

It is desirable to have adequate knowledge in Bio-statistics, Research Methodology and use of computers to develop necessary teaching skills in the specialty of Prosthodontics including crown and bridge.

APPLIED ANATOMY OF HEAD AND NECK:

General Human Anatomy –Gross Anatomy, anatomy of Head and Neck in detail:Cranial and facial bones, TMJ and function, muscles of mastication and facial expression, muscles of neck and back including muscles of deglutition and tongue, arterial supply and venous drainage of the head and neck, anatomy of the Para nasal sinuses in relation to the Vth cranial nerve. General considerations of the structure and function of the brain, brief considerations of V, VII, XI, XII, cranial nerves and autonomic nervous system of the head and neck. The salivary glands, Pharynx, Larynx Trachea, Oesophagus, Functional Anatomy of masticatory muscles, Deglutition, speech, respiration, and circulation, teeth eruption, morphology, occlusion and function. Anatomy of TMJ, its movements and myofacial pain dysfunction syndrome.

Embryology –Development of the face, tongue, jaws, TMJ, Paranasal sinuses,pharynx, larynx, trachea, esophagus, Salivary glands, Development of oral and Para oral tissues including detailed aspects of tooth formation.

Growth & Development –Facial form and Facial growth and development overview ofDentofacial growth process and physiology from foetal period to maturity and old age,. General physical growth, functional and anatomical aspects of the head, changes in craniofacial skeletal development, relationship between development of the dentition and facial growth.

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Dental Anatomy –Anatomy of primary and secondary dentition, concept of occlusion,mechanism of articulation, and masticatory function. Detailed structural and functional study of the oral and Para oral tissues, normal occlusion, development of occlusion in deciduous mixed and permanent dentitions, root length, root configuration & tooth-numbering systems.

Histology –histology of enamel, dentin, Cementum, periodontal ligament and alveolarbone, pulpal anatomy, histology and biological consideration. Salivary glands and Histology of epithelial tissues including glands.
Histology of general and specific connective tissue including bone, , Salivary glands, Histology of skin, oral mucosa, respiratory mucosa, connective tissue, bone, cartilage, cellular elements of blood vessels, blood, lymphatics, nerves, muscles, tongue and tooth

Cell biology –Brief study of the structure and function of the mammalian cell Components of the cell and functions of various types of cells and their consequences with tissue injury

APPLIED PHYSIOLOGY AND NUTRITION :

Introduction, Mastication, deglutition, digestion and assimilation, Homeostasis, fluid and electrolyte balance, blood composition, volume, function, blood groups and hemorrhage, Blood transfusion, circulation, Heart, Pulse, Blood pressure, capillary and lymphatic circulation. Shock, respiration, control, anoxia, hypoxia, asphyxia, artificial respiration. Endocrine glands in particular reference to pituitary, parathyroid and thyroid glands and sex hormones. Role of calcium and Vit D in growth and development of teeth, bone and jaws. Role of Vit. A, C and B complex in oral mucosal and periodontal health. Physiology and function of the masticatory system. Speech mechanism, mastication, swallowing and deglutition mechanism, salivary glands and Saliva

Endocrines – General principles of endocrine activity and disorders relating to pituitary, thyroid, pancreas, parathyroid, adrenals, gonads, including pregnancy and lactation. Physiology of saliva, urine formation, normal and abnormal constituents, Physiology of pain, Sympathetic and parasympathetic nervous system, neuromuscular co-ordination of the stomatognathic system.

Applied Nutrition – General principles, balanced diet, effect of dietary deficiencies and starvation, Diet, digestion, absorption, transportation and utilization & diet for elderly patients.

APPLIED BIOCHEMISTRY:

General principles governing the various biological activities of the body, such as osmotic pressure, electrolytic dissociation, oxidation-reductionCarbohydrates, proteins, liquids and their metabolism, Enzymes, Vitamins, and minerals, Hormones, Blood, Metabolism of inorganic elements, Detoxification in the body & anti metabolites.

APPLIED PHARMACOLOGY AND THERAPEUTICS:

Dosage and mode of administration of drugs. Action and fate of drugs in the body, Drug addiction, tolerance and hypersensitive reactions, Drugs acting on the central nervous system, general anesthetics hypnotics, analeptics and tranquilizers. Local anesthetics, Chemotherapeutics and antibiotics, Antitubercular and anti syphilitic drugs, Analgesics and antipyretics, Antiseptics, styptics, Sialogogues and antisialogogues, Haematinics, Cortisones, ACTH, insulin and other antidiabetics vitamins: A, D, B – complex group C, K etc. Chemotherapy and Radiotherapy. Drug regime for antibiotic prophylaxis and infectious endocarditis and drug therapy following dental surgical treatments like placement of implants, pre and peri prosthetic surgery

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APPLIED PATHOLOGY:

Inflammation, repair and degeneration, Necrosis and gangrene, Circulatory disturbances, Ischaemia, hyperaemia, chronic venous congestion, oedema, thrombosis, embolism and infarction. Infection and infective granulomas, Allergy and hypersensitive reactions, Neoplasms; Classification of tumors, Carcinogenesis, characteristics of benign and malignant tumors, spread of tumors. Applied histo pathology and clinical pathology.

APPLIED MICROBIOLOGY:

Immunity, knowledge of organisms commonly associated with diseases of the oral cavity (morphology cultural characteristics etc) of strepto, staphylo, , Clostridia group of organisms, Spirochaetes, organisms of tuberculosis, leprosy, diphtheria, actinomycosis and moniliasis etc. Virology, Cross infection control, sterilization and hospital waste management

APPLIED ORAL PATHOLOGY:

Developmental disturbances of oral and Para oral structures, Regressive changes of teeth, Bacterial, viral and mycotic infections of the oral cavity. Dental caries, diseases of pulp and periapical tissues, Physical and chemical injuries of the oral cavity, oral manifestations of metabolic and endocrine disturbances, Diseases of the blood and blood forming organism in relation to the oral cavity, Periodontal diseases, Diseases of the skin, nerves and muscles in relation to the Oral cavity.

LABORATORY DETERMINATIONS:

Blood groups, blood matching, R.B.C. and W.B.C. count, Bleeding and clotting time, PT, PTT and INR Smears and cultures – urine analysis and culture. Interpretation of RBS, Glycosylated Hb, GTT

BIOSTATISTICS:

Characteristics and limitations of statistics, planning of statistical experiments, sampling, collection, classification and presentation of data (Tables, graphs, pictograms etc) & Analysis of data, parametric and non parametric tests

Introduction to Biostatistics - Scope and need for statistical application to biological data. Definition of selected terms – scale of measurements related to statistics, Methods of collecting data, presentation of the statistical diagrams and graphs.
Frequency curves, mean, mode of median, Standard deviation and co-efficient of variation, Correlation – Co-efficient and its significance, Binominal distributions normal distribution and Poisson's distribution, Tests of significance.

RESEARCH METHODOLOGY:

Understanding and evaluating dental research, scientific method and the behavior of scientists, understanding to logic – inductive logic – analogy, models, authority, hypothesis and causation,. Measurement and Errors of measurement, presentation of results, Reliability, Sensitivity and specificity diagnosis tests and measurements, Research Strategies, Observation, Correlation, Experimentation and Experimental design. Logic of statistical in(ter)ferences, balance judgements, judgement under uncertainty, clinical vs., scientific judgement, problems with clinical judgement, forming scientific judgements, the problem of contradictory evidence, citation analysis as a Means of literature evaluation, influencing judgement :
Protocol writing for experimental, observational studies, survey including hypothesis, PICO statement, aim objectives, sample size justification, use of control/placebo, standardization techniques, bias and its elimination, blinding, evaluation, inclusion and exclusion criteria.

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APPLIED RADIOLOGY:

Introduction, radiation, background of radiation, sources, radiation biology, somatic damage, genetic damage, protection from primary and secondary radiation, Principles of X-ray production, Applied principles of radio therapy and after care.

ROENTGENOGRAPHIC TECHNIQUES:

Intra oral, extra oral roentgenography, Methods of localization digital radiology and ultra sounds. Normal anatomical landmarks of teeth and jaws in radiograms, temporomandibular joint radiograms, neck radiograms.
Use of CT and CBCT in prosthodontics

APPLIED MEDICINE:

Systemic diseases and (its) their influence on general health and oral and dental health. Medical emergencies like syncope, hyperventilation, angina, seizure, asthma and allergy/anaphylaxis in the dental offices – Prevention, preparation, medico legal consideration, unconsciousness, respiratory distress, altered consciousness, seizures, drug related emergencies, chest pain, cardiac arrest, premedication, prophylaxis and management of ambulatory patients, resuscitation, applied psychiatry, child, adult and senior citizens.

APPLIED SURGERY & ANESTHESIA:

General principles of surgery, wound healing, incision wound care, hospital care, control of hemorrhage, electrolyte balance. Common bandages, sutures, splints, shifting of critically ill patients, prophylactic therapy, bone surgeries, grafts, etc, surgical techniques, nursing assistance, anesthetic assistance.
Principles in speech therapy, surgical and radiological craniofacial oncology, applied surgical ENT and ophthalmology.

APPLIED PLASTIC SURGERY:

Applied understanding and assistance in programs of plastic surgery for prosthodontics therapy.

APPLIED DENTAL MATERIALS:

- Students should have understanding of all materials used for treatment of craniofacial disorders – Clinical, treatment, and laboratory materials, associated materials, technical considerations, shelf life, storage, manipulations, sterilization, and waste management.
- Students shall acquire knowledge of testing biological, mechanical and other physical properties of all materials used for the clinical and laboratory procedures in prosthodontic therapy.
    - Students shall acquire full knowledge and practice of Equipments, instruments, materials, and laboratory procedures at a higher level of competence with accepted methods.

All clinical practices shall involve personal and social obligation of cross infection control, sterilization and waste management.

ORAL AND MAXILLOFACIAL PROSTHODONTICS AND IMPLANTOLOGY:

I. NON-SURGICAL AND SURGICAL METHODS OF PROSTHODONTICS AND IMPLANTOLOGY

a. Prosthodontic treatment for completely edentulous patients – Complete dentures, immediate complete dentures, single complete dentures, tooth supported complete dentures & Implant supported Prosthesis for completely edentulous patients for typical and atypical cases

b. Prosthodontic treatment for partially edentulous patients: - Clasp-retained acrylic and cast partial dentures, transitional dentures, immediate dentures,

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intra coronal and extra coronal precision attachments retained partial dentures & maxillofacial prosthesis for typical and atypical cases

Prosthodontic treatment for edentulous patients: - Complete Dentures and Implant supported Prosthesis.

Complete Denture Prosthesis – Definitions, terminologies, G.P.T., Boucher's clinical dental terminology

Scope of Prosthodontics – The Cranio Mandibular system and its functions, the reasons for loss of teeth, consequences of loss of teeth and treatment modality with various restorations and replacements

a) **Edentulous Predicament**, Biomechanics of the edentulous state, Supportmechanism for the natural dentition and complete dentures, Biological considerations, Functional and Para functional considerations, Esthetic, behavioral and adaptive responses, Temporomandibular joints changes.

b) **Effects of aging of edentulous patients** –aging population, distribution andedentulism in old age, impact of age on edentulous mouth – Mucosa, Bone, saliva, jaw movements in old age, taste and smell, nutrition, aging, skin and teeth, concern for personal appearance in old age

c) **Sequelae caused by wearing complete denture** –the denture in the oralenvironment – Mucosal reactions, altered taste perception, burning mouth syndrome, gagging, residual ridge (reduction) resorption, denture stomatitis, flabby ridge, denture irritation hyperplasia, traumatic Ulcers, Oral cancer in denture wearers, nutritional deficiencies, masticatory ability and performance, nutritional status and masticatory functions.

d) **Temporomandibular disorders in edentulous patients** –Epidemiology,etiology and management, Pharmacotherapy, Physical modalities, and Bio-behavioral modalities

e) **Nutrition Care for the denture wearing patient** –Impact of dental status onfood intake, Gastrointestinal functions, nutritional needs and status of older adults, Calcium and bone health, vitamin and herbal supplementation, dietary counseling and risk factor for malnutrition in patients with dentures and when teeth are extracted.

f) **Preparing patient for complete denture patients** –Diagnosis and treatment planning for edentulous and partially edentulous patients – familiarity with patients, principles of perception, health questionnaires and identification data, problem identification, prognosis and treatment identification data, problem identification, prognosis and treatment planning – contributing history – patient's history, social information, medical status –

systemic status with special reference to debilitating diseases, diseases of the joints, cardiovascular disorders, diseases of the skin, neurological disorders, oral malignancies, climacteric, use of drugs, mental health – mental attitude, psychological changes, adaptability, geriatric changes – physiologic, pathological, pathological and intra oral changes. Intra oral health – mucus membrane, alveolar ridges, palate and vestibular sulcus and dental health.

Data collection and recording, visual observation, radiography, palpation, measurement of sulci or fossae, extra oral measurement, the vertical dimension of occlusion, diagnostic casts.

Specific observations – existing dentures, soft tissue health, hard tissue health – teeth, bone

Biomechanical considerations – jaw relations, border tissues, saliva, muscular development – muscle tone, neuromuscular co-ordination, tongue, cheek and lips.

Interpreting diagnostic findings and treatment planning

g) **Pre prosthetic surgery** –Improving the patients denture bearing areas andridge relations.

h) **Non surgical methods** –rest for the denture supporting tissues, occlusal correction of the old prosthesis, good nutrition, conditioning of the patients musculature,

i) **Surgical methods** –Correction of conditions, that preclude optimal prosthetic function – hyperplastic ridge – epulis fissuratum and papillomatosis, frenular attachments

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and pendulous maxillary tuberosities, ridge augmentation, maxillary and mandibular oral implants, corrections of congenital deformities, discrepancies in jaw size, relief of pressure on the mental foramen, enlargement of denture bearing areas, vestibuloplasty, ridge augmentation, replacement of tooth roots with Osseo integrated denture implants.

j) **Immediate Denture** –Advantages, Disadvantages, Contraindications,Diagnosis, treatment planning and Prognosis, Explanation to the patient, Oral examinations, Examination of existing prosthesis, Tooth modification, Prognosis, Referrals/adjunctive care, oral prophylaxis and other treatment needs.

First visit, preliminary impressions and diagnostic casts, management of loose teeth, custom trays, final impressions and master casts, two tray or sectional custom impression tray, location of posterior limit and jaw relation records, setting of the posterior denture teeth / verifying jaw relations and the patient try in.

Laboratory phase, setting of anterior teeth, Wax contouring, flasking and boil out, processing and finishing, surgical templates, surgery and immediate denture insertion, post operative care and patient instructions, subsequent service for the patient on the immediate denture.

k) **Over dentures** (tooth supported complete dentures)–indications andtreatment planning, advantages and disadvantages, selection of abutment teeth, loss of abutment teeth, tooth supported complete dentures. Non-coping abutments, abutment with copings, abutments with attachments, submerged vital roots, preparations of the retained teeth.

l) **Single Dentures:** Single Mandibular denture to oppose natural maxillaryteeth, single complete maxillary denture to oppose natural Mandibular teeth to oppose a partially edentulous Mandibular arch with fixed prosthesis, partially edentulous Mandibular arch with removable partial dentures. Opposing existing complete dentures, preservation of the residual alveolar ridge, necessity for retaining maxillary teeth and preventing mental trauma.

m) **Art of communication in the management of the edentulous predicament** – Communication–scope, a model of communication, why communication is important? What are the elements of effective communication? special significance of doctor / patient communication, doctor behavior, The iatro sedative (doctor & act of making calm) recognizing and acknowledging the problem, exploring and identifying the problem, interpreting and explaining the problem, offering a solution to the problem for mobilizing their resources to operate in a most efficient way, recognizing and acknowledging the problem, interpreting and explaining the problem, offering a solution to the problem.

n) **Materials prescribed in the management of edentulous patients -** Denture base materials, General requirements of biomaterials for edentulous patients, requirement of an ideal denture base, chemical composition of denture base resins, materials used in the fabrication of prosthetic denture teeth, requirement of prosthetic denture teeth, denture lining materials and tissue conditioners, cast metal alloys as denture bases – base metal alloys.

o) **Articulators – Evolution of concepts,** Classification, selection, limitations, precision, accuracy andsensitivity, and Functions of the articulator and their uses. Recent advancements including virtual articulator

p) **Fabrication of complete dentures** –complete denture impressions–muscles of facial expressions and anatomical landmarks, support, retention, stability, aims and objectives of preservation, support, stability, aesthetics, and retention. Impression materials and techniques – need of 2 impressions the preliminary impression and final impressions.

Developing an analogue / substitute for the maxillary denture bearing area – anatomy of supporting structures – mucous membrane, hard palate, residual ridge, shape of the supporting structure and factors that influence the form and size of the supporting bones, incisive foramen, maxillary tuberosity, sharp spiny process, torus palatinus, Anatomy of peripheral or limiting structures, labial vestibule, Buccal vestibule, vibrating lines. Preliminary and final impressions, impression making, custom tray and refining the custom tray, preparing the tray to secure the final impression, making the final impression, boxing impression and making the casts

Developing an analogue / substitute for the Mandibular denture bearing area- anatomy of supporting structure, crest of the residual ridge, buccal shelf, shape of

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supporting structure, mylohyoid ridge, mental foramen, genial tubercles, torus mandibularis, Anatomy of peripheral or limiting structure – labial vestibule, Buccal vestibule, lingual border, mylohyoid muscle, retromylohyoid fossa, sublingual gland region, alveolingual sulcus, Mandibular impressions – preliminary impressions, custom tray, refining, preparing the tray\, final impressions.

q) **Mandibular movements, Maxillo mandibular relations and concepts of occlusion –** Gnathology, identification of shape and location of arch form–Mandibular and maxillary occlusion rims, level of occlusal plane and recording of trail denture base, tests to determine vertical dimension of occlusion, interocclusal & centric relation records. Biological and clinical considerations in making jaw relation records and transferring records from the patients to the articulator, Recording of Mandibular movements – influence of opposing tooth contacts, temporomandibular joint, muscular involvements, neuromuscular regulation of Mandibular motion, the envelope of motion, rest position.

Maxillo – Mandibular relations – the centric, eccentric, physiologic rest position, vertical dimension, occlusion, recording methods – mechanical, physiological, Determining the horizontal jaw relation – Functional graphics, tactile or interocclusal check record method, Orientation / sagittal relation records, Arbitrary / Hinge axis and face bow record, significance and requirement, principles and biological considerations and securing on articulators.

r) **Selecting and arranging artificial teeth and occlusion for the edentulous patient –** anterior tooth selection, posterior tooth selection, and principles in

arrangement of teeth, and factors governing the position of teeth – horizontal & vertical relations. The inclinations and arrangement of teeth for aesthetics, phonetics and mechanics – to concept of occlusion.

s) **The Try in** –verifying vertical dimension, centric relation, establishment ofposterior palatal seal, creating a facial and functional harmony with anterior teeth, harmony of spaces of individual teeth position, harmony with sex, personality and age of the patient, co-relating aesthetics and incisal guidance.

t) **Speech considerations with complete dentures & speech production** –structural and functional demands, neuropsychological background, speech production and the roll of teeth and other oral structures – bilabial sounds, labiodental(s) sounds, linguodental sounds, linguoalveolar sound, articulatoric characteristics, acoustic characteristics, auditory characteristics, linguopalatal and linguoalveolar sounds, speech analysis and prosthetic considerations.

u) **Waxing contouring and processing the dentures their fit and insertion and after care** –laboratory procedure–wax contouring, flasking andprocessing, laboratory remount procedures, ***selective grinding***, finishing and polishing.

Critiquing the finished prosthesis – doctors evaluation, patients evaluation, friends evaluation, elimination of basal surface errors, errors in occlusion, interocclusal records for remounting procedures – verifying centric relation, eliminating occlusal errors.

Special instructions to the patient – appearance with new denture, mastication with new dentures, speaking with new dentures, oral hygiene with dentures, preservation of residual ridges and educational material for patients, maintaining the comfort and health of the oral cavity in the rehabilitated edentulous patients. Twenty-four hours oral examination and treatment and (preventive) Prosthodontic – periodontic recall for oral examination 3 to 4 months intervals and yearly intervals.

v) **Implant supported Prosthesis for partially edentulous patients** –Scienceof Osseo integration, clinical protocol ***(diagnostic,surgical and prosthetic)*** for treatment with implant supported over dentures, managing problems and complications. Implant Prosthodontics for edentulous patients: current and future directions.

Implant supported prosthesis for partially edentulous patients – Clinical and laboratory protocol: Implant supported prosthesis, managing problems and complications

- Introduction and Historical Review
- Biological, clinical and surgical aspects of oral implants
- Diagnosis and treatment planning

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- Radiological interpretation for selection of fixtures
- Splints for guidance fort surgical placement of fixtures
- ***Surgical and*** Intra oral plastic surgery, if any
- Guided bone and Tissue regeneration consideration for implants fixture.
- Implant supported prosthesis for complete edentulism and partial edentulism
- Occlusion for implant supported prosthesis.
- Peri-implant tissue and Management of peri-implantitis
- Maintenance and after care
- Management of failed restoration.
- Work authorization for implant supported prosthesis – definitive instructions, legal aspects, delineation of responsibility.

Prosthodontic treatment for partially edentulous patients – Removable partial Prosthodontics –

a. **Scope, definition** and terminology, Classification of partially edentulous arches - requirements of an acceptable method of classification, Kennedy's classification, Applegate's rules for applying the Kennedy classification

b. **Components of RPD** –

i) major connector–mandibular and maxillary

ii) minor connectors, design, functions & form and location of major and minor connectors, tissue stops, finishing lines, reaction of tissue to metallic coverage

iii) Rest and rest seats – form of the Occlusal rest and rest seat, interproximal Occlusal rest seats, internal Occlusal rests, possible movements of partial dentures, support for rests, lingual rests on canines and incisor teeth, incisal rest and rest seat.

iv) Direct retainers- Internal attachments & extracoronal direct retainers. Relative uniformity of retention, flexibility of clasp arms, stabilizing reciprocal clasp, criteria for selecting a given clasp design, the basic principles of clasp design, circumferential clasp, bar clasp, combination clasp and other type of retainers.

v) Indirect Retainers – denture rotation about an axis, factors influencing effectiveness of indirect retainers, forms of indirect retainers, auxiliary Occlusal rest, canine extensions from Occlusal rests, canine rests, continuous bar retainers and linguoplates, modification areas, rugae support, direct – indirect retention.

(vi) Teeth and denture bases – types, materials, advantages and dis-advantages, indications and contraindications and clinical use.

Principles of removable partial Denture design – Bio mechanical considerations, and the factors influencing after mouth preparations – Occlusal relationship of remaining teeth, orientation of Occlusal plane, available space for restoration, arch integrity, tooth morphology, response of oral structure to previous stress, periodontal conditions, abutment support, tooth supported and tooth and tissue supported, need for indirect retention, clasp design, need for rebasing, secondary impression, need for abutment tooth modification, type of major connector, type of teeth selection, patients past experience, method of replacing single teeth or missing anterior teeth.

Difference between tooth supported and tissue supported partial dentures. Essentials of partial denture design, components of partial denture design, tooth support, tissue support, stabilizing components, guiding planes, use of splint bar for denture support, internal clip attachments, overlay abutment as support for a denture base, use of a component partially to gain support.

c. **Education of patient**

d. **Diagnosis and treatment planning**

e. **Design, treatment sequencing and mouth preparation**

f. **Surveying** Description of dental surveyor, purposes of surveying, Aims andobjectives in surveying of diagnostic cast and master cast, Final path of insertion, factors that determine path of insertion and removal, Recording relation of cast to surveyor, measuring amount of retentive area Blocking of

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master cast – paralleled blockout, shaped blockout, arbitrary blockout and relief.

g. **Diagnosis and treatment planning** –Infection control and cross infectionbarriers – clinical and laboratory and hospital waste management, Objectives of prosthodontic treatment, Records, systemic evaluation, Oral examination, preparation of diagnostic cast, interpretation of examination data, radiographic interpretation, periodontal considerations, caries activity, prospective surgical preparation, endodontic treatment, analysis of occlusal factors, fixed restorations, orthodontic treatment, need for determining the design of components, impression procedures and occlusion, need for reshaping remaining teeth, reduction of unfavorable tooth contours, differential diagnosis : fixed or removable partial dentures, choice between complete denture and removable partial dentures, choice of materials

h. **Preparation of Mouth for removable partial dentures** –Oral surgicalpreparation, conditioning of abused and irritated tissues, periodontal preparation – objectives of periodontal therapy, periodontal diagnosis, control therapy, periodontal surgery.

i. **Preparation of Abutment teeth** –Classification of abutment teeth, sequenceof abutment preparations on sound enamel or existing restorations, conservative restorations using crowns, splinting abutment teeth, utilization, temporary crowns to be used as abutment.

j. **Impression Materials and Procedures for Removable Partial Dentures** –Rigid materials, thermoplastic materials, Elastic materials, Impressions of the partially edentulous arch, Tooth supported, tooth tissue supported, Individual impression trays.

k. **Support for the Distal Extension Denture Base** –Distal extensionremovable partial denture, Factors influencing the support of distal extension base, Methods of obtaining functional support for the distal extension base.

l. **Laboratory Procedures** –Duplicating a stone cast, Waxing the partialdenture framework, Anatomic replica patterns, Spruing, investing, burnout, casting and finishing of the partial denture framework, making record bases, occlusion rims, making a stone occlusal template from a functional occlusal record, arranging posterior teeth to an opposing cast or template, arrangement of anterior teeth, waxing and investing the partial denture before processing acrylic resin bases, processing the denture, remounting and occlusal correction to an occlusal template, polishing the denture.

m. **Initial placement, adjustment and servicing of the removable partial denture** –adjustments to bearing surfaces of denture framework, adjustmentof occlusion in harmony with natural and artificial dentition, instructions to the patient, follow – up services

n. **Relining and Rebasing the removable partial denture** –Relining toothsupported dentures bases, relining distal extension denture bases, methods of reestablishing occlusion on a relined partial denture.

o. **Repairs and additions to removable partial dentures** –Broken clasp arms,fractured occlusal rests, distortion or breakage of other components – major and minor connectors, loss of a tooth or teeth not involved in the support or retention of the restoration, loss of an abutment tooth necessitating its replacement and making a new direct retainer, Other types of repairs & repair by soldering.

p. **Removable partial denture considerations in maxillofacial prosthetics** – Maxillofacial prosthetics, intra oral prosthesis, design considerations,
maxillary prosthesis, Obturators, speech aids, palatal lifts, palatal augmentations, mandibular prosthesis, treatment planning, framework design, class I resection, Class II resection, mandibular flange prosthesis, jaw relation records.

q. **Management of failed restorations and work authorization details.**

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II. MAXILLOFACIAL REHABILITATION:

Scope, terminology, definitions, cross infection control and hospital waste management, work authorization.

Behavioral and psychological issues in Head and neck cancer, Psychodynamic interactions between clinician and patient. **Cancer Chemotherapy:** Oral Manifestations, Complications, and management, **Radiation therapy of head and neck tumors:** Oral effects, Dental manifestations and dental treatment: Etiology, treatment and rehabilitation (restoration).
Acquired defects of the mandible, acquired defects of hard palate, soft palate, clinical management of edentulous and partially edentulous maxillectomy patients, Facial defects, Restoration of speech, Velopharyngeal function, cleft lip and palate, cranial implants, maxillofacial trauma, Lip and cheek support prosthesis, Laryngectomy aids, Obstructive sleep apnoea, Tongue prosthesis, Oesophageal prosthesis, radiation carriers, Burn stents, Nasal stents, Vaginal and anal stents, Auditory inserts, Trismus appliances, mouth controlled devices for assisting the handicapped, custom prosthesis, conformers, and orbital prosthesis for ocular and orbital defects. Osseo integrated supported facial and maxillofacial prosthesis. Resin bonding for maxillofacial prosthesis, cranial prosthesis Implant rehabilitation of the mandible compromise by radiotherapy, Prosthodontic treatment, Material and laboratory procedures for maxillofacial prosthesis.

III. OCCLUSION

EVALUATION, DIAGNOSIS AND TREATMENT OF OCCLUSAL PROBLEMS:

Scope, definition, terminology, optimum oral health, anatomic harmony, functional harmony, occlusal stability, causes of deterioration of dental and oral health. Anatomical, physiological, neuro – muscular, psychological considerations of teeth; muscles of mastication; temporomandibular joint; intra oral and extra oral and facial musculatures and the functions of Cranio mandibular system.

Occlusal therapy, the stomatognathic system, centric relation, vertical dimension, the neutral zone, the occlusal plane, differential diagnosis of temporomandibular disorders, understanding and diagnosing intra articular problems, relating treatment to diagnosis of internal derangements of TMJ, Occlusal splints. Selecting instruments for occlusal diagnosis and treatment, mounting casts, Pankey-Mann-Schuyler philosophy of complete occlusal rehabilitation, long
centric, anterior guidance, restoring lower anterior teeth, restoring upper anterior teeth, determining the type of posterior occlusal contours, methods for determining the plane of occlusion, restoring lower posterior teeth, restoring upper posterior teeth, functionally generated path techniques for recording border movements intra orally, occlusal equilibration.
Bruxism, Procedural steps in restoring occlusion, requirements for occlusal stability, solving occlusal problems through programmed treatment planning, splinting, solving – occlusal wear problems, deep overbite problems, anterior overjet problems, anterior open bite problems. Treating – end to end occlusion, splaed anterior teeth, cross bite problems, Crowded, irregular, or interlocking anterior bite. Using Cephalometric for occlusal analysis, solving severe arch malrelationship problems, transcranial radiography, postoperative care of occlusal therapy.

IV. FIXED PROSTHODONTICS

Scope, definitions and terminology, classification and principles, design, mechanical and biological considerations of components – Retainers, connectors, pontics, work authorization.

- **Diagnosis and treatment planning** –patients history and interview, patientsdesires and expectations and needs, systemic and emotional health, clinical examinations – head and neck, oral – teeth, occlusal and periodontal, Preparation of diagnostic cast, radiographic interpretation, Aesthetics, endodontics considerations, abutment selection – bone support, root proximities and inclinations, selection of abutments for cantilever, pier

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abutments, splinting, available tooth structures and crown morphology, TMJ and muscles of mastication and comprehensive planning and prognosis.

- **Management of Carious teeth** –caries in aged population, caries control,removal caries, protection of pulp, reconstruction measure for compromised teeth – retentive pins, horizontal slots, retentive grooves, prevention of caries, diet, prevention of root caries and vaccine for caries.
- **Periodontal considerations** –attachment units, ligaments, prevention ofgingivitis, periodontitis. Microbiological aspect of periodontal diseases, marginal lesion, occlusal trauma, periodontal pockets in attached gingiva, interdental papilla, gingival embrasures, gingival/periodontal prosthesis, radiographic interpretations of Periodontia, intraoral, periodontal splinting – Fixed prosthodontics with periodontially compromised dentitions, placement of margin restorations.
- **Biomechanical principles of tooth preparation** –individual tooth preparations - Complete metal Crowns – P.F.C., All porcelain – Cerestore crowns, dicor crowns, inceram etc. porcelain jacket crowns; partial 3/4, 7/8, telescopic, pin– ledge, laminates, inlays, onlays. Preparations for restoration of teeth– amalgam, glass Ionomer and composite resins. Resin bond retainers, Gingival marginal preparations – Design, material selection, and biological and mechanical considerations – intracoronal retainer and precision attachments – custom made and prefabricated.

- **Isolation and fluid control –** Rubber dam application(s), tissue dilation–softtissue management for cast restoration, impression materials and techniques, provisional restorations, interocclusal records, laboratory support for fixed Prosthodontics, Occlusion, Occlusal equilibration, articulators, recording and transferring of occlusal relations, cementing of restorations.
- **Resins, Gold and gold alloys, glass Ionomer, restorations.**
- **Restoration of endodontically treated teeth, Stomatognathic Dysfunction and management**
- **Management of failed restorations**
  Osseo integrated supported fixed Prosthodontics –Osseo integratedsupported and tooth supported fixed Prosthodontics
- **CAD – CAM Prosthodontics**

V. TMJ – Temporomandibular joint dysfunction – Scope, definitions, and terminology

Temporomandibular joint and its function, Orofacial pain, and pain from the temporomandibular joint region, temporomandibular joint dysfunction, temporomandibular joint sounds, temporomandibular joint disorders, Anatomy related, trauma, disc displacement, Osteoarthrosis/Osteoarthritis, Hyper mobility and dislocation, infectious arthritis, inflammatory diseases, Eagle's syndrome (Styloid – stylohyoid syndrome), Synovial chondromatosis, Osteochondrosis disease, Ostonecrosis, Nerve entrapment process, Growth changes, Tumors, Radiographic imaging

- Etiology, diagnosis and cranio mandibular pain, differential diagnosis and management of orofacial pain – pain from teeth, pulp, dentin, muscle pain, TMJ pain – psychologic, physiologic – endogenous control, acupuncture analgesia, Placebo effects on analgesia, Trigeminal neuralgia, Temporal arteritis
- Occlusal splint therapy – construction and fitting of occlusal splints, management of occlusal splints, therapeutic effects of occlusal splints, occlusal splints and general muscles performance, TMJ joint uploading and anterior repositioning appliances, use and care of occlusal splints.
- Occlusal adjustment procedures – Reversible – occlusal stabilization splints and physical therapies, jaw exercises, jaw manipulation and other physiotherapy or irreversible therapy – occlusal repositioning appliances, orthodontic treatment,

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Orthognathic surgery, fixed and removable prosthodontic treatment and occlusal adjustment, removable prosthodontic treatment and occlusal adjustment. Indication for occlusal adjustment, special nature of orofacial pain, Psychopathological considerations, occlusal adjustment philosophies, mandibular position, excursive guidance, occlusal contact scheme, goals of occlusal adjustment, significance of a slide in centric, Preclinical procedures, clinical procedures for occlusal adjustment.

VI. ESTHETICS

SCOPE, DEFINITIONS :

Morpho psychology and esthetics, structural esthetic rules –facialcomponents, dental components, gingival components and physical components. Esthetics and its relationship to function – Crown morphology, physiology of occlusion, mastication, occlusal loading and clinical aspect in bio esthetic aspects, Physical and physiologic characteristic and muscular activities of facial muscle, perioral anatomy and muscle retaining exercises Smile – classification and smile components, smile design, esthetic restoration of smile, Esthetic management of the dentogingival unit, intraoral materials for management of gingival contours, and ridge contours, Periodontal esthetics, Restorations – Tooth colored restorative materials, the clinical and laboratory aspects, marginal fit, anatomy, inclinations, form, size, shape, color, embrasures & contact point.

Prosthodontic treatment should be practiced by developing skills, by treating various and more number of patients to establish skill to diagnose and treatment and after care with bio-mechanical, biological, bio-esthetics, bio-phonetics. All treatments should be carried out in more numbers for developing clinical skills.

- Infection control, cross infection barrier – clinical & lab ; hospital & lab waste management

Teaching / Learning Activities:

The post graduate is expected to complete the following at the end of :

I YEAR M.D.S.

- Theoretical exposure of all applied sciences
- ***Pre-clinical*** exercises involved in prosthodontic therapy for assessment
- Commencement of library assignment within six months
- To carry out short epidemiological study relevant to prosthodontics.
- Acquaintance with books, journals and referrals.
- To differentiate various types of articles published in and critically appraise based on standard reference guidelines.
- To develop the ability to gather evidence from published articles.
- To acquire knowledge of published books, journals and websites for the purpose of gaining knowledge and reference – in the field of ***Oral and Maxillofacial Prosthodontics and Implantology***
- Acquire knowledge of instruments, equipment, and research tools in Prosthodontics.
- To acquire knowledge of Dental Material Science – Biological and biomechanical & bio-esthetics, knowledge of using material in laboratory and clinics including testing methods for dental materials.
- Submit a protocol for their dissertation before Institutional Review Board and Institutional Ethics Committee.
- Participation and presentation in seminars, didactic lectures.

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II YEAR M.D.S.

- Acquiring confidence in obtaining various phases and techniques in removable and fixed prosthodontics therapy
- Acquiring confidence by clinical practice with sufficient number of patientsrequiring tooth and tooth surface restorations
- Fabrication of adequate number of complete denture prosthesis following, higher clinical approach by utilizing semi-adjustable articulators, face bow and graphic tracing.
- Understanding the use of dental surveyor and its application in diagnosis and treatment plan in R.P.D.
- Adequate number of R.P.D's covering all partially edentulous situations.
- Adequate number of Crowns, Inlays, laminates, ***FDP (fixed dental prosthesis)*** covering all clinical situations.
- Selection of cases and following principles in treatment of partially or complete edentulous patients by implant supported prosthesis.
- Treating single edentulous arch situations by implant supported prosthesis.
- Diagnosis and treatment planning for implant prosthesis.
- Ist stage and IInd stage implant surgery
- Understanding the maxillofacial ***Prosthodontics, treating craniofacial and management of orofacial defects***
- Prosthetic management of TMJ syndrome
- Occlusal rehabilitation
- Management of failed restorations.
- Prosthodontic management of patient with psychogenic disorder.
- Practice of child and geriatric prosthodontics.
- Participation and presentation in seminars, didactic and non didactic Teaching and Training students.

III YEAR M.D.S

- Clinical and laboratory practice continued from IInd year.
- Occlusion equilibration procedures – fabrication of stabilizing splint for parafunctional disorders, occlusal disorders and TMJ functions.
- Practice of dental, oral and facial esthetics
- The clinical practice of all aspects of Prosthodontic therapy for elderly patients.
- Implants Prosthodontics – Rehabilitation of Partial Edentulism, Complete edentulism and craniofacial rehabilitation.
- Failures in all aspects of Prosthodontics and their management and after care.
- Team management for esthetics, TMJ syndrome and Maxillofacial & Craniofacial Prosthodontics
- Management of Prosthodontic emergencies, resuscitation.
- Candidate should complete the course by attending a large number and variety of patients to master the prosthodontic therapy. This includes the practice management, examinations, treatment planning, communication with patients, clinical and laboratory techniques materials and instrumentation required in different aspects of prosthodontic therapy, Tooth and Tooth surface restoration, Restoration of root treated teeth, splints for periodontal rehabilitations and fractured jaws, complete dentures, R.P.D's, F.D.P's,
  Immediate dentures, over dentures, implant supported prosthesis, maxillofacial and body prosthesis, occlusal rehabilitation.
- Prosthetic management of TMJ syndrome
- Management of failed restorations
- Should complete and submit Main Dissertation assignment 6 months prior to examination.

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- Candidates should acquire complete theoretical and clinical knowledge through seminars, symposium, workshops and reading.
- Participation and presentation in seminars, didactic lectures

PROSTHODONTIC TREATMENT MODALITIES

1) Diagnosis and treatment planning prosthodontics
2) Tooth and tooth surface restorations
   - Fillings
   - Veneers – composites and ceramics
   - Inlays- composite, ceramic and alloys
   - Onlay – composite, ceramic and alloys
   - Partial crowns – ¾ th, 4/5th, 7/8th, Mesial ½ crowns
   - Pin-ledge
   - Radicular crowns
   - Full crowns

3) Tooth replacements

	Partial	**Complete**
• Tooth supported	Fixed partial denture	Overdenture
• Tissue supported	Interim partial denture	Complete denture
	Intermediate partial denture	Immediate denture
		Immediate complete denture
• Tooth and tissue Supported	Cast partial denture Precision attachment	Overdenture
• Implant supported	Cement retained Screw retained Clip attachment	Bar attachment Ball attachment
• Tooth and implant Supported	Screw retained Cement retained	Screw retained Cement retained
• **Root supported**	Dowel and core Pin retained	Over denture

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- Precision attachments
  - Intra coronal attachments
  - Extra coronal attachments
  - Bar – slide attachments
  - Joints and hinge joint attachments

4) Tooth and tissue defects (Maxillo- facial and Cranio-facial prosthesis)

A. **Congenital Defects**

a. Cleft lip and palate
b. Pierre Robin Syndrome
c. Ectodermal dysplasia
d. Hemifacial microstomia
e. Anodontia
f. Oligodontia
g. Malformed teeth

} cast partial dentures, implant supported prosthesis, complete dentures, fixed partial dentures

B. **Acquired defects**

a. Head and neck cancer patients – prosthodontic splints and stents
b. Restoration of facial defects
   – Auricular prosthesis
   – Nasal prosthesis
   – Orbital prosthesis
   – Craniofacial implants
c. Midfacial defects
d. Restoration of maxillofacial trauma
   e. Hemimandibulectomy
   f. Maxillectomy

} cast partial denture, implant supported Dentures

   g. Lip and cheek support prosthesis — complete dentures
   h. Ocular prosthesis
   i. Speech and Velopharyngeal prosthesis
   j. Laryngectomy aids
   k. Esophageal prosthesis
   l. Nasal stents
   m. Tongue prosthesis
   n. Burn stents
   o. Auditory inserts
   p. Trismus appliances

5) T.M.J and Occlusal disturbances

a. Occlusal equilibration
b. Splints - Diagnostic
   - Repositioners / Deprogrammers
c. Anterior bite planes
d. Posterior bite planes
e. Bite raising appliances
f. Occlusal rehabilitation

6) Esthetic/Smile designing

a. Laminates / Veneers
b. Tooth contouring (peg laterals, malformed teeth)
c. Tooth replacements
d. Team management

7) Psychological therapy

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a. Questionnaires
b. Charts, papers, photographs
c. Models
d. Case reports
e. Patient counseling
f. Behavioral modifications
g. Referrals

8) Geriatric Prosthodontics

a. Prosthodontics for the elderly
b. Behavioral and psychological counseling
c. Removable Prosthodontics
d. Fixed Prosthodontics
e. Implant supported Prosthodontics
f. Maxillofacial Prosthodontics
g. Psychological and physiological considerations

9) Preventive measures

a. Diet and nutrition modulation and counseling
b. Referrals

The bench work should be completed before the start of clinical work during the first year of the MDS Course

I. Complete dentures

1. Arrangements on adjustable articulator for
   - Class I
   - Class II
   - Class III
2. Various face bow transfers to adjustable articulators
3. Processing of characterized anatomical dentures

II. Removable partial dentures

1. Design for Kennedy's Classification
   (Survey, block out and design)
   a. Class I
   b. Class II
   c. Class III
   d. Class IV
2. Designing of various components of RPD
3. Wax pattern on refractory cast
   a. Class I
   b. Class II
   c. Class III
   d. Class IV
4. Casting and finishing of metal frameworks
5. Acrylisation on metal frameworks for
   Class I
   Class III with modification

III. Fixed Partial Denture

1. Preparations on ivory teeth / natural teeth
   - FVC for metal
   - FVC for ceramic
   - Porcelain jacket crown
   - Acrylic jacket crown
   - PFM crown
   - 3/4th (canine, premolar and central)

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- 7/8th posterior
- Proximal half crown

- Inlay – Class I, II, V
- Onlay – Pin ledged, pinhole
- Laminates

2. Preparation of different die systems

3. Fabrication of wax patterns by drop wax build up technique
   - Wax in increments to produce wax coping over dies of tooth preparations on substructures
   - Wax additive technique
   - 3-unit wax pattern (maxillary and Mandibular)
   - Full mouth

4. Pontic designs in wax pattern
   - Ridge lap
   - Sanitary
   - Modified ridge lap
   - Modified sanitary
   - Spheroidal or conical

5. Fabrication of metal frameworks
   - Full metal bridge for posterior (3 units)
   - Coping for anterior (3 unit)
   - Full metal with acrylic facing
   - Full metal with ceramic facing
   - Adhesive bridge for anteriors
   - Coping for metal margin ceramic crown
   - Pin ledge crown

6. Fabrication of crowns
   - All ceramic crowns with characterisation
   - Metal ceramic crowns with characterisation
   - Full metal crown
   - Precious metal crown
   - Post and core

7. Laminates
   - Composites with characterisation
   - Ceramic with characterisation
   - Acrylic

8. Preparation for composites
   - Laminates
   - Crown
   - Inlay
   - Onlay
   - Class I
   - Class II
   - Class III
   - Class IV
   - Fractured anterior tooth

IV. Maxillofacial prosthesis

- Eye

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- Ear
- Nose
- Face
- Body defects
  - Cranial
  - Maxillectomy
  - Hemimandibulectomy
  - Finger prosthesis
  - Guiding flange
  - Obturator

V. Implant supported prosthesis

1. Step by step procedures –***Surgical and*** laboratory phase

VI. Other exercises

1. TMJ splints – stabilization appliances, maxillary and Mandibular repositioning appliances
2. Anterior disocclusion appliances
3. Chrome cobalt and acrylic resin stabilization appliances
4. Modification in accommodation of irregularities in dentures
5. Occlusal splints
6. Periodontal splints
7. Precision attachments – custom made
8. Over denture coping
9. Full mouth rehabilitation (by drop wax technique, ceramic build up)
10. TMJ appliances – stabilization appliances

ESSENTIAL SKILLS:

*Key
O – Washes up and observes
A – Assists a senior
PA – Performs procedure under the direct supervision of a senior specialist
PI – Performs independently

The following list of procedures are expected of the post graduate to complete in the post graduate programme under faculty guidance [PA] or independently [PI] . Each of the following procedures should be evaluated for the competencies like critical thinking, patient centered approach, use of evidence based approach, professionalism, systems based practice approach and communication skills of the student. The mentioned numbers denote minimal requirement. However, the head of the department has the discretion to fix the quota and assess them systematically. There may be procedures which the student has observed [O] or assisted [A]. The student can however make his entry into his log book or portfolio wherein he/she can make his comments with remarks of the facilitator in the form of a feedback which would reinforce his learning.

PROCEDURE	CATEGORY			
	O	A	PA	PI
Tooth and tooth surface restoration a) Composites – fillings, laminates, inlay, onlay b) Ceramics – laminates, inlays, onlays c) Glass Ionomer				 5 5 5
CROWNS				

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FVC for metal				10
FVC for ceramic				10
Precious metal crown or Galvanoformed crown	1	-	1	5
Intraradicular crowns (central, lateral, canine, premolar, and molar)		-	-	5
Crown as implant supported prosthesis	As many	5	5	5
FIXED PARTIAL DENTURES				
Porcelain fused to metal (anterior and posterior)				10
Multiple abutments – maxillary and Mandibular full arch				5

Incorporation of custom made and prefabricated precision attachments			2	
Adhesive bridge for anterior/posterior		-		5
CAD – CAM Anterior/Posterior FPD	-	-		5
Interim provisional restorations (crowns and FPDs)				for all crowns and bridges
Immediate fixed partial dentures (interim) with ovate pontic		-	-	5
Fixed prosthesis as a retention and rehabilitation means for acquired and congenital defects – maxillofacial Prosthetics				5
Implant supported prosthesis		-		1
Implant – tooth supported prosthesis		-		1
REMOVABLE PARTIAL DENTURE				
Provisional partial denture prosthesis				10
Cast removable partial denture (for Kennedy's Applegate classification with modifications)				3
Removable bridge with precision attachments and Telescopic crowns for anterior and posterior edentulous Spaces				1
Immediate RPD				5
Partial denture for medically compromised and Handicapped patients				2
COMPLETE DENTURES				
Anatomic characterized prosthesis (by using semi adjustable articulator)	-	-		25
Single dentures	-	-		5
Overlay dentures	-	-		5
Interim complete dentures as a treatment prosthesis for abused denture supporting tissues	-	-		5
Complete denture prosthesis (for abnormal ridge relation, ridge form and ridge size)	-	-		5

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Complete dentures for patients with TMJsyndromes	-	-		2
Complete dentures for medically compromised and handicapped patients	-	-		2
GERIATRIC PATIENTS				
Handling geriatric patients requiring nutritional counseling, psychological management and management of co-morbitity including xerostomia and systemic problems. Palliative care to elderly.				
IMPLANT SUPPORTED COMPLETE PROSTHESIS				
Implant supported complete prosthesis (maxillary and Mandibular)	-	-		1
MAXILLOFACIAL PROSTHESIS				

e.g. Guiding flange/ obturators/ Speech and palatal lift prosthesis/ Eye/ Ear/ Nose/ Face/Finger/Hand/Foot	5 different types as PI

TMJ SYNDROME MANAGEMENT				
Splints – periodontal, teeth, jaws	-	-	1	1
TMJ supportive and treatment prosthesis	-	-	1	1
Stabilization appliances for maxilla and mandible with freedom to move from IP to CRCP	-	-	-	1
In IP without the freedom to move to CRCP	-	-	-	1
Repositioning appliances, anterior disocclusion appliances	-	-	-	1
Chrome cobalt and acrylic resin stabilization appliances for modification to accommodate for the irregularities in the dentition	-	-	-	1
Occlusal adjustment and occlusal equilibrium appliances	-	-	1	4
FULL MOUTH REHABILITATION				
Full mouth rehabilitation – restoration of esthetics and function of stomatognathic system	-	-	1	2
INTER-DISCIPLINARY TREATMENT MODALITIES				
Inter-disciplinary management – restoration of Oro craniofacial defects for esthetics, phonation, mastication and psychological comforts	-	-	1	2
MANAGEMENT OF FAILED RESTORATION				
Tooth and tooth surface restorations	-	-	-	5

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Removable prosthesis	-	-	-	5
Crowns and fixed prosthesis	-	-	-	5
Maxillofacial prosthesis	-	-	-	2
Implant supported prosthesis	-	-	-	1
Occlusal rehabilitation and TMJ syndrome	-	-	-	2
Restoration failures of psychogenic origin	-	-	-	2
Restoration failures to age changes	-	-	-	2

SCHEME 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 1 examination consists of two essays of 25 marks each and 10 short answers of 5 marks each. 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 and Paper III shall consist of two long answer questions carrying 25 marks each and five questions carrying 10 marks each. Distribution of topics for each paper will be as follows:***

Part-I : ***Applied Basic Sciences: Applied Anatomy***
Nutrition & Biochemistry, Pathology & Microbiology, virology, Applied Dental anatomy & histology, Oral pathology & oral Microbiology, Adult and geriatric psychology. Applied dental materials.

Part-II

Paper-I : ***Removable Prosthodontics and Implant supported prosthesis (Implantology), Geriatric dentistry and Cranio facial Prosthodontics***
Paper-II : ***Fixed Prosthodontics, Occlusion, TMJ and esthetics.***
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.*

A. Practical / Clinical Examination : 200 Marks

1. **Presentation of treated patients and records during their 3 years Training period** 35 Marks

a. C.D.	1 mark
b. R. P.D.	2 marks
c. F.P.D. including single tooth and surface restoration	2 marks
d. I.S.P.	5 marks
e. Occlusal rehabilitation	5 marks
f. T.M.J.	5 marks
g. Maxillofacial Prosthesis	5 marks
h. Pre Clinic Exercises	10 marks

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2. Presentation of Clinical Exam CD patient's prosthesis including insertion 75 Marks

1.	Discussion on treatment plan and patient review	10 marks
2.	Tentative jaw relation records	5 marks
3.	Face Bow – transfer	5 marks
4.	Transferring it on articulators	5 marks
5.	Extra oral tracing and securing centric and protrusive/lateral, record	15 marks
6.	Transferring records on articulator and programming.	5 marks
7.	Selection of teeth	5 marks
8.	Arrangement of teeth	10 marks
9.	Waxed up denture trial	10 marks
10.	Check of Fit, insertion and instruction of previously processed characterised, anatomic complete denture Prosthesis	5 marks

ALL STEPS WILL INCLUDE CHAIRSIDE, LAB AND VIVA VOCE

3. Fixed Partial Denture **35 Marks**

a. Case discussion including treatment planning and selection of patient for F.P.D. — 5 Marks
b. Abutment preparation isolation and fluid control — 15 marks
c. Gingival retraction and impressions (conventional/ CAD CAM impressions — 10 marks
d. Cementation of provisional restoration — 5 marks

4. Removable Partial Denture **25 Marks**

a. Surveying and designing of partial dentate cast. — *5 marks*
b. Discussion on components and material selection including occulsal schemes. — *10 marks*

5. Implant supported prosthesis (2nd stage- protocol) ***30 marks***

a. Case discussion including treatment planning and selection of patient for ISP — *10 marks*
b. II stage preparation, Abutment selection, placement, evaluation — *10 marks*
c. Implant impression and making of cast — *10 marks*

B. Viva Voce : **100 Marks**

I. Viva-Voce examination: *80 marks*

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

II. Pedagogy *20 marks*

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2. PERIODONTOLOGY:

OBJECTIVES:

The following objectives are laid out to achieve the goals of the course

A) KNOWLEDGE:

Discuss historical perspective to advancement in the subject proper and related topics.

- Describe etiology, pathogenesis, diagnosis and management of common periodontal diseases with emphasis on Indian population
- Familiarize with the biochemical, microbiologic and immunologic genetic aspects of periodontal pathology
- Describe various preventive periodontal measures
- Describe various treatment modalities of periodontal disease from historical aspect to currently available ones
- Describe interrelationship between periodontal disease and various systemic conditions
- Describe periodontal hazards due to estrogenic causes and deleterious habits and prevention of it
- Identify rarities in periodontal disease and environmental/Emotional determinates in a given case
- Recognize conditions that may be outside the area of his/her Speciality/ competence and refer them to an appropriate Specialist
- Decide regarding non-surgical or surgical management of the case
- Update the student by attending courses, conferences and seminars relevant to periodontics or by self-learning process.
- Plan out/ carry out research activity both basic and clinical aspects with the aim of publishing his/her work in scientific journals
- Reach to the public to motivate and educate regarding periodontal disease, its prevention and consequences if not treated
- Plan out epidemiological survey to assess prevalence and incidence of early onset periodontitis and adult periodontitis in Indian population (Region wise)
- Shall develop knowledge, skill in the science and practice of Oral Implantology
- Shall develop teaching skill in the field of Periodontology and Oral Implantology
- Principals of Surgery and Medical Emergencies.
- To sensitize students about inter disciplinary approach towards the soft tissues of the oral cavity with the help of specialist from other departments.

B) SKILLS:

- Take a proper clinical history, thorough examination of intra oral, extra oral, medical history evaluation, advice essential diagnostic procedures and interpret them to come to a reasonable diagnosis
- Effective motivation and education regarding periodontal disease maintenance after the treatment
- Perform both non-surgical & education regarding periodontal disease, maintenance after the treatment
- Perform both non-surgical and surgical procedures independently
- Provide Basic Life Support Service (BLS) recognizes the need for advance life support and does the immediate need for that.
- Human values, ethical practice to communication abilities

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- Adopt ethical principles in all aspects of treatment modalities; Professional honesty & integrity are to be fostered. Develop Communication skills to make awareness regarding periodontal disease Apply high moral and ethical standards while carrying out human or animal research, Be humble, accept the limitations in his/her knowledge and skill, and ask for help from colleagues when needed, Respect patients rights and privileges, including patients right to information and right to seek a second opinion.
- To learn the principal of lip repositioning and perio esthetics surgeries.

COURSE CONTENTS:

PART-I:

APPLIED BASIC SCIENCES

APPLIED ANATOMY:

1. Development of the Periodontium
2. Micro and Macro structural anatomy and biology of the periodontal tissues
3. Age changes in the periodontal tissues
4. Anatomy of the Periodontium
   - Macroscopic and microscopic anatomy
   - Blood supply of the Periodontium
   - Lymphatic system of the Periodontium
   - Nerves of the Periodontium
5. Temporomandibular joint, Maxillae and Mandible
6. Tongue, oropharynx
7. Muscles of mastication / Face
8. Blood Supply and Nerve Supply of Head & Neck and Lymphatics.
9. Spaces of Head & Neck

PHYSIOLOGY:

1. Blood
2. Respiratory system – knowledge of the respiratory diseases which are a cause of periodontal diseases (periodontal Medicine)
3. Cardiovascular system
   a. Blood pressure
   b. Normal ECG
   c. Shock
4. Endocrinology – hormonal influences on Periodontium
5. Gastrointestinal system
   a. Salivary secretion – composition, function & regulation
   b. Reproductive physiology
   c. Hormones – Actions and regulations, role in periodontal disease
   d. Family planning methods
6. Nervous system
   a. Pain pathways
   b. Taste – Taste buds, primary taste sensation & pathways for sensation
7. Hemostasis

BIOCHEMISTRY:

1. Basics of carbohydrates, lipids, proteins, vitamins, enzymes and minerals
2. Diet and nutrition and periodontium
3. Biochemical tests and their significance
4. Calcium and phosphorus

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PATHOLOGY:

1. Cell structure and metabolism
2. Inflammation and repair, necrosis and degeneration
3. Immunity and hypersensitivity
4. Circulatory disturbances – edema, hemorrhage, shock, thrombosis, embolism, infarction and hypertension
5. Disturbances of nutrition
6. Diabetes mellitus
7. Cellular growth and differentiation, regulation
8. Lab investigations
9. Blood

MICROBIOLOGY:

1. General bacteriology
   a. Identification of bacteria
   b. Culture media and methods
   c. Sterilization and disinfection
2. Immunology and Infection
3. Systemic bacteriology with special emphasis on oral microbiology – staphylococci, genus actinomyces and other filamentous bacteria and actinobacillus actinomycetum comitans
4. Virology
   a. General properties of viruses
   b. Herpes, Hepatitis, virus, HIV virus
5. Mycology
   a. Candidiasis
6. Applied microbiology
7. Diagnostic microbiology and immunology, hospital infections and management

PHARMACOLOGY:

1. General pharmacology
   a. Definitions – Pharmacokinetics with clinical applications, routes of administration including local drug delivery in Periodontics
   b. Adverse drug reactions and drug interactions
2. Detailed pharmacology of
   a. Analgesics – opiod and nonopiod
   b. Local anesthetics
   c. Haematinics and coagulants, Anticoagulants
   d. Vit D and Calcium preparations
   e. Antidiabetics drugs
   f. Steroids
   g. Antibiotics
   h. Antihypertensive
   i. Immunosuppressive drugs and their effects on oral tissues
   j. Antiepileptic drugs
3. Brief pharmacology, dental use and adverse effects of
   a. General anesthetics
   b. Antipsychotics
   c. Antidepressants
   d. Anxiolytic drugs
   e. Sedatives
   f. Antiepileptics
   g. Antihypertensives
   h. Antianginal drugs
   i. Diuretics

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   j. Hormones
   k. Pre-anesthetic medications
4. Drugs used in Bronchial asthma, cough
5. Drug therapy of
   a. Emergencies
   b. Seizures
   c. Anaphylaxis
   d. Bleeding
   e. Shock
   f. Diabetic ketoacidosis
   g. Acute addisonian crisis
6. Dental Pharmacology
   a. Antiseptics
   b. Astringents
   c. Sialogogues
   d. Disclosing agents
   e. Antiplaque agents
7. Fluoride pharmacology

BIOSTATISTICS:

1. Introduction, definition and branches of biostatistics
2. Collection of data, sampling, types, bias and errors
3. Compiling data-graphs and charts
4. Measures of central tendency (mean, median and mode), standard deviation and variability
5. Tests of significance (chi square test, t-test and z-test)
   Null hypothesis

PART II

PAPER 1

ETIOPATHOGENESIS:

1. Classification of periodontal diseases and conditions
2. Epidemiology of gingival and periodontal diseases
3. Defense mechanisms of gingival
4. Periodontal microbiology
5. Basic concepts of inflammation and immunity
6. Microbial interactions with the host in periodontal diseases
7. Pathogenesis of plaque associated periodontal diseases
8. Dental calculus
9. Role of iatrogenic and other local factors
10. Genetic factors associated with periodontal diseases
11. Influence of systemic diseases and disorders of the periodontium
12. Role of environmental factors in the etiology of periodontal disease
13. Stress and periodontal diseases
14. Occlusion and periodontal diseases
15. Smoking and tobacco in the etiology of periodontal diseases
16. AIDS and periodontium
17. Periodontal medicine
18. Dentinal hypersensitivity

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PAPER-II

CLINICAL AND THERAPEUTIC PERIODONTOLOGY AND ORAL IMPLANTOLOGY

Please note:
Clinical periodontology includes gingival diseases, periodontal diseases, periodontal instrumentation, diagnosis, prognosis and treatment of periodontal diseases.

(i) GINGIVAL DISEASES

1. Gingival inflammation
2. Clinical features of gingivitis
3. Gingival enlargement
4. Acute gingival infections
5. Desquamative gingivitis and oral mucous membrane diseases
6. Gingival diseases in the childhood

(ii) PERIODONTAL DISEASES

1. Periodontal pocket
2. Bone loss and patterns of bone destruction
3. Periodontal response to external forces
4. Masticatory system disorders
5. Chronic periodontitis
6. Aggressive periodontitis
7. Necrotising ulcerative periodontitis
8. Interdisciplinary approaches
   - Orthodontic
   - Endodontic

(iii) TREATMENT OF PERIODONTAL DISEASES

A. History, examination, diagnosis, prognosis and treatment planning
   1. Clinical diagnosis
   2. Radiographic and other aids in the diagnosis of periodontal diseases
   3. Advanced diagnostic techniques
   4. Risk assessment
   5. Determination of prognosis
   6. Treatment plan
   7. Rationale for periodontal treatment
   8. General principles of anti-infective therapy with special emphasis on infection control in periodontal practice
   9. Halitosis and its treatment
   10. Bruxism and its treatment

B. Periodontal instrumentation
   1. Periodontal Instruments
   2. Principles of periodontal instrumentation

C. Periodontal therapy
   1. Preparation of tooth surface
   2. Plaque control
   3. Anti microbial and other drugs used in periodontal therapy and wasting diseases of teeth
   4. Periodontal management of HIV infected patients
   5. Occlusal evaluation and therapy in the management of periodontal diseases
   6. Role of orthodontics as an adjunct to periodontal therapy
   7. Special emphasis on precautions and treatment for medically compromised patients
   8. Periodontal splints

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9. Management of dentinal hypersensitivity

D. Periodontal surgical phase – special emphasis on drug prescription
   1. General principles of periodontal surgery
   2. Surgical anatomy of periodontium and related structures
   3. Gingival curettage
   4. Gingivectomy technique
   5. Treatment of gingival enlargements
   6. Periodontal flap
   7. Osseous surgery (resective and regenerative)
   8. Furcation; Problem and its management
   9. The periodontic – endodontic continuum
   10. Periodontic plastic and esthetic surgery
   11. Recent advances in surgical techniques

E. Future directions and controversial questions in periodontal therapy
   1. Future directions for infection control
   2. Research directions in regenerative therapy
   3. Future directions in anti-inflammatory therapy
   4. Future directions in measurement of periodontal diseases

F. Periodontal maintenance phase
   1. Supportive periodontal treatment
   2. Results of periodontal treatment

(iv) ORAL IMPLANTOLOGY

1. Introduction and historical review
2. Biological, clinical and surgical aspects of dental implants
3. Diagnosis and treatment planning
4. Implant surgery
5. Prosthetic aspects of dental implants
6. Diagnosis and treatment of Peri implant complications
7. Special emphasis on plaque control measures in implant patients
8. Maintenance phase

(v) MANAGEMENT OF MEDICAL EMERGENCIES IN PERIODONTAL PRACTICE

Periodontology treatment should be practiced by various treatment plans and more number of patients to establish skill for diagnosis and treatment and after care with bio-mechanical, biological, bio-esthetics, bio-phonetics and all treatment should be carried out in more number for developing clinical skill.

TEACHING / LEARNING ACTIVITIES:

The post graduate is expected to complete the following at the end of :

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S.NO	Year Wise	ACTIVITIES WORKS TO BE DONE
1.	**Module 1 (First Year)**	Orientation to the PG program **Pre-clinical work (4 months)** **a. Dental** 1. Practice of incisions and suturing techniques on the typodont models. 2. Fabrication of bite guards and splints. 3. Occlusal adjustment on the casts mounted on the

		articulator 4. X-ray techniques and interpretation. 5. Local anaesthetic techniques. 6. Identification of Common Periodontal Instruments. 7. To learn science of Periodontal Instruments maintance (Sharpening , Sterlization and Storate) 8. Concept of Biological width a. Typhodont Exercise (i) Class II Filling with Band and Wedge Application (ii) Crown cuttings **b. Medical** 1. Basic diagnostic microbiology and immunology, collection and handling of sample and culture techniques. 2. Introduction to genetics, bioinformatics. 3. Basic understanding of cell biology and immunological diseases. **Clinical work** 1. Applied periodontal indices 10 cases 2. Scaling and root planning:- with Proper written history a. Manual 20 Cases b. Ultrasonic 20 Cases 3. Observation / assessment of all periodontal procedures including implants
2.	**Module 2 (First Year)**	1. Interpretation of various bio-chemical investigations. 2. Practical training and handling medical emergencies and basic life support devices. 3. Basic biostatistics – Surveying and data analysis. **Clinical** 1. Case history and treatment planning 10 cases 2. Root planning 50 cases 3. Observation / assessment of all periodontal procedures including implant. 4. Selection of topic for Library dissertation and submission of Dissertation Synopsis.
3.	**Module 3 (First Year)**	Minor surgical cases 20 cases (i) Gingival Depigmentation 3 Cases (ii) Gingival Curettage no limits (iii) ENAP 1 Case (iv) Gingivectomy/ Gingivoplasty 5 cases (v) Operculectomy 3 cases Poster Presentation at the Speciality conference
4.	**Module 4 (Second Year)**	**Clinical work** 1. Case history and treatment planning 10 cases 2. Occlusal adjustments 10 cases 3. Perio splints 10 cases 4. Local drug delivery techniques 5 cases 5. Screening cases for dissertation
5.	**Module 5 (Second Year)**	1. Periodontal surgical procedures. a. Basic flap procedures 20 cases 2. Periodontal plastic and esthetic 10 cases a. Increasing width of attached gingival 5 cases

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		b. Root coverage procedures / Papilla Preservation and Reconstruction 5 cases c. Crown lengthening procedures 5 cases d. Frenectomy 5 cases e. Vestibuloplasty 5 cases 3. Furcation treatment (Hemisection, Rootsection, Tunelling) 5 cases 4. Surgical closure of diastema. 2 cases
6.	**Module 6 (Third Year)**	1. Ridge augmentation procedures 5 cases 2. Implants Placements and monitoring 5 cases 3. Sinus lift procedures 2 cases 4. Case selection, preparation and investigation of implants. 5. Interdisciplinary Periodontics 2 each (i) Ortho – Perio (ii) Endo – Perio (iii) Restorative Perio (iv) Preprosthetic (v) Crown Prep 6. Osseous Surgery 2 each (i) Resective (ii) Regenerative 7. Scientific paper/ poster presentation at the conference.
7.	**Module 7 (Third Year)**	**Clinical work** 1. Flap surgeries & regenerative techniques 25 cases (using various grafts & barrier membranes) 2. Assistance / observation of advanced surgical procedure 5 each 3. Micro Surgery 5 each 4. Record maintenance & follow-up of all treated cases including implants. 5. Submission of dissertation – 6 months before completion of III year. 6. Scientific paper presentation at conferences.
8.	**Module 8 (Third Year)**	1. Refining of surgical skills. 2. Publication of an article in a scientific journal. 3. Preparation for final exams.
9.	**Module 9 (Third Year)**	1. Preparation for final exams. 2. University exam

Note: Maintenance of Work Diary / Check list / Log books as prescribed.

ASSESSMENT EXAMINATION:
In addition to regular evaluation, log book etc., Assessment examination should be conducted after every 3 modules & progress of the student monitored.

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.

SCHEME OF EXAMINATION:

A. Theory: Part-I: Basic Sciences Paper - **100 Marks**

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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 Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.

Part-II

Paper I: Normal Periodontal structure, Etiology & Pathogenesis of Periodontal diseases, epidemiology as related to Periodontics

Paper II: Periodontal diagnosis, therapy & Oral Implantology

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

The clinical examination shall be of two days duration

1st day

Case discussion

- Long case - One
- Short case - One

Periodontal surgery – Periodontal Surgery on a previously prepared case after getting approval from the examiners

2nd day

Post-surgical review and discussion of the case treated on the 1st day

Presentation of dissertation & discussion

All the examiners shall participate in all the aspects of clinical examinations / Viva Voce

Distribution of Marks for Clinical examination (recommended)

a) Long Case discussion		75	
b) 1 short case		25	
c) Periodontal surgery	1.	Anesthesia	10
	2.	Incision	20
	3.	Post Surgery Evaluation	25
	4.	Sutures	10

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	5.	Pack (if any)	10
Post – operative review		25	
Total		**200**	

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 will 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.

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3. ORAL AND MAXILLOFACIAL SURGERY

OBJECTIVES:

The training program in Oral and Maxillofacial Surgery is structured to achieve the following five objectives-

- Knowledge
- Skills
- Attitude
- Communicative skills and ability
- Research

Knowledge:

- To have acquired adequate knowledge and understanding of the etiology, pathophysiology and diagnosis, treatment planning of various common oral and Maxillofacial surgical problems both minor and major in nature
- To have understood the general surgical principles like pre and post surgical management, particularly evaluation, post surgical care, fluid and electrolyte management, blood transfusion and post surgical pain management.
- Understanding of basic sciences relevant to practice of oral and maxillofacial surgery
- Able to identify social, cultural, economic, genetic and environmental factors and their relevance to disease process management in the oral and Maxillofacial region.
- Essential knowledge of personal hygiene and infection control, prevention of cross infection and safe disposal of hospital waste keeping in view the high prevalence of hepatitis and HIV.

Skills:

- To obtain proper clinical history, methodical examination of the patient, perform essential diagnostic procedures and order relevant laboratory tests and interpret them and to arrive at a reasonable diagnosis about the surgical condition.
- To perform with competence minor oral surgical procedures and common maxillofacial surgery. To treat both surgically and medically the problems of the oral and Maxillofacial and the related area.
- Capable of providing care for maxillofacial surgery patients.

Attitude:

- Develop attitude to adopt ethical principles in all aspect of surgical practice, professional honesty and integrity are to be fostered. Surgical care is to be delivered irrespective of the social status, caste, creed or religion of the patient.
- Willing to share the knowledge and clinical experience with professional colleagues.
- Willing to adopt new techniques of surgical management developed from time to time based on scientific research which are in the best interest of the patient
- Respect patient right and privileges, including patients right to information and right to seek a second opinion.
- Develop attitude to seek opinion from an allied medical and dental specialists as and when required.

Communication Skills:

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- Develop adequate communication skills particularly with the patients giving them the various options available to manage a particular surgical problem and obtain a true informed consent from them for the most appropriate treatment available at that point of time
- Develop the ability to communicate with professional colleagues.
- Develop ability to teach undergraduates.

COURSE CONTENT:

The speciality of Oral & Maxillofacial Surgery deals with the diagnosis and management of the diseases of stomatognathic system, jaw bones, cranio-maxillofacial region, salivary glands and temporomandibular joints etc. Within this framework it also supports many vital organs like eye, oropharynx, nasopharynx and major blood vessels and nerves. The traumatic injuries of maxillofacial skeleton are independently managed by Oral & Maxillofacial Surgeons. Whenever there are orbital injuries the ophthalmologists are trained only to tackle injuries of the eye ball (globe) but if there are associated injuries of the orbital skeleton, the Maxillofacial Surgeon is involved in its re-construction. Similarly, nasal bone fracture may be managed by ENT surgeons. Most of the time nasal bone fractures are associated with fractures of the maxilla, mandible and zygomatic bones which are being managed by Oral & Maxillofacial Surgeons. The maxillofacial facial injuries at times are associated with head injuries also. The Oral & maxillofacial Surgeon is involved in the management of cleft lip & cleft palate, orthognathic surgery, micro vascular surgery, reconstructive and oncological surgical procedures of maxillofacial region. The speciality of Oral & Maxillofacial Surgery is a multi disciplinary speciality and needs close working in co-ordination with Neurosurgeons, Oncosurgeons, Opthalmologists, ENT Surgeons and Plastic Surgeons. The Oral & Maxillofacial Surgeons, Ophthalmologist, ENT Surgeons, Plastic Surgeons, Neuro-Surgeons and Oncologists complement each other by performing Surgical Procedures with their respective expertise and knowledge thereby benefiting the patients and students of the respective specialities.

The program outline addresses both the knowledge needed in Oral and Maxillofacial Surgery and allied medical specialties in its scope. A minimum of three years of formal training through a graded system of education as specified will equip the trainee with skill and knowledge at its completion to be able to practice basic oral and Maxillofacial surgery competently and have the ability to intelligently pursue further apprenticeship towards advanced Maxillofacial surgery.

The topics are considered as under:-

A) Applied Basic sciences
B) Oral and Maxillofacial surgery
C) Allied specialties

A) Applied Basic Sciences:

Applied Anatomy, Physiology, Biochemistry, General and Oral Pathology and Microbiology, Pharmacology and Knowledge in Basic Statistics.

Applied Anatomy:

1. Surgical anatomy of the scalp, temple and face
2. Anatomy of the triangles of neck and deep structures of the neck
3. Cranial and facial bones and its surrounding soft tissues with its applied aspects in maxillofacial injuries.
4. Muscles of head and neck; chest , lower and upper extremities (in consideration to grafts/flaps)
5. Arterial supply, venous drainage and lymphatics of head and neck

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6. Congenital abnormalities of the head and neck
7. Surgical anatomy of the cranial nerves
8. Anatomy of the tongue and its applied aspects
9. Surgical anatomy of the temporal and infratemporal regions
10. Anatomy and its applied aspects of salivary glands, pharynx, thyroid and parathyroid gland, larynx, trachea, esophagus
11. Tooth eruption, morphology, and occlusion.
12. Surgical anatomy of the nose.
13. The structure and function of the brain including surgical anatomy of intra cranial venous sinuses.
14. Autonomous nervous system of head and neck
15. Functional anatomy of mastication, deglutition, speech, respiration and circulation
16. Development of face, paranasal sinuses and associated structures and their anomalies
17. TMJ: surgical anatomy and function

Physiology:

1. **Nervous system**
   - Physiology of nerve conduction, pain pathway, sympathetic and parasympathetic nervous system, hypothalamus and mechanism of controlling body temperature
2. **Blood**
   - Composition
   - Haemostasis, various blood dyscrasias and management of patients with the same
   - Hemorrhage and its control
   - Capillary and lymphatic circulation.
   - Blood grouping, transfusing procedures.
3. **Digestive system**
   - Saliva - composition and functions of saliva
   - Mastication, deglutition, digestion, assimilation
   - Urine formation, normal and abnormal constituents
4. **Respiration**
   - Control of ventilation, anoxia, asphyxia, artificial respiration
   - Hypoxia – types and management
5. **CardioVascular System**
   - Cardiac cycle,
   - Shock
   - Heart sounds,
   - Blood pressure,
   - Hypertension:
6. **Endocrinology**
   - General endocrinal activity and disorder relating to thyroid gland,
   - Parathyroid gland, adrenal gland, pituitary gland, pancreas and gonads:
   - Metabolism of calcium

7. **Nutrition**
   - General principles of a balanced diet, effect of dietary deficiency, protein energy malnutrition, Kwashiorkor, Marasmus.
   - Fluid and Electrolytic balance in maintaining haemostasis and significance in minor and major surgical procedures.

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Biochemistry:

- General principles governing the various biological activities of the body, such as osmotic pressure, electrolytes, dissociation, oxidation, reduction etc.
- General composition of the body
- Intermediary metabolism
- Carbohydrates, proteins, lipids, and their metabolism
- Nucleoproteins, nucleic acid and nucleotides and their metabolism
- Enzymes, vitamins and minerals
- Hormones
- Body and other fluids.
- Metabolism of inorganic elements.
- Detoxification in the body.
- Antimetabolites.

Pathology:

1. **Inflammation –**
   - Repair and regeneration, necrosis and gangrene
   - Role of component 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 manifestation:
2. **Haemostasis**
   - Role of endothelium in thrombogenesis,
   - Arterial and venous thrombi,
   - Disseminated Intravascular coagulation
3. **Shock:**
   - Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock
   - Circulatory disturbances, ischemia, hyperemia, venous congestion, edema, infarction
4. **Chromosomal abnormalities:**
   - Marfans Syndrome, Ehler's Danlos Syndrome, Fragile X- Syndrome
5. **Hypersensitivity:**
   - Anaphylaxis, type 2 hypersensitivity, type 3 hyper sensitivity and cell mediated reaction and its clinical importance, systemic lupus erythematosus.
   - Infection and infective granulomas.
6. **Neoplasia:**
   - Classification of tumors.
   - Carcinogenesis and carcinogens- chemical, viral and microbial
   - Grading and staging of cancers, tumor Angiogenesis, Paraneoplastic syndrome, spread of tumors
   - Characteristics of benign and malignant tumors
7. **Others:**
   - Sex linked agammaglobulinemia.
   - AIDS
   - Management of immuno deficiency patients requiring surgical procedures
   - De George Syndrome

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- Ghons complex, post primary pulmonary tuberculosis – pathology and pathogenesis.

Oral Pathology:

- Developmental disturbances of oral and Para oral structures
- Regressive changes of teeth.
- Bacterial, viral and mycotic infections of oral cavity
- Dental caries,, diseases of pulp and periapical tissues
- Physical and chemical injuries of the oral cavity
- Oral manifestations of metabolic and endocrinal disturbances
- Diseases of jawbones and TMJ
- Diseases of blood and blood forming organs in relation to oral cavity
- Cysts of the oral cavity
- Salivary gland diseases
- Role of laboratory investigations in oral surgery

Microbiology:

- Immunity
- Knowledge of organisms commonly associated with diseases of oral cavity.
- Morphology cultural characteristics of strepto, staphylo, pneumo, gono, meningo, clostridium group of organisms, spirochetes, organisms of TB, leprosy, diphtheria, actinomycosis and moniliasis
- Hepatitis B and its prophylaxis
- Culture and sensitivity test
- Laboratory determinations
- Blood groups, blood matching, RBC and WBC count
- Bleeding and clotting time etc, smears and cultures,
- Urine analysis and cultures.

Applied Pharmacology and Therapeutics:

1. Definition of terminologies used
2. Dosage and mode of administration of drugs.
3. Action and fate of drugs in the body
4. Drug addiction, tolerance and hypersensitivity reactions.
5. Drugs acting on the CNS
6. General and local anesthetics, hypnotics, analeptics, and tranquilizers.
7. Chemo therapeutics and antibiotics
8. Analgesics and antipyretics
9. Antitubercular and antisyphilitic drugs.
10. Antiseptics, sialogogues and antisialogogues
11. Haematinics
12. Antidiabetics
13. Vitamins A, B-complex, C, D, E, K

B) Oral and Maxillofacial Surgery:

- Evolution of Maxillofacial surgery.
- Diagnosis, history taking, clinical examination, investigations.
- Informed consent/medico-legal issues.
- Concept of essential drugs and rational use of drugs.

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- Communication skills with patients- understanding, clarity in communication, compassionate explanations and giving emotional support at the time of suffering and bereavement
- Principles of surgical audit – understanding the audit of process and outcome. Methods adopted for the same. Basic statistics.
- Principles of evidence based surgery- understanding journal based literature study; the value of textbook, reference book articles, value of review articles; original articles and their critical assessment, understanding the value of retrospective, prospective, randomized control and blinded studies, understanding the principles and the meaning of various Bio-statistical tests applied in these studies.
- Principles of surgery- developing a surgical diagnosis, basic necessities for surgery, aseptic technique, incisions, flap designs, tissue handling, hemostasis, dead space management, decontamination and debridement, suturing, edema control, patient general health and nutrition.
- Medical emergencies – Prevention and management of altered consciousness, hyper sensitivity reaction, chest discomfort, respiratory difficulty.
- Pre operative workup – Concept of fitness for surgery; basic medical work up; work up in special situation like diabetes, renal failure, cardiac and respiratory illness; risk stratification
- Surgical sutures, drains
- Post operative care- concept of recovery room care, Airway management, Assessment of Wakefulness, management of cardio vascular instability in this period, Criteria for shifting to the ward, pain management
- Wound management- Wound healing, factors influencing healing, basic surgical techniques, Properties of suture materials, appropriate use of sutures.
- Surgical Infections – Asepsis and antisepsis, Microbiological principles, Rational use of antibiotics, special infections like Synergistic Gangrene and Diabetic foot infection, Hepatitis and HIV infection and cross infection.
- Airway obstruction/management – Anatomy of the airway, principles of keeping the airway patent, mouth to mouth resuscitation, Oropharyngeal airway, endotracheal intubation, Cricothyroidectomy, Tracheostomy.
- Anesthesia – stages of Anesthesia, pharmacology of inhalation, intravenous and regional anesthetics, muscle relaxants.
- Facial pain; Facial palsy and nerve injuries.
- Pain control – acute and chronic pain, cancer and non-cancer pain, patient controlled analgesia
- General patient management – competence in physical assessment of patients of surgery, competence in evaluation of patients presenting with acute injury, particularly to maxillofacial region. Competence in the evaluation of management of patients for Anesthesia
- Clinical oral surgery – all aspects of dento alveolar surgery
- Pre-prosthetic surgery – A wide range of surgical reconstructive procedures involving their hard and soft tissues of the edentulous jaws.
- Temporomandibular joint disorders – TMJ disorders and their sequelae need expert evaluation, assessment and management. It is preferable to be familiar with diagnostic and therapeutic arthroscopic surgery procedures.
- Tissue grafting – Understanding of the biological mechanisms involved in autogenous and heterogeneous tissue grafting.
- Reconstructive oral and maxillofacial surgery – hard tissue and soft tissue reconstruction.
- Cyst and tumors of head and neck region and their management – including principles of tumor surgery, giant cell lesion of jaw bones, fibro osseous lesions of jaw.

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- Neurological disorders of maxillofacial region-diagnosis and management of Trigeminal Neuralgia, MPDS, Bells palsy, Frey's Syndrome, Nerve injuries
- Maxillofacial trauma – basic principles of treatment, primary care, diagnosis and management of hard and soft tissue injuries, Comprehensive management including polytrauma patients
- Assessment of trauma-multiple injuries patient, closed abdominal and chest injuries, penetrating injuries, pelvic fractures, urological injuries, vascular injuries.
- Orthognathic surgery – The trainee must be familiar with the assessment and correcting of jaw deformities
- Laser surgery – The application of laser technology in the surgical treatment of lesions amenable to such therapy
- Distraction osteogenesis in maxillofacial region.
- Cryosurgeries – Principles, the application of cryosurgery in the surgical management of lesions amenable to such surgeries.
- Cleft lip and palate surgery- detailed knowledge of the development of the face, head and neck, diagnosis and treatment planning, Current concepts in the management of cleft lip and palate deformity, knowledge of nasal endoscopy and other diagnostic techniques in the evaluation of speech and hearing, concept of multi disciplinary team management.
- Aesthetic facial surgery – detailed knowledge of structures of face & neck including skin and underlying soft tissues, diagnosis and treatment planning of deformities and conditions affecting facial skin, underlying facial muscles, bone, eyelids, external ear etc., surgical management of post acne scaring, face lift, blepharoplasty, otoplasty, facial bone recountouring etc.
- Craniofacial surgery – basic knowledge of developmental anomalies of face, head and neck, basics concept in the diagnosis and planning of various head and neck anomalies including facial cleft, craniosynostosis, syndromes, etc., Current concepts in the management of craniofacial anomalies.
- Head and neck oncology – understanding of the principles of management of head and neck oncology including various pre cancerous lesions, Experience in the surgical techniques of reconstruction following ablative surgery.
- Micro vascular surgery.
- Implantology – principles, surgical procedures for insertion of various types of implants.
- Maxillofacial radiology/ radio diagnosis
- Other diagnostic methods and imaging techniques

C) Allied Specialties:

- General medicine: General assessment of the patient including children with special emphasis on cardiovascular diseases, endocrinal, metabolic respiratory and renal diseases, Blood dyscrasias
- General surgery: Principles of general surgery, exposure to common general surgical procedures.
- Neuro – surgery: Evaluation of a patient with head injury, knowledge & exposure of various Neuro – surgical procedures
- ENT/Ophthalmology: Examination of ear, nose, throat, exposure to ENT surgical procedures, ophthalmic examination and evaluation, exposure to ophthalmic surgical procedures.

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- Orthopedic: basic principles of orthopedic surgery, bone diseases and trauma as relevant to Maxillofacial surgery, interpretation of radiographs, CT, MRI and ultrasound
- Anesthesiology: Evaluation of patients for GA technique, general anesthetic drugs use and complications, management of emergencies, various IV sedation techniques.
- Plastic Surgery- Basic Principles

TEACHING / LEARNING ACTIVITIES:

The post graduate is expected to complete the following at the end of :

I Year

Study ofapplied basic sciences including practicals (wherever necessary), basic computer sciences, exodontia, seminars on basic topics, selection of dissertation topic, library assignment topic, attending O.T, ward rounds, Medical Record keeping, Pre-clinical exercises, preparation of synopsis and its submission within the six months after admission to the university as per calendar of events.

Rotation and postings in other departments:

General medicine	- 1 month
General surgery	- 1 month
Ophthalmology	- 15 days
Neuro Surgery	- 15 days
ENT	- 15 days
Orthopedic	- 15 days
Plastic Surgery	- 15 days
Casualty	- 15 days
Anesthesia (ICU)	- 15 days
Radiology (CT, MRI, USG)	- 15 days

II Year

- Minor oral surgery and higher surgical training
- Submission of library assignment
- Oncologyposting – 1 month

III Year

- Maxillofacial surgery
- Submission of dissertation to the university, six months before the final examination.

It is desirable to enter general surgical skills and operative procedures that are observed, assisted or performed in the log book in the format as given below:-

Sl.No	Procedure	Category	Number
1	Injection I.M. and I.V.	PI	50, 20
2	Minor suturing and removal of sutures	PI	N,A
3	Incision & drainage of an abscess	PI	10
4	Surgical extraction	PI	15
5	Impacted teeth	PI, A	30,20

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6	Pre prosthetic surgery- corrective procedures ridge extension ridge reconstruction	 PI A A	 10 3 3
7	OAF closure	PI, A	3,2
8	Cyst enuleation	PI,A	5,5
9	Mandibular fractures	PI,A	10,10
10	Peri-apical surgery	PI,A	5
11	Infection management	PI,A	3,3
12	Biopsy procedures	PI, A	10, 3
13	Removal of salivary calculi	A	3
14	Benign tumors	A	3,3
15	mid face fractures	PI,A	3,5
16	Implants	PI,A	5,5
17	Tracheotomy	A	2
18	Skin grafts	PI,A	2,2
19	Orthognathic surgery	A,O	3,5
20	Harvesting bone & cartilage grafts Iliac crest Rib Calvarial Fibula	 A,O A,O A,O A,O	 3,5 3,3 2,2 2,2
21	T.M. Joint surgery	A	3
22	Jaw resections	A,O	3,5
23	Onco surgery	A,O	3,3
24	Micro vascular anastomosis	A,O	2,2
25	Cleft lip & palate	A,O	3,5
26	Distraction osteogenesis	A,O	2,3
27	Rhinoplasty	A,O	2,3
28	Access osteotomies and base of skull surgeries	A,O	1,3
29	Emergency Management for OMFS Patients in Casualty / Accident & Emergency	PI,O	5,5

PI:- Performed Independently
A:- Assisted
O:- Observed

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.

Paper wise distribution of syllabus:

PART- I :

Applied Basic Sciences

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PART-II:

Paper– I:Minor Oral Surgery and Maxillofacial Trauma

Minor Oral Surgery:

- **Principles of Surgery**: Developing A Surgical Diagnosis, Basic Necessities For Surgery, Aseptic Technique, Incisions, Flap Design Tissue Handling, Haemostasis, Dead Space Management, Decontamination And Debridement, Suturing, Oedema Control, Patient General Health And Nutrition.
- **Medical Emergencies**: Prevention and management of altered cons-ciousness (syncope, orthostatic hypotension, seizures, diabetes mellitus, adrenal insufficiency), hypersensitivity reactions, chest discomfort, and respiratory difficulty.
- **Examination and Diagnosis**: Clinical history, physical and radiographic, clinical and laboratory diagnosis, oral manifestations of systemic diseases, implications of systemic diseases in surgical patients.
- **Haemorrhage and Shock**: Applied physiology, clinical abnormalities of coagulation, extra vascular hemorrhage, and hemorrhagic lesions, management of secondary hemorrhage, shock.
- **Exodontia**: Principles of extraction, indications and contraindications, types of extraction, complications and their management, principles of elevators and elevators used in oral surgery.
- **Impaction:** Surgical anatomy, classification, indications and contraindications, diagnosis, procedures, complications and their management.
- **Surgical aids to eruption of teeth**: Surgical exposure of unerupted teeth, surgical repositioning of partially erupted teeth.
- **Transplantation of teetH**
- **Surgical Endodontics:** Indications and contraindications, diagnosis, procedures of periradicular surgery
- **Preprosthetic Surgery:** Requirements, types (alvoloplasty, tuberosity reduction, mylohyoid ridge reduction, genial reduction, removal of exostosis, vestibuloplasty)
- **Procedures to Improve Alveolar Soft Tissues**: Hypermobile tissues- operative / sclerosing method, epulis fissuratum, frenectomy and frenotomy
- **Infectionsof Head and Neck:** Odontogenic and non Odontogenic infections, factors affecting spread of infection, diagnosis and differential diagnosis, management of facial space infections, Ludwig angina, cavernous sinus thrombosis.
- **Chronic infections of the jaws:** Osteomyelitis (types, etiology, pathogenesis, management) osteoradionecrosis
- **Maxillary Sinus:** Maxillary sinusitis – types, pathology, treatment, closure of Oro – antral fistula, Caldwell- luc operation
- **Cysts of the Orofacial Region:** Classification, diagnosis, management of OKC, dentigerous, radicular, non Odontogenic, ranula
- **Neurological disorders of the Maxillofacial Region:** Diagnosis and management of trigeminal neuralgia, MPDS, bell's palsy, Frey's syndrome, nerve injuries.
- **Implantology**: Definition, classification, indications and contraindications, advantages and disadvantages, surgical procedure.
- **Anesthesia**
  Local Anesthesia:
  Classification of local anesthetic drugs, mode of action, indications and contra indications, advantages and disadvantages, techniques, complications and their management.

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General Anesthesia:
Classification, stages of GA, mechanism of action, indications, and contra indications, advantages and disadvantages, post anesthetic complications and emergencies, anesthetic for dental procedures in children, pre medication, conscious sedation, legal aspects for GA

Maxillofacial Trauma:

- Surgical Anatomy of Head and Neck.
- Etiology of Injury.
- Basic Principles of Treatment
- Primary Care: resuscitation, establishment of airway, management of hemorrhage, management of head injuries and admission to hospital.
- Diagnosis: clinical, radiological
- Soft Tissue Injury of Face and Scalp: classification and management of soft tissue wounds, injuries to structure requiring special treatment.
- Dento Alveolar Fractures: examination and diagnosis, classification, treatment, prevention.
- Mandibular Fractures: classification, examination and diagnosis, general principles of treatment, complications and their management
- Fracture of Zygomatic Complex: classification, examination and diagnosis, general principles of treatment, complications and their management.
- Orbital Fractures: blow out fractures
- Nasal Fractures
- Fractures of Middle Third of the Facial Skeleton: emergency care, fracture of maxilla, and treatment of le fort I, II, III, fractures of Naso orbito ethmoidal region.
- Opthalmic Injuries: minor injuries, non-perforating injuries, perforating injuries, retro bulbar hemorrhage, and traumatic optic neuropathy.
- Traumatic Injuries To Frontal Sinus: diagnosis, classification, treatment
- Maxillofacial Injuries in Geriatric and Pediatric Patients.
- Gun Shot Wounds and War Injuries
- Osseointegration in Maxillofacial Reconstruction
- Metabolic Response to Trauma: neuro endocrine responses, inflammatory mediators, clinical implications
- Healing of Traumatic Injuries: soft tissues, bone, cartilage, response of peripheral nerve to injury
- Nutritional consideration following Trauma.
- Tracheostomy: indications and contraindications, procedure, complications and their management.

Paper – II :Maxillofacial Surgery

a) Salivary gland

- Sialography
- Salivary fistula and management
- Diseases of salivary gland – developmental disturbances, cysts, inflammation and sialolithiasis
- Mucocele and Ranula
- Tumors of salivary gland and their management
- Staging of salivary gland tumors
- Parotidectomy

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b) Temporomandibular Joint

- Etiology, history signs, symptoms, examination and diagnosis of temporomandibular joint disorders
- Ankylosis and management of the same with different treatment modalities
- MPDS and management
- Condylectomy – different procedures
- Various approaches to TMJ
- Recurrent dislocations – Etiology and Management

c) Oncology

- Biopsy
- Management of pre-malignant tumors of head and neck region
- Benign and Malignant tumors of Head and Neck region
- Staging of oral cancer and tumor markers
- Management of oral cancer
- Radical Neck dissection
- Modes of spread of tumors
- Diagnosis and management of tumors of nasal, paranasal, neck, tongue, cheek, maxilla and mandible
- Radiation therapy in maxillofacial regions
- Lateral neck swellings

d) Orthognathic surgery

- Diagnosis and treatment planning
- Cephalometric analysis
- Model surgery
- Maxillary and mandibular repositioning procedures
- Segmental osteotomies
- Management of apertognathia
- Genioplasty
- Distraction osteogenesis

e) Cysts and tumors of oro facial region

- Odontogenic and non-Odontogenic tumors and their management
- Giant Cell lesions of jawbone
- Fibro osseous lesions of jawbone
- Cysts of jaw

f) Laser surgery

- The application of laser technology in surgical treatment of lesions

g) Cryosurgery

- Principles, applications of cryosurgery in surgical management

h) Cleft lip and palate surgery

- Detailed knowledge of the development of the face, head and neck
- Diagnosis and treatment planning
- Current concepts in the management of cleft lip and palate deformity
- Knowledge of Naso endoscopy and other diagnostic techniques in the evaluation of speech and hearing
- Concept of multidisciplinary team management

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i) Aesthetic facial surgery

- Detailed knowledge of the structures of the face and neck including skin and underlying soft tissue
- Diagnosis and treatment planning of deformities and conditions affecting facial skin
- Underlying facial muscles, bone, Eyelids, external ear
- Surgical management of post acne scarring, facelift, blepharoplasty, otoplasty, facial bone recontouring, etc

j) Craniofacial surgery

- Basic knowledge of developmental anomalies of the face, head and neck
- Basic concepts in the diagnosis and planning of various head and neck anomalies including facial clefts, craniosynostosis, syndromes, etc.
- Current concept in the management of Craniofacial anomalies

Paper – III : Essays (descriptive and analyzing type questions)

Scheme 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 Anatomy, Physiology, & Biochemistry, Pathology, Microbiology, Pharmacology, Research Methodology and Biostatistics.

PART- II

Paper – I : Minor Oral Surgery and Maxillofacial Trauma
Paper – II : Maxillofacial Surgery
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**
1. Minor Oral Surgery	-	100 Marks

Each candidate is required to perform the minor oral surgical procedures under local anaesthesia. The minor surgical cases may include removal of impacted lower third

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molar, cyst enucleation, any similar procedure where students can exhibit their professional skills in raising the flap, removing the bone and suturing the wound.

2.Case presentation and discussion: 100 Marks

(a) One long case - 60 Marks
(b) Two short cases - 40 Marks
(20 marks each)

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: *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.

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4. CONSERVATIVE DENTISTRY AND ENDODONTICS

OBJECTIVES:

The following objectives are laid out to achieve the goals of the course. These are to be achieved by the time the candidate completes the course. These objectives may be considered under the following subtitles.

Knowledge:

At the end of 36 months of training, the candidates should be able to:

- Describe etiology, pathophysiology, periapical diagnosis and management of common restorative situations, endodontic situations that will include contemporary management of dental caries, management of trauma and pulpal pathosis including periodontal situations.
- Demonstrate understanding of basic sciences as relevant to conservative / restorative dentistry and Endodontics.
- Identify social, economic, environmental and emotional determinants in a given case or community and take them into account for planning and execution at individual and community level.
- Ability to master differential diagnosis and recognize conditions that may require multi disciplinary approach or a clinical situation outside the realm of the specialty, which he or she should be able to recognize and refer to appropriate specialist.
- Update himself by self-study and by attending basic and advanced courses, conferences, seminars, and workshops in the specialty of Conservative Dentistry-Endodontics-Dental Materials and Restorative Dentistry.
- Ability to teach/guide, colleagues and other students.
  Use information technology tools and carry out research both basic and clinical with the aim of his publishing his work and presenting the same at scientific platform.

Skills:

- Take proper chair side history, examine the patient and perform medical and dental diagnostic procedures as well as perform relevant tests and interpret to them to come to a reasonable diagnosis about the dental condition in general and Conservative Dentistry – Endodontics in particular. And undertake complete patient monitoring including preoperative as well as post operative care of the patient.
- Perform all levels of restorative work, surgical and non-surgical Endodontics as well as endodontic-periodontal surgical procedures as part of multidisciplinary approach to clinical condition.
- Provide basic life saving support in emergency situations.
- Manage acute pulpal and pulpo periodontal situations.
- Have a thorough knowledge of infection control measures in the dental clinical environment and laboratories.
- Should have proper knowledge of sterilization procedures

Human Values, Ethical Practice and Communication Abilities

- Adopt ethical principles in all aspects of restorative and contemporary Endodontics including non-surgical and surgical Endodontics.
- Professional honesty and integrity should be the top priority.
- Dental care has to be provided regardless of social status, caste, creed or religion of the patient.
- Develop communication skills in particular to explain various options available for management and to obtain a true informed consent from the patient.
- Apply high moral and ethical standards while carrying on human or animal research.

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- He/She shall not carry out any heroic procedures and must know his limitations in performing all aspects of restorative dentistry including Endodontics. Ask for help from colleagues or seniors when required without hesitation.
- Respect patient's rights and privileges including patients right to information.

COURSE CONTENTS:

PART-I:

Applied Basic Sciences:

Applied Anatomy of Head and Neck:

- Development of face, paranasal sinuses and the associated structures and their anomalies, cranial and facial bones, TMJ anatomy and function, arterial and venous drainage of head and neck, muscles of face and neck including muscles of mastication and deglutition, brief consideration of structures and function of brain. Brief consideration of all cranial nerves and autonomic nervous system of head and neck. Salivary glands, Functional anatomy of mastication, deglutition and speech. Detailed anatomy of deciduous and permanent teeth, general consideration in physiology of permanent dentition, form, function, alignment, contact, occlusion.
- Internal anatomy of permanent teeth and its significance.
- Applied histology – histology of skin, oral mucosa, connective tissue, bone, cartilage, blood vessels, lymphatics, nerves, muscles, tongue.

Anatomy and Development of Teeth:

- Enamel – development and composition, physical characteristics, chemical properties, structure.
- Age changes – clinical structure.
- Dentin – development, physical and chemical properties, structure type of dentin, innervations, age and functional changes and clinical considerations.
- Pulp – development, histological structures, innervations, functions, regressive changes, clinical considerations.
- Dentin and pulp complex.
- Cementum – composition, cementogenesis, structure, function, clinical considerations.
- Knowledge of internal anatomy of permanent teeth, anatomy of root apex and its implications in endodontic treatment.
- Periodontal ligament – development, structure, function and clinical considerations.
- Salivary glands – structure, function, clinical considerations.

Applied Physiology:

- Mastication, deglutition, digestion and assimilation, fluid and electrolyte balance.
- Blood composition, volume, function, blood groups, haemostasis, coagulation, blood transfusion, circulation, heart, pulse, blood pressure, shock, respiration-control, anoxia, hypoxia, asphyxia, artificial respiration, and endocrinology – general principles of endocrine activity and disorders relating to pituitary, thyroid, parathyroid, adrenals including pregnancy and lactation.
- Physiology of saliva – composition, function, clinical significance.
- Clinical significance of vitamins, diet and nutrition – balanced diet.
- Physiology of pain, sympathetic and Para sympathetic nervous system, pain pathways, physiology of pulpal pain, Odontogenic and non Odontogenic pain, pain disorders – typical and atypical.
- Biochemistry such as osmotic pressure, electrolytic dissociation, oxidation, reduction etc. Carbohydrates, proteins, lipids and their metabolism, nucleoproteins, nucleic acid and

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their metabolism. Enzymes, vitamins and minerals, metabolism of inorganic elements, detoxification in the body, anti metabolites, chemistry of blood lymph and urine.

Pathology:

- Inflammation, repair, degeneration, necrosis and gangrene.
- Circulatory disturbances – ischemia, hyperemia, edema, thrombosis, embolism, infarction, allergy and hypersensitivity reaction.
- Neoplasms – classifications of tumors, characteristics of benign and malignant tumors, spread of tumors.
- Blood dyscrasias.
- Developmental disturbances of oral and Para oral structures, dental caries, regressive changes of teeth, pulp, periapical pathology, pulp reaction to dental caries and dental procedures.
- Bacterial, viral, mycotic infections of the oral cavity.

Microbiology:

- Pathways of pulpal infection, oral flora and micro organisms associated with endodontic diseases, pathogenesis, host defense, bacterial virulence factors, healing, theory of focal infections, microbes relevance to dentistry – strepto, staphylococci, lactobacilli, cornyebacterium, actinomycetes, clostridium, neisseria, vibrio, bacteriods, fusobacteria, spirochetes, mycobacterium, virus and fungi.
- Cross infection, infection control, infection control procedure, sterilization and disinfection.
- Immunology – antigen antibody reaction, allergy, hypersensitivity and anaphylaxis, auto immunity, grafts, viral hepatitis, HIV infections and aids. Identification and isolation of microorganisms from infected root canals. Culture medium and culturing technique (Aerobic and anaerobic interpretation and antibiotic sensitivity test).

Pharmacology:

- Dosage and route of administration of drugs, actions and fate of drug in body, drug addiction, tolerance of hypersensitivity reactions.
- Local anesthesia – agents and chemistry, pharmacological actions, fate and metabolism of anaesthetic, ideal properties, techniques and complications.
- General anesthesia – pre medications, neuro muscular blocking agents, induction agents, inhalation anesthesia, and agents used, assessment of anesthetic problems in medically compromised patients.
- Anaesthetic emergencies
- Antihistamines, corticosteroids, chemotherapeutic and antibiotics, drug resistance, haemostasis, and haemostatic agents, anticoagulants, sympathomimitic drugs, vitamins and minerals (A, B, C, D, E, K IRON), anti sialogogue, immunosupressants, drug interactions, antiseptics, disinfectants, anti viral agents, drugs acting on CNS.

Biostatistics:

- Introduction, Basic concepts, Sampling, Health information systems – collection, compilation, presentation of data. Elementary statistical methods – presentation of statistical data, Statistical averages – measures of central tendency, measures of dispersion, Normal distribution. Tests of significance – parametric and non – parametric tests (Fisher extract test, Sign test, Median test, Mann Whitney test, Kruskal Wallis one way analysis, Friedmann two way analysis, ANOVA, Regression analysis), Correlation and regression,Use of computers.

Research Methodology:

- Essential features of a protocol for research in humans
- Experimental and non-experimental study designs

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- Ethical considerations of research

Applied Dental Materials:

- Physical and mechanical properties of dental materials, biocompatibility.
- Impression materials, detailed study of various restorative materials, restorative resin and recent advances in composite resins, bonding- recent developments, tarnish and corrosion, dental amalgam, direct filling gold, casting alloys, inlay wax, die materials, investments, casting procedures, defects, dental cements for restoration and pulp protection (luting, liners, bases) cavity varnishes.
- Dental ceramics-recent advances, finishing and polishing materials.
- Dental burs – design and mechanics of cutting – other modalities of tooth preparation. Methods of testing biocompatibility of materials used.

PART-II:

Paper-I: Conservative Dentistry

1. Examination, diagnosis and treatment plan
2. Occlusion as related to conservative dentistry, contact, contour, its significance. Separation of teeth, matrices, used in conservative dentistry.
3. Dental caries- epidemiology, recent concept of etiological factors, pathophysiology, histopathology, diagnosis, caries activity tests, prevention of dental caries and management – recent methods.
4. Hand and rotary cutting instruments, development of rotary equipment, speed ranges, hazards.
5. Dental burs and other modalities of tooth reparation- recent developments (air abrasions, lasers etc.)
6. Infection control procedures in conservative dentistry, isolation equipments etc.
7. Direct concepts in tooth preparation for amalgam, composite, GIC and restorative techniques, failures and management.
8. Biologic response of pulp to various restorative materials and operative procedures.
9. Direct and indirect composite restorations.
10. Indirect tooth colored restorations- ceramic, inlays and onlays, veneers, crowns, recent advances in fabrication and gingival tissue management.
11. Impression procedures used for indirect restorations.
12. Cast metal restorations, indications, contraindications, tooth preparation for class II inlay, onlay, full crown restorations.
    Restorative techniques, direct and indirect methods of fabrication including materials used for fabrication like inlay wax, investment materials and casting.
13. Direct gold restorations.
14. Recent advances in restorative materials.
15. Esthetics including smile design
16. Management of non-carious lesions.
17. Management of discolored tooth
18. Minimal intervention dentistry.
19. Recent advances in restoration of endodontically treated teeth and grossly mutilated teeth.
20. Hypersensitivity-theories, causes and management.
21. Lasers in Conservative Dentistry.
22. CAD-CAM in restorative dentistry.
23. Digital imaging and its applications in restorative dentistry.
24. Clinical Photography.

Paper-II: Endodontics

1. Rationale of endodontics.

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2. Pulp and periapical pathology.
3. Pathobiology of periapex.
4. Diagnostic procedures – Orofacial dental pain emergencies: endodontic diagnosis and management, recent advances used for diagnosis.
5. Case selection and treatment planning.
6. Endodontic microbiology.
7. Infection control procedures used in Endodontics (aseptic techniques such as rubber dam, sterilization of instruments etc.)
8. Endodontic emergencies and management.
9. Access cavity preparation – objectives and principles
10. Endodontic instruments and instrumentation – recent developments, detailed description of hand, rotary, sonic, ultra sonic etc.
11. Working length determination, cleaning and shaping of root canal system and recent developments in techniques of canal preparation.
12. Root canal irrigants and intra canal medicaments.
13. Obturation materials, techniques and recent advances.
14. Traumatic injuries and management – endodontic treatment for young permanent teeth.
15. Endodontic surgeries, recent developments in technique and devices and wound healing.
16. Endoperio interrelationship and management.
17. Lasers in Endodontics.
18. Multidisciplinary approach to endodontic situations.
19. Radiology and CBCT in endodontic practice.
20. Procedural errors in endodontics and their management.
21. Endodontic failures and retreatment.
22. Resorptions and its management.
23. Microscopes and Microsurgery in endodontics.
24. Single visit endodontics, current concepts and controversies.
25. Regenerative Endodontics

Paper-III: Essays (descriptive and analyzing type questions)

TEACHING / LEARNING ACTIVITIES:

The post graduate is expected to complete the following at the end of :

The following is the minimum required to be completed before the candidate can be considered eligible to appear for final MDS exam.

First Year

- **Pre Clinical Work – Conservative and Endodontics**
- **Preclinical work on typhodont teeth**

1. Class II amalgam cavities
   a. Conservative preparation - 03
   b. Conventional preparation - 03
2. Inlay cavity preparation including wax pattern and casting on premolars and molars – MO, DO, MOD - 02
3. Onlay preparation on molars including wax pattern and casting - 02
4. Full Crown

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a. Anterior - 02
b. Posterior - 02
(1 each to be processed)

- **Pre Clinical work on natural teeth**

1. Wax Carving of all permanent teeth
2. Inlay on molars and premolars MO, DO, and MOD including wax pattern and casting - 05
3. Amalgam cavity preparation
   a. Conventional - 02
   b. Conservative - 02
4. Complex amalgam on molar teeth - 02
5. Onlay on molars including wax pattern and casting - 02
   (1 to be processed)
6. Full crown premolars and molars (metal, PFM & Ceramic) - 04
7. Full crown anterior (PFM, composite& Ceramic) - 03
8. Veneers anterior teeth - 02
9. Composite
   a. Composite Filling (Class I,II,III & V) -05 (each)
   b. Inlay (Class I & II) -02
   c. Veneer -02
   d. Diastema Closure -02
   e. Angle Buildups -02

Endodontics:

1. Sectioning of all maxillary and mandibular teeth (vertical & horizontal).
2. Access cavity opening in relation to maxillary and mandibular permanent teeth.
3. Access cavity preparation, BMP and Obturation
   a) Anterior (3 maxillary and 3 mandibular) - 06
      - Conventional prep - 02
      - Step back - 02
      - Crown down - 02
      - Obturation - 03
      (2 lateral compaction and 1 thermoplasticized)
   b) Premolar - 04
      (2 upper and 2 lower) obturation 1 each
   c) Molar - 06
      (3 upper – 2 first molars and 1 second molar
      3 lower – 2 first molars and 1 second molar) obturation 1 each
4. Post and core preparation and fabrication in relation to anterior and posterior teeth
   a. Anterior 10 (Cast Post 5 and prefabricated post 5)
   b. Posterior 05 (Cast Post 2 and prefabricated post 5)
5. Removable dies - 04

Note : Technique work to be completed in the first four months

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Clinical Work:

A	Composite restorations	30
B	GIC Restorations	30

C	Complex amalgam restorations	05
D	Composite inlay + veneers (direct and indirect)	10
E	Ceramic jacket crowns	05
F	Post and core for anterior teeth	10
G	Bleaching vital	05
	Non vital	05
H	RCT Anterior	20
I	Endo surgery – observation and assisting	05

Presentation of:

- Seminars – 5 seminars by each student – should include topics in dental materials, conservative dentistry and endodontics
- Journal clubs – 5 by each student
- Submission of synopsis at the end of 6 months
- Library assignment work
- Internal assessment – theory and clinicals.

Second Year
Case discussion- 5

1	Ceramic jacket crowns	10
2	Post and core for anterior teeth	10
3	Post and core for posterior teeth	05
4	Composite restoration	15
5	Full crown for posterior teeth	15
6	Cast gold inlay	05
7	Other special types of work such as splinting - Reattachment of fractured teeth etc.	10
8	Anterior RCT	30
9	Posterior RCT	40
10	Endo surgery performed independently	05
11	Management of endo – Perio problems	05
12	Angle build up composite	05
13	Diastema closure	05
14	Composite Veneers	05

- Under graduate teaching program as allotted by the HOD
- Seminars – 5 by each student
- Journal club – 5 by each student
- Dissertation work
- Prepare scientific paper / poster and present in conference and clinical meeting
- Library assignment to be submitted 18 months after starting of the course
- Internal assessment – theory and clinical

Third Year

Dissertation work to be submitted 6 months before final examination.

Clinical work

- Cast gold inlay- Onlay, cuspal restoration 10
- Post and core 20
- Molar endodontics 50
- Endo surgery 05
- Diastema Closure 05

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- Angle Build up 05
- All other types of surgeries including crown lengthening, perioesthetics, hemi sectioning, splinting, replantation.

Presentation of:

- Seminars – 5 by each student
- Journal club – 5 by each student
- Under graduate teaching program as allotted by the HOD
- Internal assessment – theory and clinical

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 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: 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 Anatomy, Physiology, Pathology including Oral Microbiology, Pharmacology, Biostatistics and Research Methodology and Applied Dental Materials.

PART-II

Paper-I : Conservative Dentistry
Paper-II : Endodontics
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

The duration of Clinical and Viva Voce examination will be 2 days for a batch of four students. If the number of candidates exceeds 4, the programme can be extended to 3rd day.

Day 1

Clinical Exercise I – Random case discussion – (2) - 10+10 Marks

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(Diagnosis, Treatment, Planning & Discussion)

Cast core preparation		
(i) Tooth Preparation	-	20 marks
(ii) Direct Wax Pattern	-	10 marks
(iii) Casting	-	10 marks
(iv) Cementation	-	05 marks
(v) Retraction & Elastomeric Impression	-	05 marks
Clinical Exercise II	**-**	**30 Marks**
(Inlay Exercise)		
(i) Tooth preparation for Class II Inlay (Gold or Esthetic)	-	20 marks
(ii) Fabrication of Indirect Pattern	-	10 marks
Day 2		
Clinical Exercise III	**-**	**100 Marks**
(Molar Endodontics)		
(i) Local Anaesthesia and Rubber Dam application	-	20 marks
(ii) Access Cavity	-	20 marks
(iii) Working length determination	-	20 marks
(iv) Canal Preparation	-	20 marks
(v) Master cone selection	-	20 marks

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.

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5. ORTHODONTICS AND DENTOFACIAL ORTHOPEDICS

OBJECTIVES:

The training programme in Orthodontics is to structure and achieve the following four objectives

Knowledge:

1. The dynamic interaction of biologic processes and mechanical forces acting on the stomatognathic system during orthodontic treatment
2. The etiology, pathophysiology, diagnosis and treatment planning of various common Orthodontic problems
3. Various treatment modalities in Orthodontics – preventive, interceptive and corrective.
4. Basic sciences relevant to the practice of Orthodontics
5. Interaction of social, cultural, economic, genetic and environmental factors and their relevance to management of oro – facial deformities
6. Factors affecting the long-range stability of orthodontic correction and their management
7. Personal hygiene and infection control, prevention of cross infection and safe disposal of hospital waste, keeping in view the high prevalence of Hepatitis and HIV and other highly contagious diseases.

Skills:

1. To obtain proper clinical history, methodical examination of the patient, perform essential diagnostic procedures, and interpret them and arrive at a reasonable diagnosis about the Dento-facial deformities.
2. To be competent to fabricate and manage the most appropriate appliance – intra or extra oral, removable or fixed, mechanical or functional, and active or passive – for the treatment of any orthodontic problem to be treated singly or as a part of multidisciplinary treatment of oro-facial deformities.

Attitude:

1. Develop an attitude to adopt ethical principles in all aspects of Orthodontic practice.
2. Professional honesty and integrity are to be fostered
3. Treatment care is to be delivered irrespective of the social status, cast, creed and religion of the patients.
4. Willingness to share the knowledge and clinical experience with professional colleagues
5. Willingness to adopt, after a critical assessment, new methods and techniques of orthodontic management developed from time to time based on scientific research, which are in the best interest of the patient
6. Respect patients' rights and privileges, including patients right to information and right to seek a second opinion
7. Develop attitude to seek opinion from allied medical and dental specialists as and when required

Communication Skills:

1. Develop adequate communication skills particularly with the patients giving them the various options available to manage a particular Dento-facial problem and to obtain a true informed consent from them for the most appropriate treatment available at that point of time.
2. Develop the ability to communicate with professional colleagues, in Orthodontics or other specialties through various media like correspondence, Internet, e-video, conference, etc. to render the best possible treatment.

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COURSE CONTENT:

The program outlined, addresses both the knowledge needed in Orthodontics and allied Medical specialties in its scope.

Spread of the Curriculum:

PART-I:

A. Applied Basic Sciences:

Applied Anatomy:

a. Prenatal growth of head:
   Stages of embryonic development, origin of head, origin of face, origin of teeth.
b. Postnatal growth of head:
   Bones of skull, the oral cavity, development of chin, the hyoid bone, general growth of head, growth of the face.
c. Bone growth:
   Origin of bone, composition of bone, units of bone structure, schedule of Ossification, mechanical properties of bone, roentgen graphic appearance of bone
d. Assessment of growth and development:
   Growth prediction, growth spurts, the concept of normality and growth increments of growth, differential growth, gradient of growth, methods of gathering growth data. Theories of growth and recent advances, factors affecting physical growth.
e. Muscles of mastication:
   Development of muscles, muscle change during growth, muscle function and facial development, muscle function and malocclusion
f. Development of dentition and occlusion:
   Dental development periods, order of tooth eruption, chronology of permanent tooth formation, periods of occlusal development, pattern of occlusion.
g. Assessment of skeletal age.

Physiology:

a. Endocrinology and its disorders:
   Growth hormone, thyroid hormone, parathyroid hormone, ACTH.
b. Calcium and its metabolism:
c. Nutrition-metabolism and their disorders:
   Proteins, carbohydrates, fats, vitamins and minerals
d. Muscle physiology:
e. Craniofacial Biology:
   Adhesion molecules and mechanism of adhesion
f. Bleeding disorders in orthodontics: Hemophilia

Dental Materials:

a. Gypsum products:
   Dental plaster, dental stone and their properties, setting reaction etc.
b. Impression materials:
   Impression materials in general and particularly of alginate impression material.
c. Acrylics:
   Chemistry, composition physical properties

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d. Composites:
   Composition types, properties, setting reaction
e. Banding and bonding cements:
f. Wrought metal alloys:
   Deformation, strain hardening, annealing, recovery, recrystallization, grain growth, properties of metal alloys
g. Orthodontic arch wires
h. Elastics:
   Latex and non-latex elastics.
i. Applied physics, Bioengineering and metallurgy:
j. Specification and tests methods used for materials used in Orthodontics:
k. Survey of all contemporary literature and recent advances in above mentioned materials:

Genetics:

a. Cell structure, DNA, RNA, protein synthesis, cell division
b. Chromosomal abnormalities
c. Principles of orofacial genetics
d. Genetics in malocclusion
e. Molecular basis of genetics
f. Studies related to malocclusion
g. Recent advances in genetics related to malocclusion
h. Genetic counseling
i. Bioethics and relationship to Orthodontic management of patients.

Physical Anthropology:

a. Evolutionary development of dentition
b. Evolutionary development of jaws.

Pathology:

a. Inflammation
b. Necrosis

Biostatistics:

a. Statistical principles
   - Data Collection
   - Method of presentation
   - Method of Summarizing
   - Methods of analysis – different tests/errors
b. Sampling and Sampling technique
c. Experimental models, design and interpretation
d. Development of skills for preparing clear concise and cognent scientific abstracts and publication

Applied Research Methodology In Orthodontics:

a. Experimental design
b. Animal experimental protocol
c. Principles in the development, execution and interpretation of methodologies in Orthodontics
d. Critical Scientific appraisal of literature.

Applied Pharmacology

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Definitions & terminologies used – Dosage and mode of administration of drugs. Action and fate of drugs in the body, Drug addiction, tolerance and hypersensitive reactions, Drugs acting on the central nervous system, general anesthetics hypnotics, analeptics and tranquilizers. Local anesthetics, Chemotherapeutics and antibiotics. Vitamins: A, D, B – complex group, C & K etc.

PART-II:

Paper-I:Basic Orthodontics

OrthodonticHistory:

a. Historical perspective,
b. Evolution of orthodontic appliances,
c. Pencil sketch history of Orthodontic peers
d. History of Orthodontics in India

Concepts of Occlusion and Esthetics:

a. Structure and function of all anatomic components of occlusion,
b. Mechanics of articulation,
c. Recording of masticatory function,
d. Diagnosis of Occlusal dysfunction,
e. Relationship of TMJ anatomy and pathology and related neuromuscular physiology.

Etiology and Classification of Malocclusion:

a. A comprehensive review of the local and systemic factors in the causation of malocclusion
b. Various classifications of malocclusion

Dentofacial Anomalies:

a. Anatomical, physiological and pathological characteristics of major groups of developmental defects of the orofacial structures.

Diagnostic Procedures and Treatment Planning in Orthodontics:

a. Emphasis on the process of data gathering, synthesis and translating it into a treatment plan
b. Problem cases – analysis of cases and its management
c. Adult cases, handicapped and mentally retarded cases and their special problems
d. Critique of treated cases.

Cephalometrics

a. Instrumentation
b. Image processing
c. Tracing and analysis of errors and applications
d. Radiation hazards
e. Advanced Cephalometrics techniques including digital cephalometrics
f. Comprehensive review of literature
g. Video imaging principles and application.

Practice Management in Orthodontics:

a. Economics and dynamics of solo and group practices
b. Personal management
c. Materials management
d. Public relations

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e. Professional relationship
f. Dental ethics and jurisprudence
g. Office sterilization procedures
h. Community based Orthodontics.

Paper-II:Clinical Orthodontics

Myofunctional Orthodontics:

a. Basic principles
b. Contemporary appliances –design, manipulation and management
c. Case selection and evaluation of the treatment results
d. Review of the current literature.

Dentofacial Orthopedics:

a. Principles
b. Biomechanics
c. Appliance design and manipulation
d. Review of contemporary literature

Cleft lip and palate rehabilitation:

a. Diagnosis and treatment planning
b. Mechanotherapy
c. Special growth problems of cleft cases
d. Speech physiology, pathology and elements of therapy as applied to orthodontics
e. Team rehabilitative procedures.

Biology of tooth movement:

a. Principles of tooth movement-review
b. Review of contemporary literature
c. Applied histophysiology of bone, periodontal ligament
d. Molecular and ultra cellular consideration in tooth movement

Orthodontic / Orthognathic surgery:

a. Orthodontist's role in conjoint diagnosis and treatment planning
b. Pre and post-surgical Orthodontics
c. Participation in actual clinical cases, progress evaluation and post retention study
d. Review of current literature

Ortho / Perio / Prostho/Endo inter relationship:

a. Principles of interdisciplinary patient treatment
b. Common problems and their management

Basic principles of mechanotherapy includes removable appliances and fixed appliances:

a. Design
b. Construction
c. Fabrication
d. Management
e. Review of current literature on treatment methods and results

Applied preventive aspects in Orthodontics:

a. Caries and periodontal disease prevention
b. Oral hygiene measures

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c. Clinical procedures

Interceptive Orthodontics:

a. Principles
b. Growth guidance
c. Diagnosis and treatment planning
d. Therapy emphasis on:
   - Dento-facial problems
   - Tooth material discrepancies
   - Minor surgery for Orthodontics

Evidence Based Orthodontics:

Different types of fixed Mechanotherapy:

Orthodontic Management of TMJ problems, sleep-apnoea etc.:

Retention and relapse:

a. Mechanotherapy – special reference to stability of results with various procedures
b. Post retention analysis
c. Review of contemporary literature

Recent Advances :

a. Use of implants
b. Lasers
c. Application of F.E.M.
d. Distraction Osteogenesis
e. Invisible Orthodontics
f. 3D imaging Digital Orthodontics, Virtual Treatment Planning
g. CAD-CAM bracket Customization
h. Robotic Wire Bending
i. Accelerated Orthodontics
   - Surgical
   - Device assisted or mechanical stimulation
   - Biochemical Mediators
j. Lingual Orthodontics

Paper-III: Essays (descriptive and analyzing type questions)

PRE – CLINICAL EXERCISES
(Should be completed within 3 months)

A general outline of the type of exercises is given here:

1. General Wire bending exercises to develop the manual dexterity.
2. Clasps, Bows and springs used in the removable appliances.
3. Soldering and welding exercises.
4. Fabrication of removable, habit breaking, mechanical and functional appliances, also all types of space maintainers and space regainers.
5. Bonwill Hawley Ideal arch preparation.
6. Construction of orthodontic models trimmed and polished.
7. Cephalometric tracing and various Analyses, also superimposition methods –
8. Fixed appliance typodont exercises.

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a) Training shall be imparted in one basic technique i.e. Standard Edgewise / Begg technique or its derivative / Straight wire etc., with adequate exposure to other techniques.
b) Typodont exercise
   - Band making
   - Bracket positioning and placement
   - Different stages in treatment appropriate to technique taught

9. Clinical photography
10. Computerized imaging
11. Preparation of surgical splints, and splints for TMJ problems.
12. Handling of equipment like vacuum forming appliances and hydro solder etc.

Basic Pre-Clinical Exercise Work for the MDS Students:

1. Clasps:

Sl.No	Exercise	No.
1	¾ Clasps	1
2.	Triangular Clasps	1
3.	Adam's clasp	2
4.	Modification of Adam's – With Helix	2
5.	Southend Clasp	1

2. Labial Bows:

Sl.No.	Exercise	No.
1	Short labial bow (upper & lower)	1
2	Long labial bow (upper & lower)	1
3.	Split high labial bow	1

3. Springs:

Sl.No.	Exercise	No.
1	Double cantilever spring	1
2	Coffin spring	1
3	T spring	1

4. Appliances:

Sl.No.	Exercise	No.
1.	Hawley's retention appliance with anterior bite plane	1
2.	Upper Hawley's appliance with posterior bite plane	1
3.	Upper expansion appliance with expansion screw	1
4.	Habit breaking appliance with tongue crib	1
5.	Oral screen and double oral screen	1
6.	Lip bumper	1
7.	Splint for Bruxism	1
8.	Catalans appliance	1
9.	Activator	1
10.	Bionator	1
11.	Frankel-FR 1& 2 appliance	2
12.	Twin block	1
13.	Lingual arch	1
14.	TPA	1

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15.	Quad helix	1
16.	Utility arches	1
17.	Pendulum appliance	1
18.	Canine Retractor**(Marcotte & PG Spring)**	1

5. Soldering exercises:

Sl.No.	Exercise	No.
1	Star/Comb/Christmas tree	1

6. Study model preparation:

7. Model analysis – Mixed and permanent Dentition:

8. Cephalometrics:

Sl.No.	Exercise
1	Lateral cephalogram to be traced in different colors and super imposed to see the accuracy of tracing
2	Vertical and Anterio-Posterior Cephalometric analysis
3	Soft tissue analysis – Holdaway and Burstone
4	Various superimposition methods

9. Basics of Clinical Photography including Digital Photography:

10. Typodont exercises: Begg or P.E.A. method/Basic Edgewise:

Sl.No	Exercise
1	Teeth setting in Class-II division I malocclusion with maxillary anterior Proclination and mandibular anterior crowding
2	Band pinching, welding brackets and buccal tubes to the bands
3	Different Stages dependent on the applied technique

CLINICAL WORK:

Once the basic pre-clinical work is completed in three months, the students can take up clinical cases and the clinical training.

Each postgraduate student should start with a minimum of 50 fixed orthodontics cases and 20 removable including myofunctional cases of his/her own. Additionally he/she should handle a minimum of 25 transferred cases.

The type of cases can be as follows:

- Removable active appliances
- Class-I malocclusion with Crowding
- Class-I malocclusion with bi-maxillary protrusion
- Class-II division – 1
- Class-II division – 2
- Class-III (Orthopedic, Surgical, Orthodontic cases)
- Inter disciplinary cases
- Removable functional appliance cases like activator, Bionator, functional regulator, twin block and new developments
- Fixed functional appliances – Herbst appliance, jasper jumper etc
- Dento-facial orthopedic appliances like head gears, rapid maxillary expansion, NiTi expander etc.,
- Appliance for arch development such as molar distalization

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- Fixed mechano therapy cases (Begg, PEA, Tip edge, Edgewise, lingual)
- Retention procedures of above treated cases.

Scheme 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 anatomy, Physiology, Dental Materials, Genetics, Pathology, Physical Anthropology, Applied Research methodology, Bio-Statistics and Applied Pharmacology.

PART-II

Paper I: Orthodontic history, Concepts of occlusion and esthetics, Child and Adult Psychology, Etiology and classification of maloclusion, Dentofacial Anomalies, Diagnostic procedures and treatment planning in Orthodontics, Practice management in Orthodontics

Paper II : Clinical Orthodontics

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

Exercise No: 1 **50 Marks**
Functional Case :
Selection of case for functional appliance and recording of construction bite.
Fabrication and delivery of the appliance the next day.

Exercise No: 2 : **50 Marks**
1. III stage with auxiliary springs/Wire bending of any stage of fixed orthodontics
(OR)
2. Bonding of SWA brackets and construction of suitable arch wire.

Exercise No. 3 **75 Marks**
Display of records of the treated cases
(Minimum of 5 cases)

Exercise No: 4 **25 Marks**
Long case discussions

Time allotted for each exercise:

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No	Exercise	Marks allotted	Approximate Time
1	Functional appliance	50	1 hour (each day)
2	III stage mechanics / Bonding and arch wire fabrication	50	1 hr 30 min
3	Display of case records (a minimum of 5 cases to be presented along with all the patients and records)	75	1 hour
4	Long cases	25	2 hours

Note: The complete records of all the cases should be displayed (including transferred cases)

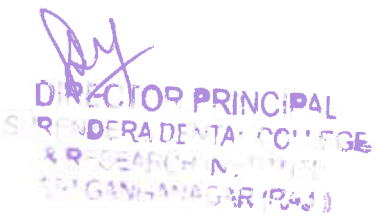
C. Viva Voce : 100 Marks

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.



6. ORAL & MAXILLOFACIAL PATHOLOGY AND ORAL MICROBIOLOGY

Objectives:

- To train a post graduate dental surgeon so as to ensure higher competence in both general and special pathology dealing with the nature of oral diseases, their causes, processes and effects.
- An oral pathologist is expected to perform routine histopathological evaluation of specimens relating to oral and perioral tissues, to carry out routine diagnostic procedures including hematological, cytological, microbiological, Immunological and ultra structural investigations.
- He/she is expected to have an understanding of current research methodology, collection and interpretation of data, ability to carry out research projects on clinical and or epidemiological aspects, a working knowledge on current databases, automated data retrieval systems, referencing and skill in writing scientific papers.
- He/she is expected to present scientific data pertaining to the field, in conferences both as poster and verbal presentations and totake part in group discussions.

Teaching / Learning Activities:

Broad Outline of Theoretical, Clinical and Practical Courses

I MDS:

1. ***Biostatistics and Research Methodology*:**
   - Basic principles of biostatistics and study as applied to dentistry and research
   - Collection/ organization of data/ measurement scales / presentation of data and analysis
   - Measures of central tendency
   - Measures of variability
   - Sampling and planning of health survey
   - Probability, normal distribution & indicative statistics
   - Estimating population values
   - Tests of significance(parametric/non-parametric qualitative methods)
   - Analysis of variance
   - Association, correlation and regression

   Approach:

   - Didactic Lectures

2. **Applied Gross Anatomy of head and neck, histology and genetics :**
   - Temporo-mandibular joint
   - Trigeminal nerve and facial nerve
   - Muscles of mastication
   - Tongue
   - Salivary glands
   - Nerve supply, blood supply, lymphatic drainage & venous drainage of oro-dental tissues
   - Development of face, palate, mandible, maxilla, tongue and applied aspects of the same
   - Development of teeth & dental tissues and developmental defects of oral and maxilla-facial region & abnormalities of teeth
   - Maxillary sinus
   - Jaw muscles and facial muscles

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- Introduction to genetics
- Modes of inheritance
- Chromosomal anomalies of oral tissues & single gene disorders

Approach:

- Didactic Lectures
- Postings in the Department of Anatomy for dissection of Head, Face and Neck

3. ***Physiology (General & Oral)*** :

- Saliva
- Pain
- Mastication
- Taste
- Deglutition
- Wound healing
- Vitamins (influence on growth, development and structure of oral soft and hard tissues & paraoral tissues)
- Calcium metabolism
- Theories of mineralization
- Tooth eruption and shedding
- Blood and its constituents
- Hormones (influence on growth, development and structure of oral soft and hard tissues & paraoral tissues)

Approach:

- Didactic Lectures

4. ***Cell Biology*** :

- Cell structure and function (ultra structural & molecular aspects)
- Intercellular junctions
- Cell cycle and division
- Cell cycle regulators
- Cell–cell & cell-extracellular matrix interactions
- Detailed molecular aspects of DNA,RNA and intracellular organelles, transcription and translation and molecular biology techniques

Approach:

- Seminars & Didactic Lectures

5. ***General Histology*** :

- Light & electron microscopy considerations of epithelial tissues and glands,bone.
- Light & electron microscopy considerations of hemopoetic system, lymphatic system, muscle, neural tissue, endocrinal system (thyroid, pituitary, parathyroid)

Approach:

- Didactic Lectures
- Postings in the Department of Anatomy & Histology for slide discussion
- Record book to be maintained

6. **Biochemistry** :

- Chemistry of carbohydrates, lipids and proteins

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- Methods of identification and purification
- Metabolism of carbohydrates, lipids and proteins
- Biological oxidation
- Various techniques-cell fractionation and ultra filtration, centrifugation, electrophoresis, spectrophotometry and radioactive techniques

Approach:

- Didactic Lectures
- Postings in the Department of Biochemistry to familiarize with various techniques
- Record book to be maintained

7. General Pathology :

- Inflammation and chemical mediator
- Thrombosis
- Embolism
- Necrosis
- Repair
- Degeneration
- Shock
- Hemorrhage
- Pathogenic mechanisms at molecular level
- Blood dyscrasias
- Carcinogenesis and neoplasia

Approach:

- Didactic Lectures & Seminars

8. General Microbiology :

- Definitions of various types of infections
- Routes of infection and spread
- Sterilization ,disinfection and antiseptics
- Bacterial genetics
- Physiology, growth of microorganisms

Approach:

- Didactic Lectures & Seminars

9. Basic Immunology :

- Basic principles of immunity, antigen and antibody reaction
- Cell mediated and humoral immunity
- Immunology of hypersensitivity
- Immunological basis of auto immune phenomena
- Immunodeficiency with relevance to opportunistic infections
- Basic principles of transplantation and tumor immunity

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Approach:

- Didactic Lectures & Seminars

10. Systemic Microbiology / Applied Microbiology :

Morphology, classification, pathogenicity, mode of transmission, methods of prevention, collection and transport of specimen for laboratory diagnosis, staining methods, common culture media, interpretation of laboratory reports and antibiotic sensitivity tests.

- Staphylococci
- Streptococci
- Corynebacterium diphtheria
- Mycobacteria
- Clostridia, bacteroids & fusobacteria
- Actinomycetales
- Spirochetes
- General structure, broad classification of viruses, pathogenesis, pathology of viral infections
- Herpes virus
- Hepatitis virus
- HIV
- General properties of fungi
- Superficial, subcutaneous, deep opportunistic infections
- General principles of fungal infections, method of collection of samples, diagnosis and examination of fungi

Approach:

- Didactic Lectures & Seminars
- Postings in the Department of Microbiology to familiarize with relevant diagnostic methods
- Record book to be maintained

11. Oral biology (Oral and Dental Histology) :

- Study of morphology of permanent and deciduous teeth
- Structure and function of oral, dental and paraoral tissues including their ultra structure, molecular and biochemical aspects

Approach:

- Didactic Lectures & Seminars
- Slide discussion on histological appearance of normal oral tissues
- Record book to be maintained

12. Basic Histo-Techniques and Microscopy :

- Routine hematological tests and clinical significance of the same
- Biopsy procedures for oral lesions
- Tissue processing
- Microtome and principles of microtomy
- Various stains used in histopathology and their applications
- Microscope, principles and theories of microscopy
- Light microscopy and various other types including electron microscopy
- Fixation and fixatives
- Ground sections and decalcified sections
- Cytological smears

Approach:

- Didactic Lectures & Seminars
- Postings in Clinical Pathology and Microbiology for relevant training
- Preparation of Ground and decalcified sections, tissue processing, sectioning and staining
- Tooth Carving (Permanent Dentition)
- Record book to be maintained

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II MDS:

1. ***Oral and Dental Pathology:***

- Developmental disorders of oral and paraoral structures
- Potentially malignant disorders
- Benign and malignant tumors of the oral cavity
- Odontogenic cysts and tumors
- Pathology of salivary glands
- Regressive alterations of teeth
- Bacterial, fungal, viral and protozoal infections of the oral cavity
- Dental caries
- Diseases of pulp and periapical region
- Spread of oral infection
- Healing of oral wounds
- Physical and chemical injuries of oral cavity
- Oral aspects of metabolic diseases
- Diseases of bones and joints
- Diseases of skin and mucous membrane
- Diseases of periodontia
- Diseases of blood and blood forming organs
- Diseases of nerves and muscles
- Oro-facial pain
- Immunological diseases of oral cavity including tumor immunology
- Molecular pathology
- Oral Microbiology

Approach:

- Didactic Lectures & Seminars
- Postings in the Department of Dermatology of a Medical College
- Postings in a Cancer Centre

2. ***Basic histo-techniques and microscopy:***

- Enzyme histochemistry
- Principles, techniques and applications of immunofluorescence
- Principles, techniques and applications of immunohistochemistry
- Preparation of frozen sections
- Museum set up
- Quality control
- Animal models

Approach:

- Didactic Lectures & Seminars
- Training to be imparted in the Department or in other institutions having the facility
- Visit to the centre of animal experimentation to be familiarize with laboratory techniques, upkeep and care of animals
- Record book to be maintained

3. **Recent Molecular Techniques:**

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- Basic principles, techniques and applications of –
  - PCR
  - BLOTS
  - Hybridization
  - Recombinant DNA technology
  - Micro array
  - DNA sequencing
  - Cell culture and cloning

Approach:

- Didactic Lectures & Seminars
- Training to be imparted in the Department or in other institutions having the facility
- Record book to be maintained

4. Recording of Case History and Clinico-Pathological Discussions:

Approach:

- Postings in the Department of Oral Medicine, Diagnosis & Radiology
- Record of minimum 10 case histories to be maintained

5. Histopathology – Slide discussion:

- Record book to be maintained

III MDS:

- Forensic odontology
- Giant cell lesions
- Clear cell lesions
- Round cell lesions
- Spindle cell lesions
- Pigmented lesions
- Fibro-osseous lesions
- Mechanism of formation and expansion of cysts of orofacial region
- Mechanism of growth and metastasis of tumors
- Lab diagnosis of bacterial infections
- Lab diagnosis of viral infections
- Lab diagnosis of fungal infections
- Hamartomas
- Phakomatoses
- Vascular tumors of oro-facial region
- Genodermatoses
- Tumor markers
- Histogenesis of salivary gland tumors
- Tumor angiogenesis
- Concept of premalignancy
- Blue cell lesions
- Molecular basics of oral squamous cell carcinoma
- Matrix remodelling in pathological condition
- Etiopathogenesis of developmental defects of teeth
- Viral oncogenesis
- Lesions associated with impacted and missing teeth
- Syndromes affecting oro-facial region
- Hereditary oral defects

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- Techniques to assess the prognosis of neoplastic lesions
- Vesiculo-bullous lesions
- Lymphoreticular malignancy
- Haemopoietic malignancy
- Micronutrients
- Oral aspects of metabolic disorders
- Hormones and oro-maxillofacial lesions
- Matrix metalloproteinases
- Current concepts in HIV related oral diseases
- Current concepts in OSMF
- Epithelial –connective tissue interaction
- Stem cell research

Approach:

- Didactic Lectures & Seminars
- Postings in the Department of Forensic Medicine / Sciences
- Record book to be maintained

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 should be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment is done using checklists that assess various aspects. Checklists are given in Section IV.

Scheme 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. 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 Anatomy, Physiology (General and oral), Cell Biology, General Histology, Biochemistry, General Pathology, General Pharmacology specially related to drug induced oral mucosal lesions, General and systemic Microbiology, Virology, Mycology, Basic Immunology, Oral Biology (Oral and Dental Histology), Biostatistics and Research Methodology

PART-II

Paper-I : Oral pathology, Oral Microbiology & Immunology and Forensic Odontology
Paper-II : Laboratory techniques & Diagnosis and Oral Oncology
Paper-III : Essays (descriptive and analyzing type questions)

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** 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.*

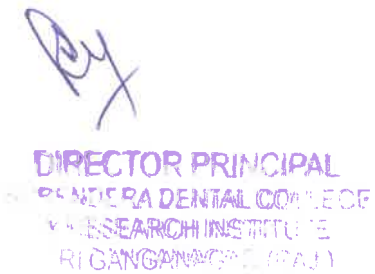
B. Practical/Clinical Examination – 200 Marks

1. **Case Presentation**
   a) Long case – 20 marks
   b) Short case – 10 marks
2. **Clinical Hematology** (any two investigations) – 20 Marks
   Hb%, bleeding time, clotting time, Total WBC count, Differential WBC count and ESR
3. **Smear Presentation** – 20 marks
   Cytology or microbial smear and staining
4. **Paraffin sectioning and H & E Staining** – 30 Marks
5. **Histopathology slide discussion** – 100 Marks

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.

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.



7. PUBLIC HEALTH DENTISTRY

OBJECTIVES:

At the end of 3 years of training the candidate should be able to:

Knowledge:

- Applied basic sciences knowledge regarding etiology, diagnosis and management of the prevention, promotion and treatment of all the oral conditions at the individual and community level.
- Identify social, economic, environmental and emotional determinants in a given individual patient or a community for the purpose of planning and execution of Community Oral Health Program.
- Ability to conduct Oral Health Surveys in order to identify all the oral health problems affecting the community and find solutions using multi – disciplinary approach.
- Ability to act as a consultant in community Oral Health, teach, guide and take part in research (both basic and clinical), present and publish the outcome at various scientific conferences and journals, both national and international level.

Skills:

The candidate should be able to

1. Take history, conduct clinical examination including all diagnostic procedures to arrive at diagnosis at the individual level and conduct survey of the community at state and national level of all conditions related to oral health to arrive at community diagnosis.
2. Plan and perform all necessary treatment, prevention and promotion of Oral Health at the individual and community level.
3. Plan appropriate Community Oral Health Program, conduct the program and evaluate, at the community level.
4. Ability to make use of knowledge of epidemiology to identify causes and plan appropriate preventive and control measures.
5. Develop appropriate person power at various levels and their effective utilization.
6. Conduct survey and use appropriate methods to impart Oral Health Education.
7. Develop ways of helping the community towards easy payment plan, and followed by evaluation for their oral health care needs.
8. Develop the planning, implementation, evaluation and administrative skills to carry out successful community Oral Health Programs.

Values:

1. Adopt ethical principles in all aspects of Community Oral Health Activities.
2. To apply ethical and moral standards while carrying out epidemiological researches.
3. Develop communication skills, in particular to explain the causes and prevention of oral diseases to the patient.
4. Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed and promote teamwork approach.
5. Respect patient's rights and privileges including patients right to information and right to seek a second opinion.

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COURSE CONTENTS:

A) Applied Basic Sciences:

Applied Anatomy and Histology:

a)Applied Anatomy in relation to:

- Development of face
- Bronchial arches
- Muscles of facial expression
- Muscles of mastication
- TMJ
- Salivary gland
- Tongue
- Hard and soft palate
- Infratemporal fossa
- Paranasal air sinuses
- Pharynx and larynx
- Cranial and spinal nerves- with emphasis on trigeminal, facial, glossopharyngeal and hypoglossal nerve
- Osteology of maxilla and mandible
- Blood supply, venous and lymphatic drainage of head and neck
- Lymph nodes of head and neck
- Structure and relations of alveolar process and edentulous mouth
- Genetics-fundamentals

b)Oral Histology:

- Development of dentition, Innervations of dentin and pulp
- Periodontium-development, histology, blood supply, nerve supply and lymphatic drainage
- Oral mucous membrane
- Pulp-periodontal complex

Applied Physiology and Biochemistry:

- Cell
- Mastication and deglutition
- Food and nutrition
- Metabolism of carbohydrates, proteins and fats
- Vitamins and minerals
- Saliva and Oral health
- Fluid and electrolyte balance
- Pain pathway and mechanism-types, properties
- Blood composition and functions, clotting mechanism and erythropoiesis, Blood groups and transfusions, Pulse and blood pressure,
- Dynamics of blood flow
- Cardiovascular homeostasis-heart sounds
- Respiratory system: Normal physiology and variations in health and diseases, Asphyxia and artificial respiration
- Endocrinology: thyroid, parathyroid, adrenals, pituitary, sex hormones and pregnancy, Endocrine regulation of blood sugar.

Applied Pathology:

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- Pathogenic mechanism of molecular level
- Cellular changes following injury
- Inflammation and chemical mediators
- Oedema, thrombosis and embolism
- Hemorrhage and shock
- Neoplasia and metastasis
- Blood disorders
- Histopathology and pathogenesis of dental caries, periodontal disease, oral mucosal lesions, and malignancies
- HIV
- Propagation of dental infection

Microbiology:

- Microbial flora of oral cavity
- Bacteriology of dental caries and periodontal disease
- Methods of sterilization
- Infection control in dental office / camps
- Virology of HIV, herpes, hepatitis
- Parasitology
- Basic immunology – basic concepts of immune system in human body
  - Cellular and humoral immunity
  - Antigen and antibody system
  - Hypersensitivity
  - Autoimmune diseases

Oral Pathology:

- Detailed description of diseases affecting the oral mucosa, teeth, supporting tissues and jaws.

Physical and Social Anthropology:

Anthropology is a part of Social Sciences, which also constitutes behavioral sciences i.e., Psychology and Sociology. Behavioral Sciences has been mentioned in Public Health.

- Introduction and definition
- Appreciation of the biological basis of health and disease
- Evolution of human race, various studies of different races by anthropological methods

Applied Pharmacology:

- Definition, scope and relations to other branches of medicine, mode of action, bioassay, standardization, pharmacodyanamics, pharmcokinetics.
- Chemotherapy of bacterial infections and viral infections – sulphonamides and antibiotics.
- Local anesthesia
- Analgesics and anti-inflammatory drugs
- Hypnotics, tranquilizers and antipyretics
- Important hormones-ACTH, cortisone, insulin and oral antidiabetics.
- Drug addiction and tolerance
- Important pharmacological agents in connection with autonomic nervous system- adrenaline, noradrenaline, atropine
- Brief mention of antihypertensive drugs
- Emergency drugs in dental practice
- Vitamins and haemopoietic drugs

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- Effect of drugs on oral health

Research Methodology and Biostatistics:

Health Informatics– basic understanding of computers and its components, operating software (Windows), Microsoft office, preparation of teaching materials like slides, project, multimedia knowledge. Operative skills in analyzing the data.

Research Methodology – definitions, types of research, designing written protocol for research, objectivity in methodology, quantification, records and analysis.

Biostatistics – introduction, applications, uses and limitations of bio – statistics in Public Health dentistry, collection of data, presentation of data, measures of central tendency, measures of dispersion, methods of summarizing, parametric and non parametric tests of significance, correlation and regression, multivariate analysis, sampling and sampling techniques – types, errors, bias, trial and calibration

B) Public Health

Public Health:

- Definition, concepts and philosophy of dental health
- History of public health in India and at international level
- Terminologies used in public health

Health:

- Definition, concepts and philosophy of health
- Health indicators
- Health determinants
- Community and its characteristics and relation to health

Disease:

- Definition, concepts
- Multifactorial causation, natural history, risk factors
- Disease control and eradication, evaluation and causation, infection of specific diseases
- Vaccines and immunization

General Epidemiology:

- Definition and aims, general principles
- Multifactorial causation, natural history, risk factors
- Methods in epidemiology, descriptive, analytical, experimental and classic epidemiology of specific diseases, uses of epidemiology
- Duties of epidemiologist
- General idea of method of investigating chronic diseases, mostly non-infectious nature, epidemic, endemic, and pandemic.
- Ethical conversation in any study requirement
- New knowledge regarding ethical subjects
- Screening of diseases and standard procedures used

Environmental Health:

- Impact of important components of the environment of health
- Principles and methods of identification, evaluation and control of such health hazards
- Pollution of air, water, soil, noise, food
- Water purification, international standards of water
- Domestic and industrial toxins, ionizing radiation

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- Occupational hazards
- Waster disposal- various methods and sanitation

Public Health Education:
- Definition, aims, principles of health education
- Health education, methods, models, contents, planning health education programs

Public Health Practice and Administration System in India.

Ethics and Jurisprudence:
- Basic principles of law
- Contract laws- dentist – patient relationships & Legal forms of practice
- Dental malpractice
- Person identification through dentistry
- Legal protection for practicing dentist
- Consumer protection act

Nutrition in Public Health:
- Study of science of nutrition and its application to human problem
- Nutritional surveys and their evaluations
- Influence of nutrition and diet on general health and oral health, dental caries, periodontal disease and oral cancers
- Dietary constituents and cariogenecity
- Guidelines for nutrition

Behavioral Sciences:
- Definition and introduction
- Sociology: social class, social group, family types, communities and social relationships, culture, its effect on oral health.
- Psychology: definition, development of child psychology, anxiety, fear and phobia, intelligence, learning, motivation, personalities, fear, dentist-patient relationship, modeling and experience

Hospital Administration:
- Departmental maintenance, organizational structures
- Types of practices
- Biomedical waste management

Health Care Delivery System:
- International oral health care delivery systems – Review
- Central and state system in general and oral health care delivery system if any
- National and health policy
- National health programmes
- Health Planning and Evaluation
- Primary health care – concepts, oral health in PHC and its implications
- National and international health organizations
- Dentists Act 1928, Dental council of India, Ethics, Indian Dental Association
- Role of W.H.O. and Voluntary organizations in Health Care for the Community

Oral Biology and Genetics:
- A detailed study of cell structure
- Introduction to Genetics, Gene structure, DNA, RNA
- Genetic counseling, gene typing
- Genetic approaches in the study of oral disorders

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- Genetic Engineering - Answer to current health problems

Demography & Family Planning:
Demographic trends, family planning methods, milestones in population control in India.

Health Economics:
Health benefit analysis and Cost effective analysis

C) Dental Public Health:

Dental Public Health:
- History
- Definition and concepts of dental public health
- Differences between clinical and community dentistry
- Critical review of current practice
- Dental problems of specific population groups such as chronically ill, handicapped and institutionalized group

Epidemiology of Oral Diseases and Conditions:
- Dental caries, gingival, periodontal disease malocclusion, dental Fluorosis, oral cancer, TMJ disorders and other oral health related problems.

Oral Survey Procedures:
- Planning
- Implementation
- WHO basic oral health methods 1997
- Indices for dental diseases and conditions
- Evaluation

Delivery of Dental Care:
- Dental person power – dental auxiliaries
- Dentist – population ratios,
- Public dental care programs
- School dental health programs- Incremental and comprehensive care
- Private practice and group practice
- Oral health policy – National and international policy

Payment for Dental Care:
- Prepayment
- Post-payment
- Reimbursement plans
- Voluntary agencies
- Health insurance

Evaluation of Quality of Dental Care:
- Problems in public and private oral health care system program
- Evaluation of quality of services, governmental control

Preventive Dentistry:
- Levels of prevention
- Preventive oral health programs screening, health education and motivation
- Prevention of all dental diseases-dental caries, periodontal diseases, oral cancer, malocclusion and Dentofacial anomalies
- Role of dentist in prevention of oral diseases at individual and community level.
- Fluoride

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  - History
  - Mechanism of action
  - Metabolism
  - Fluoride toxicity
  - Fluorosis
  - Systemic and topical preparations
  - Advantages and disadvantages of each
  - Update regarding Fluorosis
  - Epidemiological studies
  - Methods of fluoride supplements
  - Defluoridation techniques
  - Antifluoridation lobby
- Plaque control measures-
  - Health Education
  - Personal oral hygiene
  - Tooth brushing technique
  - Dentifrices, mouth rinses
- Pit and fissure sealant, ART, Preventive resin restoration
- Preventive oral health care for medically compromised individual
- Update on recent preventive modalities
- Caries vaccines
- Dietary counseling

Practice Management:
- Definition
- Principles of management of dental practice and types
- Organization and administration of dental practice
- Ethical and legal issues in dental practice
- Current trends
- Infection control in dental practice

Tobacco Counseling:
- Health Consequences
- Tobacco dependence
- Benefits of intervention
- Tobacco cessation
- Role of dentist

Health Man Power Planning:

Structured Training Schedule:

FIRST YEAR

Seminars:
- 5 seminars in basic sciences subject,
- To conduct 10 journal clubs
- Library assignment on assigned topics – 2
- Submission of synopsis for dissertation-within 6 months
- Periodic review of dissertation at two monthly intervals

Clinical Training:
1. Clinical assessment of patient

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2. Learning different criteria and instruments used in various oral indices assessing oral hygiene, periodontal disease, wasting disease, flourosis and malocclusion – 5 cases each
   - Oral Hygiene Index – Greene and Vermillion
   - Oral Hygiene Index – Simplified
   - DMF – DMF (T), DMF (S)
   - def t/s
   - Fluorosis Indices – Dean's Fluorosis Index, Tooth Surface Index for Fluorosis, Thylstrup and Fejerskov Index
   - Community Periodontal Index (CPI)
   - Plaque Index-Silness and Loe, gingival index – Loe and Silness
   - Russels periodontal disease index
   - WHO Oral Health Assessment Form – 1997
   - Carrying out treatment (under comprehensive oral health care) of 10 patients
   - maintaining complete records.

Field Programme:

- Carrying out preventive programs and health education for school children of the adopted school.
- School based preventive programs-
- Topical Fluoride application-Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations and Fluoride varnishes, Fluoride mouth rinses
- Pit and Fissure Sealant – chemically cured (GIC), light cured
- Minimal Invasive Treatment-Preventive Resin Restorations (PRR), Atraumatic Restorative Treatment (ART)
- Organizing and carrying out dental camps in both urban and rural areas.

3. Visit to slum, water treatment plant, sewage treatment plant, and Milk dairy, Public Health Institute, Anti-Tobacco Cell, Primary Health Center and submitting reports.
4. In additions the postgraduate shall assist and guide the under graduate students in their clinical and field programs.

SECOND YEAR

Seminars:

- Seminars in Public Health and Dental Public Health topics
- Conducting journal clubs
- Short term research project on assigned topics – 2
- Periodic review of dissertation at monthly reviews

Clinical Training-Continuation of the Clinical Training:

1. Clinical assessment of patient
2. Learning different criteria and instruments used in various oral indices assessing oral hygiene, periodontal disease, wasting disease, flourosis and malocclusion – 5 each
   - Oral Hygiene Index – Greene and Vermillion
   - Oral Hygiene Index – Simplified
   - DMF – DMF (T), DMF (S)
   - def t/s
   - Fluorosis Indices – Dean's Fluorosis Index, Tooth Surface Index for Fluorosis, Thylstrup and Fejerskov Index
   - Community Periodontal Index (CPI)
   - Plaque Index-Silness and Loe, gingival index – Loe and Silness
   - Russels periodontal disease index

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- WHO Oral Health Assessment Form – 1987
- Carrying out treatment (under comprehensive oral health care) of 10 patients – maintaining complete records

Field Program – Continuation of Field Program:

- Carrying out school dental health education
- School based preventive programs-
  - Topical Fluoride application-Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations and Fluoride varnishes, Fluoride mouth rinses
  - Pit and Fissure Sealant – chemically cured (GIC), light cured
  - Minimal Invasive Treatment-Preventive Resin Restorations (PRR), Atraumatic Restorative Treatment (ART)
  - Organizing and carrying out dental camps in both urban and rural areas.
- Assessing oral health status of various target groups like School children, Expectant mothers Handicapped, Underprivileged, and geriatric populations. Planning dental manpower and financing dental health care for the above group.
- Application of the following preventive measures in clinic-10 Cases each.
  - Topical Fluoride application – Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations and Fluoride varnishes.
  - Pit and Fissure Sealant
- Planning total health care for school children in an adopted school:
  - Periodic surveying of school children
  - Incremental dental care
  - Comprehensive dental care
- Organizing and conducting community oral health surveys for all oral conditions-3 surveys
- In addition the post graduate shall assist and guide the under graduate students in their clinical and field programs
- To take lecture classes (2) for Undergraduate students in order to learn teaching methods (pedagogy) on assigned topic.

THIRD YEAR:

Seminars:

- Seminars on recent advances in Preventive Dentistry and Dental Public Health
- Critical evaluation of scientific articles – 10 articles
- Completion and submission of dissertation

Clinical Training:

- Clinical assessment of patient
- Learning different criteria and instruments used in various oral indices assessing oral hygiene, periodontal disease, wasting disease, flourosis and malocclusion – 5 each
  - Oral Hygiene Index – Greene and Vermillion
  - Oral Hygiene Index – Simplified
  - DMF – DMF (T), DMF (S)
  - def t/s
  - Fluorosis Indices – Dean's Fluorosis Index, Tooth Surface Index for Fluorosis, Thylstrup and Fejerskov Index
  - Community Periodontal Index (CPI)
  - Plaque Index-Silness and Loe, gingival index – Loe and Silness
  - Russels periodontal disease index

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  - WHO Oral Health Assessment Form – 1987
  - Carrying out treatment (under comprehensive oral health care) of 10 patients – maintaining complete records
- Carrying out school dental health education
- School based preventive programs-
  - Topical Fluoride application – Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations and Fluoride varnishes.
  - Pit and Fissure Sealant
  - Minimal Invasive Techniques – Preventive Resin Restorations (PRR), Atraumatic Restorative Treatment (ART)
- To take lecture classes (2) for Undergraduate students in order to learn teaching methods (pedagogy) on assigned topic
- Exercise on solving community health problems – 10 problems
- Application of the following preventive measures in clinic – 10 cases each.
  - Topical Fluoride application – Sodium Fluoride, Stannous Fluoride, Acidulated Phosphate Fluoride preparations
  - Pit and Fissure sealants
- Dental – health education training of school teachers, social workers, health workers,
- Posting at dental satellite centers/ nodal centers
- In addition the post graduate shall assist and guide the under graduate students in their clinical and field programs.

Monitoring Learning Process:

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 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:	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 Anatomy and Histology, Applied Physiology and Biochemistry, Applied Pathology, Microbiology, Oral Pathology, Physical and Social Anthropology, Applied Pharmacology and Research Methodology and Biostatistics.

PART-II :

Paper-I : Public Health
Paper-II : Dental Public Health

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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

1. Clinical examination of at least 2 patients representing the community – includes history, main complaints, examination and recording of the findings, using indices for the assessment of oral health and presentation of the observation including diagnosis, comprehensive treatment planning. (50 Marks – 1 ½ Hrs)

2. Performing (50 Marks– 1 ½ Hrs)
   a. One of the treatment procedures as per treatment plan. (Restorative, surgical, rehabilitation)
   b. Preventive oral health care procedure.
   c. One of the procedures specified in the curriculum

3. Critical evaluation of a given research article published in an international journal
   ▪ Marks – 1 Hour)

4. Problem solving – a hypothetical oral health situation existing in a community is given with sufficient data. The student as a specialist in community dentistry is expected to suggest practical solutions to the existing oral health situation of the given community. (50 Marks – 1 ½ Hours)

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.

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8. PEDIATRIC AND PREVENTIVE DENTISTRY

OBJECTIVES:

At the end of 3 years of training the candidate should be able to

1. Create not only a good oral health in the child but also a good citizen tomorrow.
2. Instill a positive attitude and behavior in children
3. Understand the principles of prevention and preventive dentistry right from birth to adolescence
4. Guide and counsel the parents in regards to various treatment modalities including different facets of preventive dentistry
5. Prevent and intercept developing malocclusion

Skills:

1. Obtain proper clinical history, methodological examination of the child patient, perform essential diagnostic procedures and interpret them. and arrive at a reasonable diagnosis and treat appropriately
2. Be competent to treat dental diseases which are occurring in child patient.
3. Manage to repair and restore the lost / tooth structure to maintain harmony between both hard and soft tissues of the oral cavity.
4. Manage the disabled children effectively and efficiently, tailored to the needs of individual requirement and conditions.
5. To acquire skills in managing efficiently life threatening conditions with emphasis on basic life support measures.

Attitudes:

1. Develop an attitude to adopt ethical principles in all aspects of Pedodontic practice.
2. Professional honesty and integrity are to be fostered
3. Treatment care is to be delivered irrespective of the social status, cast, creed, and religion of the patients.
4. Willingness to share the knowledge and clinical experience with professional colleagues.
5. Willingness to adopt, after a critical assessment, new methods and techniques of Pedodontic management developed from time to time, based on scientific research, which are in the best interest of the child patient.
6. Respect child patient's rights and privileges, including child patients right to information and right to seek a second opinion.
7. Develop an attitude to seek opinion from allied medical and dental specialities, as and when required

COURSE CONTENTS:

A) Applied Basic Sciences:

Applied Anatomy of Head and Neck:

- Anatomy of the scalp, temple and face
- Anatomy of the triangles of neck and deep structures of the neck
- Cranial and facial bones and its surrounding soft tissues with its applied aspects
- Muscles of head and neck
- Arterial supply, venous drainage and lymphatics of head and neck
- Congenital abnormalities of the head and neck
- Anatomy of the cranial nerves

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- Anatomy of the tongue and its applied aspects
- Anatomy and its applied aspects of salivary glands, pharynx, thyroid and parathyroid gland, larynx, trachea, esophagus
- Autonomous nervous system of head and neck
- Functional anatomy of mastication, deglutition, speech, respiration and circulation
- TMJ: anatomy and function

Applied Physiology:

Introduction, Mastication, deglutition, digestion and assimilation, Homeostasis, fluid and electrolyte balance. Blood composition, volume, function, blood groups and hemorrhage, Blood transfusion, circulation, Heart, Pulse, Blood pressure, Normal ECG,capillary and lymphatic circulation, shock, respiration, control, anoxia, hypoxia, asphyxia, artificial respiration. Endocrine glands in particular reference to pituitary, parathyroid and thyroid glands and sex hormones. Role of calcium and Vit D in growth and development of teeth, bone and jaws.Role of Vit.A, C and B complex in oral mucosal and periodontal health.Physiology and function of the masticatory system. Speech mechanism, swallowing and deglutition mechanism, salivary glands and Saliva

Applied Pathology:

Inflammation and chemical mediators, Thrombosis, Embolism, Necrosis, Repair, Degeneration , Shock, Hemorrhage , Blood dyscrasias, Pathogenesis of Dental Caries, Periodontal diseases, tumors, oral mucosal lesions etc. in children

Applied Microbiology:

Microbiology & Immunology as related to Oral Diseases in Children: Basic concepts, immune system in human body, Auto Immune diseases and Immunology of Dental caries.

Applied Nutrition & Dietics:

- General principles, balanced diet, effect of dietary deficiencies and starvation, protein energy, malnutrition, Kwashiorkor, Marasmus.
- Fluid and Electrolytic balance in maintaining haemostasis
- Diet, digestion, absorption, transportation and utilization

Genetics:

- Introduction to genetics
- Cell structure, DNA, RNA, protein synthesis, cell division
- Modes of inheritance
- Chromosomal anomalies of oral tissues & single gene disorders

Growth & Development:

Prenatal and Postnatal development of cranium, face, jaws, teeth and supporting structures.Chronology of dental development and development of occlusion. Dimensional changes in dental arches. Cephalometric evaluation of growth.

B) Pediatric Dentistry:

- Child Psychology:

  Development & Classification of behavior, personality, intelligence in children, theories of child psychology, stages of psychological child development, fear, anxiety, apprehension & its management.

- Behavior Management: Non- pharmacological & Pharmacological methods.

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- Child Abuse & Dental Neglect:
- Conscious Sedation:
- Deep Sedation & General Anesthesia in Pediatric Dentistry: (Including Other Drugs, Synergic & Antagonistic Actions of Various Drugs Used in Children

Preventive Pedodontics:

Concepts, chair side preventive measures for dental diseases, high-risk caries including rampant & extensive caries – Recognition, Features & Preventive Management, Pit and Fissures Sealants, Oral Hygiene measures, Correlation of brushing with dental caries and periodontal diseases. Diet & Nutrition as related to dental caries. Diet Counseling

Dental Plaque:

Definition, Initiation, Pathogenesis, Biochemistry, and Morphology & Metabolism.

Gingival & Periodontal diseases in Children:

- Normal Gingiva & Periodontium in children.
- Gingival & Periodontal diseases – Etiology, Pathogenesis, Prevention & Management

Pediatric Operative Dentistry:

- Principle of Operative Dentistry along with modifications of materials/past, current & latest including tooth colored materials.
- Modifications required for cavity preparation in primary and young permanent teeth.
- Various Isolation Techniques
- Restorations of decayed primary, young permanent and permanent teeth in children using various restorative material like Glass Ionomer, Composites, Silver, Amalgam & latest material (gallium)
- Stainless steel, Polycarbonate & Resin Crowns / Veneers & fibre post systems.

Pediatric Endodontics:

- Primary Dentition: - Diagnosis of pulpal diseases and their management – Pulp capping, Pulpotomy, Pulpectomy (Materials & Methods), Controversies & recent concepts.
- Young permanent teeth and permanent teeth, Pulp capping, Pulpotomy, Apexogenesis, Apexification, Concepts, Techniques and Materials used for different procedures.
- Recent advances in Pediatric diagnosis and Endodontics.
  Prosthetic consideration in Pediatric Dentistry.

Traumatic Injuries in Children:

- Classifications & Importance.
- Sequelae & reaction of teeth to trauma.
- Management of Traumatized teeth with latest concepts.
- Management of jaw fractures in children.

Interceptive Orthodontics:

- Concepts of occlusion and esthetics: Structure and function of all anatomic components of occlusion, mechanics of articulations, recording of masticatory function, diagnosis of Occlusal dysfunction, relationship of TMJ anatomy and pathology and related neuromuscular physiology.

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- A comprehensive review of the local and systemic factors in the causation of malocclusion.
- Recognition and management of normal and abnormal developmental occlusions in primary, mixed and permanent dentitions in children (Occlusal Guidance).
- Biology of tooth movement: A comprehensive review of the principles of teeth movement. Review of contemporary literature. Histopathology of bone and Periodontal ligament, Molecular and ultra cellular consideration in tooth movement.
- Myofunctional appliances: Basic principles, contemporary appliances: Design & Fabrication
- Removable appliances: Basic principles, contemporary appliances: Design & Fabrication
- Case selection & diagnosis in interceptive Orthodontics (Cephalometrics, Image processing, Tracing, Radiation hygiene, Video imaging & advance Cephalometric techniques).
- Space Management: Etiology, Diagnosis of space problems, analysis, Biomechanics, Planned extraction in interceptive orthodontics.

Oral Habits in Children:

- Definition, Etiology & Classification
- Clinical features of digit sucking, tongue thrusting, mouth breathing & various other secondary habits.
- Management of oral habits in children

Dental care of Children with special needs:

Definition, Etiology, Classification, Behavioral, Clinical features & Management of children with:

- Physically handicapped conditions
- Mentally compromising conditions
- Medically compromising conditions
- Genetic disorders

Oral manifestations of Systemic Conditions in Children & their Management
Management of Minor Oral Surgical Procedures in Children
Dental Radiology as related to Pediatric Dentistry

Cariology:

- Historical background
- Definition, Aeitology & Pathogenesis
- Caries pattern in primary, young permanent and permanent teeth in children.
- Rampant caries, early childhood caries and extensive caries. Definition, aeitology, Pathogenesis, Clinical features, Complications & Management.
- Role of diet and nutrition in Dental Caries
- Dietary modifications & Diet counseling.
- Subjective & objective methods of Caries detection with emphasis on Caries Activity tests, Caries prediction, Caries susceptibility & their clinical Applications

Pediatric Oral Medicine & Clinical Pathology: Recognition & Management of developmental dental anomalies, teething disorders, stomatological conditions, mucosal lesions, viral infections etc.

Congenital Abnormalities in Children: Definition, Classification, Clinical features & Management.

Dental Emergencies in Children and their Management.

Dental Materials used in Pediatric Dentistry.

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C) Preventive Dentistry:

- Definition
- Principles & Scope
- Types of prevention
- Different preventive measures used in Pediatric Dentistry including fissure sealants and caries vaccine.

Dental Health Education & School Dental Health Programmes:

Dental health concepts, Effects of civilization and environment, Dental Health delivery system, Public Health measures related to children along with principles of Pediatric Preventive Dentistry

Fluorides:

- Historical background
- Systemic & Topical fluorides
- Mechanism of action
- Toxicity & Management.
- Defluoridation techniques.

Medico legal aspects in Pediatric Dentistry with emphasis on informed concert.

Counseling in Pediatric Dentistry

Case History Recording: Outline of principles of examination, diagnosis & treatment planning.

Epidemiology: Concepts, Methods of recording & evaluation of various oral diseases. Various national & global trends of epidemiology of oral diseases.

Comprehensive Infant Oral Health Care.

Principles of Bio-Statistics& Research Methodology & Understanding of Computers and Photography

Comprehensive cleft care management with emphasis on counseling, feeding, nasoalveolar bone remodeling, speech rehabilitation.

Setting up of Pediatric Dentistry Clinic.

Emerging concepts in Pediatric Dentistry of scope of lasers / minimum invasive procedures in Pediatric Dentistry.

Preclinical Work

(Duration – first 6 Months of First Year MDS)

(One on Each Exercise)

1. Carving of all deciduous teeth
2. Basic wire bending exercises(Clasps, Bows, Retractors and Springs, etc., on patient models)
3. Basics for Spot welding exercises
4. Fabrication of
   a. Maxillary bite plate / Hawley's'
   b. Maxillary expansion screw appliance
   c. Canine retractor appliance

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d. All habit breaking appliances
   - Removable type
   - Fixed type
   - Partially fixed and removable

e. Myofunctional appliances – Twin block, Activator, Lip bumper, Oral Screen
f. Making of inclined plane appliance
g. Feeding appliances

5. Basic soldering exercises – making of a lamppost of stainless steel wire pieces of different gauges soldered on either side of heavy gauge main post.
6. Fabrication of space maintainers
   a. Removable type-
      - Unilateral Non – Functional space maintainer
      - Bilateral Non-Functional space maintainer
   b. Space Regainers –
      - Gerber or Opencoil space regainer
   c. Fixed Space maintainers
      - Band & loop space maintainer
      - Transpalatal arch space maintainer
      - Nance Palatal holding arch
      - Distal shoe appliance
7. Basics for spot welding exercise
8. Collection of extracted deciduous and permanent teeth
   a. Sectioning of the teeth at various levels and planes
   b. Drawing of section and shapes of pulp
   c. Phantom Head Exercises : Performing ideal cavity preparation for various restorative materials for both Deciduous and permanent teeth
   d. Performing pulpotomy, root canal treatment and Apexification procedure
      i) Tooth preparation and fabrication of various temporary and permanent restorations on fractured anterior teeth.
      ii) Preparation of teeth for various types of crowns
      iii) Laminates/veneers
      iv) Bonding & banding exercise
9. Performing of behavioral rating and IQ tests for children.
10. Computation of: -
    a. Caries index and performing various caries activity tests.
    b. Oral Hygiene Index
    c. c. Fluorosis Index
11. Surgical Exercises :
    a. Fabrication of splints
    b. Type of Wiring
    c. Suturing
12. a. Taking of periapical, occlusal, bitewing radiographs of children
    b. Developing and processing of films, thus obtained
    c. Tracing of soft tissue dental and skeletal landmarks as observed on Cephalometric radiographs and drawing of various planes and angles, further interpretation of Cephalometric radiographs.
    d. Mixed dentition cast analysis
13. Library assignment
14. Synopsis

Clinical work Requirements from 7 to 36 months

The following is the minimum requirement to be completed before the candidate can be considered eligible to appear in the final M.D.S Examinations:

S.	Clinical Work	Total	7 To 12	13 To 24	25 To 36

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			Months	Months	Months
1.	Behavior Management of different age groups children with complete records.	17	2	10	5
2.	Detailed Case evaluation with complete records, treatment planning and presentation of cases with chair side and discussion	17	2	10	5
3.	Step-by-step chair side preventive dentistry scheduled for high risk children with gingival and periodontal diseases &Dental Caries	11	1	5	5
4.	Practical application of Preventive dentistry concepts in a class of 35-50 children& Dental Health Education & Motivation.	7	1	4	2
5.	Pediatric Operative Dentistry with application of recent concepts. (a). Management of Dental Caries				
	(I) Class I	50	30	10	10
	(II) Class II	100	40	50	10
	(III) Other Restorations	100	20	50	30
	(b). Management of traumatized anterior teeth	15	04	06	05
	(c) Aesthetic Restorations	25	05	10	10
	(d). Pediatric Endodontic Procedures Deciduous teeth Pulpotomy / Pulpectomy Permanent Molars Permanent Incisor Apexification & Apexogenesis	 150 20 15 20	 30 3 2 02	 50 7 3 08	 70 10 10 10
6.	Stainless Steel Crowns	50	10	20	20
7.	Other Crowns	05	01	02	02
8.	Fixed : Space Maintainers Habit breaking appliances	30	08	12	10
9.	Removable : Space Maintainers Habit breaking appliances	20	05	07	08
10.	Functional Appliances	05	01	02	02
11.	Preventive measures like fluoride applications & Pit & Fissure Sealants applications with complete follow-up and diet counseling	20	08	08	04
12.	Special Assignments (i) School Dental Health Programmes	03	01	01	01
	(ii) Camps etc.,	02	01	01	-
13	Library usage				
14	Laboratory usage				
15	Continuing Dental Health Programmes				

(The figures given against Sl. No. 4 to 12 are the minimum number of recommended procedures to be performed)

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

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structured and assessment be done using checklists that assess various aspects. Checklists are given in Section IV

Scheme 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 Growth & Development and Dental plaque, Genetics.

Part-II:

Paper-I :**Clinical Paedodontics**

1. Conscious sedation, Deep Sedation & General Anesthesia in Pediatric Dentistry
2. Gingival & Periodontal Diseases in Children
3. Pediatric Operative Dentistry
4. Pediatric Endodontics
5. Traumatic Injuries in Children
6. Interceptive Orthodontics
7. Oral Habits in children
8. Dental Care of Children with special needs
9. Oral Manifestations of Systemic Conditions in Children & their Management
10. Management of Minor Oral Surgical Procedures in Children
11. Dental Radiology as Related to Pediatric Dentistry
12. Pediatric Oral Medicine & Clinical Pathology
13. Congenital Abnormalities in Children
14. Dental Emergencies in Children & Their Management
15. Dental Materials Used in Pediatric Dentistry
16. Case History Recording
17. Setting up of Pedodontic & Preventive Dentistry Clinic

Paper-II: Preventive and Community Dentistry as applied to Pediatric Dentistry

1. Child Psychology
2. Behavior Management
3. Child Abuse & Dental Neglect
4. Preventive Pedodontics
5. Cariology
6. Preventive Dentistry
7. Dental Health Education & School Dental Health Programmes:
8. Fluorides
9. Epidemiology
10. Comprehensive Infant Oral Health Care/Comprehensive cleft care
11. Principles of Bio-Statistics & Research Methodology & Understanding of Computers and Photography

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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**

The Clinical / Practical and Viva-Voce Examinations are conducted for a minimum of two days.

First Day:

1. **Case Discussion, Pulp Therapy i.e. Pulpectomy on a Primary Molar.**

Case Discussion	:	20 marks
Rubber Dam application	:	10 marks
Working length X-ray	:	20 marks
Obturation	:	20 marks
Total		70 marks

2. **Case Discussion, Crown preparation on a Primary Molar for Stainless steel crown and cementation of the same.**

Case discussion	:	10 marks
Crown Preparation	:	20 marks
Crown selection and Cementation	:	20 marks
Total		50 marks

3. **Case Discussion, band adaptation for fixed type of space maintainer and impression making.**

Case discussion	:	20 marks
Band adaptation	:	20 marks
Impression	:	20 marks
Total		60 marks

Second Day:

1. **Evaluation of Fixed Space Maintainer and Cementation** : 20 marks

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.

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9. 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

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- 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

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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
e. 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

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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

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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

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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 Patient	- Case history recordings	–	100
	- FNAC	–	50
	- Biopsy	–	50
	- Observe, Assist, & Perform under supervision		
2. Intra – oral radiographs:			
	- Perform and interpretation	–	500
3. Full mouth intra oral radiograph tracings		–	3
4. Age estimation using radiographs		–	10

2nd Year:

1. Dental treatment to medically compromised patients		–	2
- Observe, assist, and perform under supervision			
2. Extra oral radiographs, digital radiography		–	20
- Observe, assist and perform under supervision, Interpretation			
3. Extra Oral radiographs tracings		–	3
4. CBCT Interpretations	–	5	

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
- OPG		–	50
- Periapical view		–	100
- Bitewing view		–	50
- Occlusal view		–	50
- Extra – oral radiographs of different views		–	**25**
- CBCT Interpretations	–	10	
- Treatment of mucosal lesions with LASER	–	3	

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

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)

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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
	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.

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Mechanic)															
Dent. Hygst.											5				5
Radiographer											3				3
Photographer										1					1
Artist										1					1
Programmer												1			1
Data Entry Operators												2			2
Physical Director														1	1
Engineer								1							1
Electricians								4							4
Plumber								2							2
Carpenter								1							1
Mason								1							1
A.C. Tech.								1							1
Helpers Electrical								3							3
Sweepers & Scavangers							2	4			5		6		17
Attenders	3	1	1		1	2	2	3			5	1	6		25
Security Personal									6						6
Dept. Secretaries											8				8
Driver									5						5
Nurses											9				9
Lab. Technicians													5		5

Note:
The above staff pattern indicates minimum requirements for the stipulated admissions. However, the actual staff requirements may marginally vary depending upon the patients' flow, work culture and design of the building.

SYLLABUS OF STUDY

1. HUMAN ANATOMY, EMBRYOLOGY, HISTOLOGY & MEDICAL GENETICS

A) GOAL

The students should gain the knowledge and insight into, the functional anatomy of the normal human head and neck, functional histology and an appreciation of the genetic basis of inheritance and disease, and the embryological development of clinically important structures. So that relevant anatomical & scientific foundations are laid down for the clinical years of the BDS course.

B) OBJECTIVES :

a) KNOWLEDGE & UNDERSTANDING:

At the end of the 1st year BDS course in Anatomical Sciences the undergraduate student is Expected to:

1. Know the normal disposition of the structures in the body while clinically examining a patient and while conducting clinical procedures.
2. Know the anatomical basis of disease and injury.
3. Know the microscopic structure of the various tissues, a pre-requisite for understanding of the disease processes.
4. Know the nervous system to locate the site of lesions according to the sensory and or motor deficits encountered.
5. Have an idea about the basis of abnormal development, critical stages of development, effects of teratogens, genetic mutations and environmental hazards.
6. Know the sectional anatomy of head neck and brain to read the features in radiographs and pictures taken by modern imaging techniques.
7. Know the anatomy of cardio-pulmonary resuscitation.

b) SKILLS

1. To locate various structures of the body and to mark the topography of the living anatomy.
2. To identify various tissues under microscope.
3. To identify the features in radiographs and modern imaging techniques.
4. To detect various congenital abnormalities.

C) INTEGRATION

By emphasising on the relevant information and avoiding unwanted details, the anatomy taught integrally with other basic sciences & clinical subjects not only keeps the curiosity alive in the learner but also lays down the scientific foundation for making a better doctor, a benefit to the society.

This insight is gained in a variety of ways:

1) Lectures & small group teaching
2) Demonstrations
3) Dissection of the human cadaver
4) Study of dissected specimens

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5) Osteology
6) Surface anatomy on living individual
7) Study of radiographs & other modern imaging techniques.
8) Study of Histology slides.
9) Study of embryology models
10) Audio-visual aids

Throughout the course, particular emphasis is placed on the functional correlation, clinical application & on integration with teaching in other bio dental disciplines.

D) AN OUTLINE OF THE COURSE CONTENT:

1. General anatomy: Introduction of anatomical terms and brief outline of various systems of the body.
2. Regional anatomy of head & neck with osteology of bones of head & neck, with emphasis on topics of dental importance.
3. General disposition of thoracic, abdominal & pelvic organs.
4. The regional anatomy of the sites of intramuscular & intra vascular injections, & lumbar puncture.
5. General embryology & systemic embryology with respect to development of head & neck.
6. Histology of basic tissues and of the organs of gastroinstenstinal, respiratory, Endocrine, excretory systems & gonads.
7. Medical genetics.

E) FURTHER DETAILS OF THE COURSE.

I. INTRODUCTION TO :

1. Anatomical terms.
2. Skin, superficial fascia & deep fascia
3. Cardiovascular system, portal system collateral circulation and arteries.
4. Lymphatic system, regional lymph nodes
5. Osteology - Including ossification & growth of bones
6. Myology – Including types of muscle tissue & innervation.
7. Syndesmology – Including classification of Joints.
8. Nervous system

II. HEAD & NECK:

01. Scalp, face & temple, lacrimal apparatus 02. Neck - Deep fascia of neck, posterior triangle, suboccipital triangle, anterior triangle, anterior median region of the neck, deep structures in the neck. 03.Cranial cavity - Meninges, parts of brain, ventricles of brain, dural venous sinuses, cranial nerves attached to the brain, pituitary gland. 04. Cranial nerves - III, IV, V, VI, VII, IX,XII in detail. 05. Orbital cavity – Muscles of the eye ball, supports of the eye ball, nerves and vessels in the orbit. 06. Parotid gland. 07. Temporo mandibular joint, muscles of mastication, infratemporal fossa, pterygo - palatine fossa. 08. Submandibular region 09. Walls of the nasal cavity, paranasal air sinuses 10. Palate 11. Oral cavity, Tongue 12. Pharynx (palatine tonsil and the auditory tube) Larynx. OSTEOLOGY – Foetal skull, adult skull, individual bones of the skull, hyoid bone and cervical vertebrae

III.THORAX : Demonstration on a dissected specimen of

1. Thoracic wall
2. Heart chambers
3. Coronary arteries
4. Pericardium
5. Lungs – surfaces ; pleural cavity
6. Diaphragm

IV. ABDOMEN : Demonstration on a dissected specimen of

1. Peritoneal cavity
2. Organs in the abdominal & pelvic cavity.

V. CLINICAL PROCEDURES :

a) Intramuscular injections: Demonstration on a dissected specimen and on a living person of the following sites of injection.
   1. Deltoid muscle and its relation to the axillary nerve and radial nerve.
   2. Gluteal region and the relation of the sciatic nerve.
   3. Vastus lateralis muscle.
b) Intravenous injections & venesection: Demonstration of veins in the dissected specimen and on a living person.

1. Median cubital vein 2. Cephalic vein 3. Basilic vein 4. Long saphenous vein

c) Arterial pulsations: Demonstration of arteries on a dissected specimen and feeling of pulsation of the following arteries on a living person.

1. Superficial temporal 2. Facial 3. Carotid 4. Axillary 5. Brachial 6. Radial 7. Ulnar 8. Femoral 9. Popliteal 10. Dorsalispedis

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d) Lumbar puncture: Demonstration on a dissected specimen of the spinal cord, cauda equina & epidural space and the inter vertebral space between L4 & L5 .

VI. EMBRYOLOGY :

Oogenesis, Spermatogenesis, Fertilisation, Placenta, Primitive streak, Neural crest, Bilaminar and trilaminar embryonic disc, Intra embryonic mesoderm - formation and fate, notochord formation & fate, Pharyngeal arches, pouches & clefts, Development of face, tongue, palate, thyroid gland, pituitary gland, salivary glands, and anomalies in their development, Tooth development in brief.

VII. HISTOLOGY :

The Cell :

Basic tissues - Epithelium, Connective tissue including cartilage and bone, Muscle Tissue, Nervous tissue : Peripheral nerve, optic nerve, sensory ganglion, motor ganglion, Skin

Classification of Glands

Salivary glands (serous, mucous and mixed gland), Blood vessels, Lymphoid tissue Tooth, lip, tongue, hard palate, oesphagus, stomach, ,duodenum ,ileum, colon, vermiform appendix Liver, Pancreas, Lung, Trachea ,Epiglottis, Thyroid gland , para thyroid gland , supra renal gland and pituitary gland, Kidney, Ureter, Urninary bladder, Ovary and testis.

VIII. MEDICAL GENETICS :

Mitosis, meiosis, Chromosomes, gene structure, Mendelism, modes of inheritance

RECOMMENDED BOOKS:

1. SNELL (Richard S.) Clinical Anatomy for Medical Students, Ed. 5, Llittle Brown & company, Boston.
2. RJ LAST'S Anatomy – McMinn, 9th edition.
3. ROMANES(G.J.) Cunningham Manual of Practical Anatomy : Head & Neck & Brain Ed.15.Vol.III, Oxford Medical publication.
4. WHEATER,BURKITT & DANIELS, Functional Histology, Ed. 2, Churchill Livingstone.
5. SADLER , LANGMAN'S, Medical Embryology, Ed. 6.
6. JAMES E ANDERSON, Grant's Atlas of Anatomy. Williams & Wilkins.
7. WILLIAMS, Gray's Anatomy, Ed.38. ,Churchill Livingstone.
8. EMERY,Medical Genetics.

2. HUMAN PHYSIOLOGY

A) GOAL

The broad goal of the teaching undergraduate students in Human Physiology aims at providing the student comprehensive knowledge of the normal functions of the organ systems of the body to facilitate an understanding of the physiological basis of health and disease.

OBJECTIVES

a) KNOWLEDGE

At the end of the course, the student will be able to:

1. Explain the normal functioning of all the organ systems and their interactions for well co-ordinated total body function.
2. Assess the relative contribution of each organ system towards the maintenance of the milieu interior.
3. List the physiological principles underlying the pathogenesis and treatment of disease.

b) SKILLS

At the end of the course, the student shall be able to :

1. Conduct experiments designed for the study of physiological phenomena.
2. Interprete experimental and investigative data
3. Distinguish between normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory.

c) INTEGRATION

At the end of the integrated teaching the student shall acquire an integrated knowledge of organ structure and function and its regulatory mechanisms.

B) COURSE CONTENTS THEORY

1. GENERAL PHYSIOLOGY
   1. Homeostasis: Basic concept, Feed back mechanisms
   2. Structure of cell membrane, transport across cell membrane
   3. Membrane potentials

2. BLOOD:

Composition & functions of blood.
Specific gravity, Packed cell volume, factors affecting & methods of determination.
Plasma proteins - Types, concentration, functions & variations.
Erythrocyte - Morphology, functions & variations. Erythropoiesis & factors affecting erythropoiesis.
ESR- Methods of estimation, factors affecting, variations & significance.
Haemoglobin - Normal concentration, method of determination & variation in concentration.
Blood Indices - MCV, MCH, MCHC - definition, normal values, variation.

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Anaemia - Definition, classification, life span of RBC's destruction of RBC's , formation & fate of bile pigments, Jaundice - types.
Leucocytes : Classification, number, percentage, distribution morphology, properties, functions & variation. Role of lymphocytes in immunity , leucopoiesis life span & fate of leucocytes.
Thromobocytes - Morphology, , number, variations, function & thrombopoiesis.
Haemostatsis - Role of vasoconstriction, platelet plug formation in haemostasis, coagulation factors, intrinsic & extrinsic pathways of coagulation, clot retraction.
Tests of haemostatic function, platelet count, clotting time, bleeding time, prothrombin time - normal values, method & variations. Anticoagulants - mechanism of action. Bleeding disorders.
Blood groups: ABO & Rh system, method of determination, importance,indications & dangers of blood transfusion, blood substitutes.
Blood volume: Normal values, variations.
Body fluids : distribution of total body water, intracellular & extracellular compartments, major anions & cations in intra and extra cellular fluid.
Tissue fluids & lymph : Formation of tissue fluid, composition, circulation & functions of lymph. Oedema - causes.
Functions of reticulo endotrelial system.

3. MUSCLE AND NERVE
Classification of nerves, structure of skeletal muscle - Molecular mechanism of muscle contraction, neuromuscular transmission. Properties of skeletal muscle. Structure and properties of cardiac muscle & smooth muscle.

4. DIGESTIVE SYSTEM :
Introduction to digestion : General structure of G.I. tract, Innervation.
Salivary glands: Structure of salivary glands, composition , regulation of secretion & functions of saliva.
Stomach: Composition and functions of gastric juice, mechanism and regulation of gastric secretion.
Exocrine Pancreas - Structure, composition of pancreatic juice, functions of each component, regulation of pancreatic secretion.
Liver : structure , composition of bile, functions of bile, regulation of secretion –
Gall bladder : structure, functions.
Small intestine - Composition, functions & regulation of secretion of intestinal juice.
Large intestine - Functions.
Motor functions of GIT: Mastication, deglutition, gastric filling & emptying, movements of small and large intestine, defecation.

5. EXCRETORY SYSTEM :
Structure & functions of kidney, functional unit of kidney & functions of different parts.
Juxta glomerular apparatus, renal blood flow.
Formation of Urine : Glomerular filteration rate - definition, determination , normal values, factors influencing G.F.R. Tubular reabsorption - Reabsorption of sodium, glucose, water & other substances.
Tubular secretion - secretion of urea, hydrogen and other substances.
Mechanism of concentration & dilution of urine.
Role of kidney in the regulation of pH of the blood.
Micturition : anatomy & innervation of Urinary bladder, mechanism of miturition & abonrmalities.

6. BODY TEMPERATURE & FUNCTIONS OF SKIN

7. ENDOCRINOLOGY
General endocrinology - Enumeration of endocrine glands & hormones - General functions of endocrine system, chemistry, mechanism of secretion, transport, metabolism, regulation of secretion of hormones.
Hormones of anterior pituitary & their actions, hypothamic regulation of anterior pituitary function.
Disorders of secretion of anterior pituitary hormones.
Posterior pituitary : Functions, regulation & disorders of secretion.
Thyroid: Histology, synthesis, secretion & transport of hormones, actions of hormones, regulation of secretion & disorders, Thyroid function tests.
Adrenal cortex & Medulla -synthesis, secretion, action, metabolism, regulation of secretion of hormones & disorders.
Other hormones - Angiotensin, A.N.F.

8. REPRODUCTION
Sex differentiation, Physiological anatomy of male and female sex organs,
Female reproductive system : Menstrual cycle, functions of ovary, actions of oestrogen & Progesterone, control of secretion of ovarian hormones, tests for ovulation, fertilisation, implantation, maternal changes during pregnancy, pregnancy tests & parturition.
Lactation, composition of milk, factors controlling lactation, milk ejection, reflex, Male reproductive system :spermatogenesis, semen and contraception.

9. CARDIO VASCULAR SYSTEM
Functional anatomy and innervation of heart Properties of cardiac muscle
Origin & propagation of cardiac impulse and heart block.
Electrocardiogram - Normal electrocardiogram. Two changes in ECG in myocardial infarction.

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Cardiac cycle - Phases, Pressure changes in atria, ventricles & aorta.
Volume changes in ventricles. Jugular venous pulse, arterial pulse.
Heart sounds: Mention of murmurs.
Heart rate: Normal value, variation & regulation.
Cardiac output: Definition, normal values, one method of determination, variation, factors affecting heart rate and stroke volume.
Arterial blood pressure: Definition, normal values & variations,determinants, regulation & measurement of blood pressure.
Coronary circulation.
Cardio vascular homeostasis - Exercise & posture.

10. RESPIRATORY SYSTEM
Physiology of Respiration : External & internal respiration.
Functional anatomy of respiratory passage & lungs.
Respiratory movements: Muscles of respiration, Mechanism of inflation & deflation of lungs.
Intra pleural & intra pulmonary pressures & their changes during the phases of respiration.
Mechanics of breathing - surfactant, compliance & work of breathing.
Spirometry: Lung volumes & capacities definition, normal values, significance, factors affecting vital capacity, variations in vital capacity, FEV & its variations.
Pulmonary ventilation - alveolar ventilation & dead space – ventilation.
Composition of inspired air, alveolar air and expired air.
Exchange of gases: Diffusing capacity, factors affecting it.
Transport of Oxygen & carbon dioxide in the blood.
Regulation of respiration – neural & chemical.
Hypoxia, cyanosis, dyspnoea, periodic breathing.
Artificial respiration, pulmonary function tests.

11. CENTRAL NERVOUS SYSTEM
1. Organisation of central nervous system
2. Neuronal organisation at spinal cord level
3. Synapse receptors, reflexes, sensations and tracts
4. Physiology of pain
5. Functions of cerebellum, thalamus, hypothalamus and cerebral cortex.
6. Formation and functions of CSF
7. Autonomic nervous system

12. SPECIAL SENSES
Fundamental knowledge of vision, hearing, taste and smell.

PRACTICALS
The following list of practical is minimum and essential. All the practical have been categorised as procedures and demonstrations. The procedures are to be performed by the students during practical classes to acquire skills. All the procedures are to be included in the University practical examination. Those categorised as demonstrations are to be shown to the students during practical classes. However these demonstrations would not be included in the University examinations but question based on this would be given in the form of charts, graphs and calculations for interpretation by the students.

PROCEDURES
1. Enumeration of Red Blood Cells
2. Enumeration of White Blood Cells
3. Differential leucocyte counts
4. Determination of Haemoglobin
5. Determination of blood group
6. Determination of bleeding time and clotting time
7. Examination of pulse
8. Recording of blood pressure.

DEMONSTRATION:
1. Determination of packed cell volume and erythrocyte sedimentation rate
2. Determination of specific gravity of blood
3. Determination of erythrocyte fragility
4. Determination of vital capacity and timed vital capacity
5. Skeletal muscle experiments.
   Study of laboratory appliances in experimental physiology. Frog's gastrocneminus sciatic preparation. Simple muscle curve, effects of two successive stimuli, effects of increasing strength of stimuli, effects of temperature, genesis of fatigue and tetanus. Effect of after load and free load on muscle contraction, calculation of work done.
6. Electrocardiography: Demonstration of recording of normal Electro cardiogram
7. Clinical examination of cardiovascular and respiratory system.

TEXT BOOKS:
Guyton; Text book of Physiology, 9th edition.

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Ganong; Review of Medical Physiology, 19th edition
Vander; Human physiology, 5th edition
Choudhari; Concise Medical Physiology, 2nd edition
Chaterjee; Human Physiology, 10th edition
A.K. Jain; Human Physiology for BDS students, 1st edition

BOOKS FOR REFERENCE:

i) Berne & Levey; Physiology, 2nd edition
ii) West-Best & Taylor's, Physiological basis of Medical Practise, 11th edition

EXPERIMENTAL PHYSIOLOGY:

i) Rannade; Practical Physiology, 4th edition
ii) Ghai; a text book of practical physiology
iii) Hutchison's; Clinical Methods, 20th edition

BIOCHEMISTRY

AIMS AND SCOPE OF THE COURSE IN BIOCHEMISTRY

The major aim is to provide a sound but crisp knowledge on the biochemical basis of the life processes relevant to the human system and to dental/medical practice. The contents should be organised to build on the already existing information available to the students in the pre-university stage and reorienting. A mere rehash should be avoided.

The chemistry portion should strive towards providing information on the functional groups, hydrophobic and hydrophilic moieties and weak valence forces that organise macromolecules. Details on structure need not be emphasised.

Discussion on metabolic processes should put emphasis on the overall change, interdependence and molecular turnover. While details of the steps may be given, the student should not be expected to memorise them. An introduction to biochemical genetics and molecular biology is a must but details should be avoided. The exposure to antivitamins, antimetabolites and enzyme inhibitors at this stage, will provide a basis for the future study of medical subjects. An overview of metabolic regulation is to be taught by covering hormonal action, second messengers and regulation of enzyme activities. Medical aspects of biochemistry should avoid describing innumerable functional tests, most of which are not in vogue. Cataloguing genetic disorders under each head of metabolism is unnecessary. A few examples which correlate genotype change to functional changes should be adequate.

At the end of the course the student would be able to acquire a useful core of information, which can be retained for a long time. Typical acid tests can be used to determine what is to be taught or what is to be learnt. A few examples are given below.

1. Need not know the structure of cholesterol. Should know why it cannot be carried free in plasma.
2. Mutarotation should not be taught. Student should know why amylase will not hydrolyse cellulose.
3. Need not know the details of alpha - helix and beta - pleats in proteins.
   Should know why haemoglobin is globular and keratin is fibrous.
4. Need not know mechanism of oxidative phosphorylation.
   Should know more than 90 % of ATP is formed by this process.
5. Need not know details of the conversion of pepsinogen to pepsin.
   Should know hydrochloric acid cannot break a peptide bond at room temperature.
6. Need not remember the steps of glycogenesis.
   Should know that excess intake of carbohydrate will not increase glycogen level in liver or muscle.
7. Need not know about urea or cretinine clearance tests.
   Should know the basis of increase of urea and creatinine in blood in renal insufficiency.
8. Need not know the structure of insulin.
   Should know why insulin level in circulation is normal in most cases of maturity onset diabetes.
9. Need not know the structural details of ATP.
   Should know why about 10 g of ATP in the body at any given time meets all the energy needs.
10. Need not know the mechanism of action of prolylhydroxylase.
    Should know why the gum bleeds in scurvy.
11. Need not know the structure of Vitamin K.
    Should know the basis of internal bleeding arising due to its deficiency.
12. Need not remember the structure of HMGCoA.
    Should know why it does not lead to increased cholesterol synthesis in starvation.

BIOCHEMISTRY AND NUTRITION

1. CHEMISTRY OF BIOORGANIC MOLECULES

Carbohydrates: Definition, biological importance and classification. Monosaccharides - Isomerism, anomerism. Sugar derivatives, Disaccharides. Polysaccharides. Structures of starch and glycogen.
Lipids : Definition, biological importance and classification. Fats and fatty acids. Introduction to compound lipids. Hydrophobic and hydrophilic groups. Cholesterol. Bile salts. Micelle. Bimolecular leaflet.

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Proteins: Biological importance. Aminoacids: Classification. Introduction to peptides. Proteins : Simple and conjugated; globular and fibrous. Charge properties. Buffer action . Introduction to protein conformation . Denaturation.
Nucleic acids: Building units . Nucleotides. Outline structure of DNA and RNA.
High energy compounds: ATP , Phosphorylamidines, Thiolesters, Enol phosphates.

2. MACRONUTERIENTS AND DIGESTION
Energy needs: Basal metabolic rate. Dietary carbohydrates, fibres. Dietary lipids, essential fatty acids. Nitrogen balance. Essential amino acids. Protein quality and requirement (methods for evaluation of protein quality to be excluded). Protein calorie malnutrition. Balanced diet.
Enzymatic hydrolysis of dietary carbohydrates. Mechanism of uptake of monosaccharides. Digestion and absorption of triacylglycerols. Enzymatic hydrolysis of dietary proteins and uptake of amino acids.

3. MICRONUTRIENTS
Vitamins: Definition, classification, daily requirement, sources and deficiency symptoms. Brief account of water-soluble vitamins with biochemical functions. Vitamins A functions including visual process. Vitamin D and its role in calcium metabolism. Vitamin E. Vitamin K and gamma carboxylation. Introduction to antivitamins and hypervitaminosis.

Minerals :Classification, daily requirement. Calcium and phosphate: sources, uptake, excretion, function. Serum calcium regulation. Iron: sources, uptake and transport.
Heme and nonheme iron functions; deficiency. Iodine: Brief introduction to thyroxine synthesis. General functions of thyroxine. Fluoride: function, deficiency and excess. Indications of role of other minerals.

4. ENERGY METABOLISM
Overview: Outlines of glycolysis, pyruvate oxidation and citric acid cycle. Beta oxidation of fatty acids. Electron transport chain and oxidative phosphyorylation. Ketone body formation and utilisation. Introduction to glycogenesis, glycogenolysis, fatty acid synthesis, lipogenesis and lipolysis. Gluconeogenesis. Lactate metabolism . Protein utilisation for energy. Glucogenic and ketogenic amino acids. Integration of metabolism.

5. SPECIAL ASPECTS OF METABOLISM
Importance of pentose phosphate pathway. Formation of glucuronic acid. Outlines of cholesterol synthesis and breakdown. Ammonia metabolism. Urea formation. Phosphocreatine formation. Transmethylation. Amines. Introduction to other functions of amino acids including one carbon transfer. Detoxication : Typical reactions. Examples of toxic compounds. Oxygen toxicity

6. BIOCHEMICAL GENETICS AND PROTEIN SYNTHESIS
Introduction to nucleotides; formation and degradation. DNA as genetic material. Introduction to replication and transcription. Forms and functions of RNA. Genetic code and mutation. Outline of translation process. Antimetabolites and antibiotics interfering in replication, transcription and translation. Introduction to cancer, viruses and oncogenes.

7. ENZYME AND METABOLIC REGULATION
Enzymes: Definition, classification, specificity and active site. Cofactors. Effect of pH, temperature and substrate concentration. Introduction to enzyme inhibitors, proenzymes and isoenzymes. Introduction to allosteric regulation, covalent modification and regulation by induction/repression.

Overview of hormones. Introduction to second messengers, cyclic AMP, calcium ion, inositol triphosphate. Mechanism of action of steroid hormones, epinephrine, glucagon and insulin in brief. Acid base regulation. Electrolyte balance.

8. STRUCTURAL COMPONENTS AND BLOOD PROTEINS
Connective tissue: Collagen and elastin. Glycosaminoglycans. Bone structure. Structure of membranes. Membrane associated processes in brief. Exocytosis and endocytosis. Introduction to cytoskeleton. Myofibril and muscle contraction in brief.

Haemoglobin: functions. Introduction to heme synthesis and degradation. Plasma proteins: classification and separation. Functions of albumin. A brief account of immunoglobulins. Plasma lipoproteins: Formation, function and turnover.

9. MEDICAL BIOCHEMISTRY
Regulation of blood glucose. Diabetes mellitus and related disorders. Evaluation of glycemic status. Hyperthyroidism and hypothyroidism: Biochemical evaluation. Hyperlipoproteinemias and atherosclerosis, Approaches to treatment. Jaundice: Classification and evaluation. Liver function tests: Plasma protein pattern, serum enzymes levels. Brief introduction to kidney function tests and gastric function tests. Acid base imbalance. Electrolyte imbalance: evaluation. Gout. Examples of genetic disorders including lysosomal storage disorders, glycogen storage disorders, glucose 6- phosphate dehydrogenase deficiency, hemoglobinopathies, inborn errors of amino acid metabolism and muscular dystrophy (one or two examples with biochemical basis will be adequate). Serum enzymes in diagnosis.

PRACTICALS: Contact hours 50

1. Qualitative analysis of carbohydrates 4
2. Color reactions of proteins and amino acids 4

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3. Identification of nonprotein nitrogen substance	4
4. Normal constituents of urine	4
5. Abnormal constituents of urine	4
6. Analysis of saliva including amylase	2
7. Analysis of milk Quantitative estimations	2
8. Titrable acidity and ammonia in urine	2
9. Free and total acidity in gastric juice	2
10. Blood glucose estimation	2
11. Serum total protein estimation	2
12. Urine creatinine estimation Demonstration	2
13. Paper electrophoresis charts/clinical data evaluation	2
14. Glucose tolerance test profiles	2
15. Serum lipid profiles	1
16. Profiles of hypothyrodisim and hyperthyrodisim	1
17. Profiles of hyper and hypoparathyrodism	1
18. Profiles of liver function	1
19. Urea, uric acid creatinine profile in kidney disorders	1
20. Blood gas profile in acidosis/ alkalosis	1

RECOMMEDED BOOKS:

1. Concise text book of Biochemistry (3rd edition) 2001, T.N. Pattabiraman
2. Nutritional Biochemistry 1995, S. Ramakrishnan and S.V. Rao
3. lecture notes in Biochemistry 1984, J.K. Kandlish

Reference books:

1. Text book of Biochemistry with clinical correlations 1997, T.N. Devlin
2. Harper's Biochemistry, 1996., R.K. Murray et.al
3. Basic and applied Dental Biochemistry, 1979, R.A.D. Williams & J.C.Elliot

3. DENTAL ANATOMY, EMBRYOLOGY AND ORAL HISTOLOGY

INTRODUCTION

Dental Anatomy including Embryology and Oral Histology – a composite of basic Dental Sciences & their clinical applications.

SKILLS

The student should acquire basic skills in :

1. Carving of crowns of permanent teeth in wax.
2. Microscopic study of Oral tissues.
3. Identification of Deciduous & Permanent teeth.
4. Age estimation by patterns of teeth eruption from plaster casts of different age groups.

OBJECTIVES

After a course on Dental Anatomy including Embryology and Oral Histology,

1. The student is expected to appreciate the normal development, morphology, structure & functions of oral tissues & variations in different pathological/non-pathological states.
2. The student should understand the histological basis of various dental treatment procedures and physiologic ageing process in the dental tissues.
3. The students must know the basic knowledge of various research methodologies.

I. TOOTH MORPHOLOGY

1. Introduction to tooth morphology:
   - Human dentition, types of teeth, & functions, Palmer's & Binomial notation systems, tooth surfaces, their junctions - line angles & point angles, definition of terms used in dental morphology, geometric concepts in tooth morphology, contact areas & embrasures - Clinical significance.
2. Morphology of permanent teeth :
   - Description of individual teeth, along with their endodontic anatomy & including a note on their chronology of development, differences between similar class of teeth & identification of individual teeth.
   - Variations & Anomalies commonly seen in individual teeth.
3. Morphology of Deciduous teeth :
   - Generalized differences between Deciduous & Permanent teeth.
   - Description of individual deciduous teeth, including their chronology of development, endodontic anatomy, differences between similar class of teeth & identification of individual teeth.
4. Occlusion :
   - Definition, factors influencing occlusion - basal bone, arch, individual teeth, external & internal forces & sequence of eruption.
   - Inclination of individual teeth - compensatory curves.
   - Centric relation & Centric occlusion - protrusive, retrusive & lateral occlusion.
   - Clinical significance of normal occlusion.
   - Introduction to & Classification of Malocclusion.

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II. ORAL EMBRYOLOGY

1. Brief review of development of face, jaws, lip, palate & tongue, with applied aspects.
2. Development of teeth :
- Epithelial mesenchymal interaction, detailed study of different stages of development of crown, root & supporting tissues of tooth & detailed study of formation of calcified tissues.
- Applied aspects of disorders in development of teeth.
3. Eruption of deciduous & Permanent teeth :
- Mechanisms in tooth eruption, different theories & histology of eruption, formation of dentogingival junction, role of gubernacular cord in eruption of permanent teeth.
- Clinical or Applied aspects of disorders of eruption.
4. Shedding of teeth :
- Factors & mechanisms of shedding of deciduous teeth.
- Complications of shedding.

III. ORAL HISTOLOGY

1. Detailed microscopic study of Enamel, Dentine, Cementum & Pulp tissue. Age changes & Applied aspects (Clinical and forensic significance) of histological considerations - Fluoride applications, transparent dentine, dentine hypersensitivity, reaction of pulp tissue to varying insults to exposed dentine ; Pulp calcifications & Hypercementosis.
2. Detailed microscopic study of Periodontal ligament & alveolar bone, age changes, histological changes in periodontal ligament & bone in normal & orthodontic tooth movement, applied aspects of alveolar bone resorption.
3. Detailed microscopic study of Oral Mucosa, variation in structure in relation to functional requirements, mechanisms of keratinization, clinical parts of gingiva, Dentogingival & Mucocutaneous junctions & lingual papillae. Age changes & clinical considerations.
4. Salivary Glands :
- Detailed microscopic study of acini & ductal system.
- Age changes& clinical considerations.
5. TM Joint :
- Review of basic anatomical aspects & microscopiuc study & clinical considerations.
6. Maxillary Sinus :
- Microscopic study, anatomical variations, functions & clinical relevance of maxillary sinus in dental practice.
7. Processing of Hard & soft tissues for microscopic study :
- Ground sections, decalcified sections & routine staining procedures.
8. Basic histochemical staining patterns of oral tissues.

IV. ORAL PHYSIOLOGY

1. Saliva :
- Composition of saliva - variations, formation of saliva & mechanisms of secretion, salivary reflexes, brief review of secretomotor pathway, functions, role of saliva in dental caries & applied aspects of hyper & hypo salivation.
2. Mastication :
- Masticatory force & its measurement - need for mastication, peculiarities of masticatory muscles, masticatory cycle, masticatory reflexes & neural control of mastication.
3. Deglutition :
- Review of the steps in deglutition, swallowing in infants, neural control of deglutition & dysphagia.
4. Calcium, Phosphorous & fluoride metabolism :
- Source, requirements, absorption, distribution, functions & excretion, clinical considerations, hypo & hypercalcemia & hyper & hypo phosphatemia & fluorosis.
5. Theories of Mineralization :
- Definition, mechanisms, theories & their drawbacks.
- Applied aspects of physiology of mineralization, pathological considerations - calculus formation.
6. Physiology of Taste :
- Innervation of taste buds & taste pathway, physiologic basis of taste sensation, age changes & applied aspects - taste disorders.
7. Physiology of Speech :
- Review of basic anatomy of larynx & vocal cords.
- Voice production, resonators, production of vowels & different consonants - Role of palate, teeth & tongue.
- Effects of dental prosthesis & appliances on speech & basic speech disorders.

RECOMMENDED TEXT BOOKS

1. Orban's Oral Histology & Embryology - S.N.Bhaskar
2. Oral Development & Histology - James & Avery
3. Wheeler's Dental Anatomy, Physiology & Occlusion - Major.M.Ash
4. Dental Anatomy - its relevance to dentistry - Woelfel & Scheid
5. Applied Physiology of the mouth - Lavelle
6. Physiology & Biochemistry of the mouth - Jenkins

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4. GENERAL PATHOLOGY

AIM:

At the end of the course the student should be competent to:
Apply the scientific study of disease processes, which result in morphological and functional alterations in cells, tissues and organs to the study of pathology and the practice of dentistry.

OBJECTIVES:

Enabling the student

1. To demonstrate and apply basic facts, concepts and theories in the field of Pathology.
2. To recognize and analyze pathological changes at macroscopically and microscopical levels and explain their observations in terms of disease processes.
3. To Integrate knowledge from the basic sciences, clinical medicine and dentistry in the study of Pathology.
4. To demonstrate understanding of the capabilities and limitations of morphological Pathology in its contribution to medicine, dentistry and biological research.
5. To demonstrate ability to consult resource materials outside lectures, laboratory and tutorial classes.

COURSE CONTENT

A. General Pathology –

1. Introduction to Pathology
   Terminologies
   The cell in health
   The normal cell structure
   The cellular functions
2. Etiology and Pathogenesis of Disease
   Cell Injury
   Types – congenital
   Acquired
   Mainly Acquired causes of disease
   (Hypoxic injury, chemical injury, physical injury, immunological injury)
3. Degenerations
   Amyloidosis
   Fatty change
   Cloudy swelling
   Hyaline change, mucoid degeneration
4. Cell death & Necrosis
   Apoptasis
   Def, causes, features and types of necrosis
   Gangrene - Dry, wet, gas
   Pathological Calcifications
   (Dystrophic and metastatic)
5. Inflammation
   - Definition, causes types, and features
   - Acute inflammation
   a. The vascular response
   b. The cellular response
   c. Chemical mediators
   d. The inflammatory cells
   e. Fate
   - Chronic inflammation
   Granulomations inflammation
6. Healing
   - Regeneration
   - Repair
   a. Mechanisms
   b. Healing by primary intention
   c. Healing by secondary intention
   d. Fracture healing
   e. Factors influencing healing process
   f. Complications
7. Tuberculosis
   - Epidemiology
   - Pathogenesis (Formation of tubercle)
   - Pathological features of Primary and secondary TB
   - Complications and Fate
8. Syphilis
   - Epidemiology
   - Types and stages of syphilis

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- Pathological features
- Diagnostic criterias
- Oral lesions

9. Typhoid
   - Epidemiology
   - Pathogenesis
   - Pathological features
   - Diagnostic criterias
10. Thrombosis
    - Definition, Pathophysiology
    - Formation, complications & Fate of a thrombus
11. Embolism
    - Definition
    - Types
    - Effects
12. Ischaemia and Infraction
    - Definition, etiology, types
    - Infraction of various organs
13. Derangements of body fluids
    - Oedema – pathogenesis
      Different types
14. Disorders of circulation
    - Hyperaemia
    - Shock
15. Nutritional Disorders
    - Common Vitamin Deficiencies
16. Immunological mechanisms in disease
    - Humoral & cellular immunity
    - Hypersensitivity & autommunity
17. AIDS and Hepatitis.
18. Hypertension
    - Definition, classification
    - Pathophysiology
    - Effects in various organs
19. Diabetes Mellitus
    - Def, Classification, Pathogenesis, Pathology in different organs
20. Adaptive disorders of growth
    - Atrophy & Hypertrophy, Hyperplasia, Metaplasia and Dysplasia
21. General Aspects of neoplesia
    a. Definition, terminology, classification
    b. Differences between benign and malignant neoplasms
    c. The neoplastic cell
    d. Metastasis
    e. Etiology and pathogenesis of neoplasia, Carcinogenesis
    f. Tumour biology
    g. Oncogenes and anti-oncogenes
    h. Diagnosis
    i. Precancerous lesions
    j. Common specific tumours, Sq papilloma & Ca, Basal cell Ca, Adenoma & Adenoca, Fibroma & Fibrosarcoma, Lipoma and liposarcoma

B. Systemic Pathology –

22 Anaemias
- Iron Deficiency anaemia, Megaloblastic anaemia

23.Leukaemias
- Acute and chronic leukaemias, Diagnosis and clinical features

24. Diseases of Lymph nodes
- Hodgkin's disease, Non Hodgkins lymphoma, Metastatic carcinoma

25. Diseases of oral cavity
- Lichen planus, Stomatitis, Leukoplakia, Sq cell Ca, Dental caries, Dentigerious cyst, Ameloblastoma

26. Diseases of salivary glands
- Normal structure, Sialadenitis, Tumours

27. Common diseases of Bones
- Osteomyelitis, Metabolic bone diseases, Bone Tumours, Osteosarcoma, Osteocalstoma, Giant cell Tumour, Ewing's sarcoma, Fibrous dysplasia, Aneurysmal bone cyst

28.Diseases of Cardiovascular system
- Cardiac failuare
- Congenital heart disease – ASD, VSD,PDA
  Fallot's Tetrology

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- Infective Endocarditis
- Atherosclerosis
- Ischaemic heart Disease

29. Haemorrhagic Disorders
Coagulation cascade
Coagulation disorders
- Platelet funtion
- Platelet disorders

Practicals
1.Urine – Abnormal constitutients
- Sugar, albumin, ketone bodies

2. Urine – Abnormal consittuents
- Blood, bile salts, bile pigments

3. Haemoglobin (Hb) estimation
4. Total WBC count
5. Differential WBC Count
6. Packed cell volume(PCV,) rythrocyte sedimentation Rate (ESR)
7. Bleeding Time & clotting Time
8. Histopathology
Tissue Processing
Staining
9.Histopathology slides
- Acute appendicitis, Granulation tissue, fatty liver

10. Histopathology slides
CVC lung, CVC liver, Kidney amyloidosis
11. Histopathology slides
Tuberculosis, Actionomycosis, Rhinosporidiosis
12. Histopathology slides
Papilloma, Basal cell Ca, Sq cell Ca
13. Histopathology slides
Osteosarcoma, osteoclastoma, fibrosarcoma
14. Histopathology slides
Malignant melanoma, Ameloblastoma, Adenoma
15. Histopathology slides
Mixed parotid tumour, metastatic
carcinoma in lymph node

List of Textbooks

1. Robbins – Pathologic Basis of Disease Cotran, Kumar, Robbins
2. Anderson's Pathology Vol 1 & 2 Editors – Ivan Damjanov & James Linder
3. Wintrobe's clinical Haematolog Lee, Bithell, Foerster, Athens, Lukens

MICROBIOLOGY

AIM:

To introduce the students to the exciting world of microbes. To make the students aware of various branches of microbiology, importance, significance and contribution of each branch to mankind and other fields of medicine. The objectives of teaching microbiology can be achieved by various teaching techniques such as :

a) Lectures
b) Lecture Demonstrations
c) Practical exercises
d) Audio visual aids
e) Small group discussions with regular feed back from the students.

OBJECTIVES:

A. KNOWLEDGE AND UNDERSTANDING

At the end of the Microbiology course the student is expected to :

1. Understand the basics of various branches of microbiology and able to apply the knowledge relevantly.
2. Apply the knowledge gained in related medical subjects like General Medicine and General Surgery and Dental subjects like Oral Pathology, Community Dentistry, Periodontics, Oral Surgery, Pedodontics, Conservative Dentistry and Oral medicine in higher classes.
3. Understand and practice various methods of Sterilisation and disinfection in dental clinics.
4. Have a sound understanding of various infectious diseases and lesions in the oral cavity.

A. SKILLS

1. Student should have acquired the skill to diagnose, differentiate various oral lesions.
2. Should be able to select, collect and transport clinical specimens to the laboratory.
3. Should be able to carry out proper aseptic procedures in the dental clinic.

A brief syllabus of Microbiology is given as follows:

A. GENERAL MICROBIOLOGY:

1. History, Introduction, Scope, Aims and Objectives.
2. Morphology and Physiology of bacteria.
3. Detail account of Sterlisation and Disinfection.
4. Brief account of Culture media and Culture techniques.
5. Basic knowledge of selection, collection, transport, processing of clinical Specimens and identification of bacteria.
6. Bacterial Genetics and Drug Resistance in bacteria.

B. IMMUNOLOGY:

1. Infection - Definition, Classification, Source, Mode of transmission and types of Infectious disease.
2. Immunity
3. Structure and functions of Immune system
4. The Complement System
5. Antigen
6. Immunoglobulins - Antibodies - General structure and the role played in defense mechanism of the body.
7. Immune response
8. Antigen - Antibody reactions - with reference to clinical utility.
9. Immuno deficiency disorders - a brief knowledge of various types of immuno deficiency disorders - A sound knowledge of immuno deficiency disorders relevant to dentistry.
10. Hypersensitivity reactions
11. Autoimmune disorders - Basic knowledge of various types - sound knowledge of autoimmune disorders of oral cavity and related structures.
12. Immunology of Transplantation and Malignancy
13. Immunehaematology

C. SYSTEMATIC BACTERIOLOGY:

1. Pyogenic cocci - Staphylococcus, Streptococcus, Pneumococcus, Gonococcus, Meningococcus – brief account of each coccus - detailed account of mode of spread, laboratory diagnosis, Chemo therapy and prevention - Detailed account of Cariogenic Streptococci.
2. Corynebacterium diphtheriae - mode of spread, important clinical feature, Laboratory diagnosis, Chemotherapy and Active immunisation.
3. Mycobacteria - Tuberculosis and Leprosy
4. Clostridium - Gas gangrene, food poisoning and tetanus.
5. Non-sporing Anaerobes - in brief about classification and morphology, in detail about dental pathogens - mechanism of disease production and prevention.
6. Spirochaetes - Treponema pallidum - detailed account of Oral Lesions of syphilis, Borrelia vincentii.
7. Actinomycetes.

D. VIROLOGY:

1. Introduction
2. General properties, cultivation, host - virus interaction with special reference to Interferon.
3. Brief account of Laboratory diagnosis, Chemotherapy and immuno prophylaxis in general.
4. A few viruses of relevance to dentistry.

- Herpes Virus
- Hepatitis B Virus - brief about other types
- Human Immunodeficiency Virus (HIV)
- Mumps Virus
- Brief - Measles and Rubella Virus

5. Bacteriophage - structure and Significance

E. MYCOLOGY

1. Brief Introduction
2. Candidosis - in detail
3. Briefly on oral lesions of systemic mycoses.

F. PARASITOLOGY:

1. Brief introduction - protozoans and helminths
2. Brief knowledge about the mode of transmission and prevention of commonly seen parasitic infection in the region.

RECOMMENDED BOOKS FOR REGULAR READING:

1. Text book of Microbiology – R.Ananthanarayan & C.K.Jayaram Paniker.
2. Medical Microbiology – David Greenwood etal.

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BOOKS FOR FURTHER READING/REFERENCE.

i) Microbiology – Prescott, etal.
ii) Microbiology – Bernard D. Davis , etal.
iii) Clinical & Pathogenic Microbiology – Barbara J Howard, etal.
iv) Mechanisms of Microbial diseases – Moselio Schaechter, etal.
v) Immunology an Introduction – Tizard
vi) Immunology 3rd edition – Evan Roitt , etal.

5. GENERAL AND DENTAL PHARMACOLOGY AND THERAPEUTICS

GOAL:

The broad goal of teaching under graduate students in pharmacology is to inculcate rational and scientific basis of therapeutics keeping in view of dental curriculum and Profession.

OBJECTIVES:

At the end of the course the student shall be able to:

i) Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs in general and in dentistry in particular.
ii) List the indications, contraindications; interactions, and adverse reactions of commonly used drugs with reason.
iii) Tailor the use of appropriate drugs in disease with consideration to its cost, efficacy, safety for individual and mass therapy needs.
iv) Indicate special care in prescribing common and essential drugs in special medical situations such as pregnancy, lactation, old age, renal, hepatic damage and immuno compromised patients.
v) Integrate the rational drug therapy in clinical pharmacology.
vi) Indicate the principles underlying the concepts of "Essential drugs".

SKILLS:

At the end of the course the student shall be able to:

1) Prescribe drugs for common dental and medical ailments.
2) To appreciate adverse reactions and drug interactions of commonly used drugs.
3) Observe experiments designed for study of effects of drugs.
4) Critically evaluate drug formulations and be able to interpret the clinical pharmacology of marketed preparations commonly used in dentistry.

5) INTEGRATION: Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical departments.

LECTURE:

I. GENERAL PHARMACOLOGY:

1. General principles of pharmacology; sources and nature of drugs dosage forms; prescription writing; pharmacokinetics (absorption, distribution, metabolism and excretion of drugs), mode of action of drugs, combined effects of drugs, receptor mechanism of drug action, factors modifying drug response, adverse drug reactions; drug interactions, Implications of General Principles in clinical dentistry.
2. CNS drugs; General anaesthetics, hypnotics, analgescis psychotropic drugs, anti – epileptics, muscle relaxants, local anaesthetics, Implications of these drugs in clinical dentistry.
3. Autonomic drugs; sympathomimetics, antiadrenergic drugs parasympothomimetics and parasympatholytics, Implications of Autonomic drugs in clinical dentistry.
4. Cardiovascular drugs; Cardiac stimulants ; antihypertensive drugs, vasopressor agents, treatment of shock, Antianginal agents and diuretics, Implications of these drugs in clinical dentistry.
5. Autocoids:
   Histamine, antihistamines, prostaglandins, leukotriens and bronchodilators, Implications of Autocoids in clinical dentistry.
6. Drugs acting on blood : coagulants and anticoagulants, hematinics, Implications of these drugs in clinical dentistry.
7. G.I.T. Drugs, Purgatives, anti-diarrhoeal, antacids, anti-emetics, Implications of these drugs in clinical dentistry.
8. Endocrines; Emphasis on treatment of diabetes and glucocorticoids, thyroid and antithyroid agents, drugs affecting calcium balance and anabolic steroids, Implications of these drugs in clinical dentistry.
9. Chemotherapy: Antimicrobial agents (against bacteria, anaerobic infections, fungi, virus and broad spectrum). Infection management in dentistry. Phamacotherapy of Tuberculosis, leprosy and chemotherapy of malignancy in general. Implications of Chemotherpy in clinical dentistry.
10. Vitamins : Water soluble vitamins, Vit. D, Vit.K. and Vit. E, Implications of Vitamins in clinical dentistry.
11. Pharmacotherapy of emergencies in dental office and emergency drugs tray Implications of Pharmacotherapy in clinical dentistry.
12. Chealating agents – BAL,EDTA and desferrioxamine,

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II. DENTAL PHARMACOLOGY

1. Anti - septics, astrigents, obtundents, mummifying agents, bleaching agents, styptics, disclosing agents, dentifrices, mouth washes, caries and fluorides.
2. Pharmacotherapy of common oral conditions in dentistry.
   Practicals and Demonstrations :
   To familiarise the student with the methodology: prescription writing and dispensing. Rationale of drug combinations of marketed drugs.

LIST OF BOOKS RECOMMENDED FOR READING AND REFERENCE

1. R.S.Satoskar, Kale Bhandarkar's Pharmacology and Pharmacolherapentics, 10th Edition, Bombay Popular Prakashan 1991.
2. Bertam G Katzung, Basic and Clinical pharmacology 6th ed. Appleton & Lange 1997.
3. Lauerence D.R. Clinical Pharmacology 8th ed. Churchill Livingstone 1997.
4. Satoskar R.S. & Bhandarkar S.D., Pharmacology and Pharmacotherapeutics part I & part ii, 13th Popular Prakashan Bombay 1993.
5. Tripathi K.D., Essentials of Medical Pharmacology 4th ed Jaypee Brothers 1999.

6. DENTAL MATERIALS

The science of Dental Material has undergone tremendous changes over the years. Continued research has led to new material systems and changing concepts in the dental field. Interlinked with various specialised branches of chemistry, practically all engineering applied sciences and biological characteristics, the science of dental material emerged as a basic sciences in itself with its own values and principles.

INTRODUCTION

AIMS:

Aim of the course is to present basic chemical and physical properties of Dental materials as they are related to its manipulation to give a sound educational background so that the practice of the dentistry emerged from art to empirical status of science as more information through further research becomes available. It is also the aim of the course of Dental materials to provide with certain criteria of selection and which will enable to discriminate between facts and propaganda with regards to claims of manufactures.

OBJECTIVES:

To understand the evolution and development of science of dental material.
To explain purpose of course in dental materials to personnels concerned with the profession of the dentistry. Knowledge of physical and chemical properties. Knowledge of biomechanical requirements of particular restorative procedure. An intelligent compromise of the conflicting as well as co-ordinating factors into the desired Ernest. Laying down standards or specifications of various materials to guide to manufacturers as well as to help professionals.
Search for newer and better materials which may answer our requirements with greater satisfaction. To understand and evaluate the claims made by manufactures of dental materials

NEEDS FOR THE COURSE:

The profession has to rise from an art to a science, , the need for the dentist to possess adequate knowledge of materials to exercises his best through knowledge of properties of different types of materials. The growing concern of health hazards due to mercury toxicity, inhalation of certain vapour or dust materials, irritations and allergic reaction to skin due to contact of materials. Materials causing irritation of oral tissues, pH of restorative materials causing inflammation and necrosis of pulp which is a cause for the dentist to posses wider knowledge of physical, chemical and biological properties of materials being used. For the protection for the patient and his own protection certain criteria of selection are provided that will enable the dentist to discriminate between facts and propaganda, which will make a material biologically accept.

SCOPE:

The dental materials is employed in mechanical procedures including restorative dentistry such as Prosthodontics, endodontics, periodontal, orthodontics and restorative materials. There is scarcely a dental procedure that does not make use of dental materials in one form or another and therefore the application of dental material is not limited to any one branch of dentistry. Branches such as minor surgery and periodontics require less use of materials but the physical and chemical characters of materials are important in these fields.
The toxic and tissue reaction of dental materials and their durability in the oral cavity where the temperature is between 32 & 37 degree centigrade, and the ingestion of hot or cold food ranges from 0-70 degree centigrade. The acid an alkalinity of fluids shown pH varies from 4 to 8.5. The load on 1 sq. mm of tooth or restorative materials can reach to a level as high as many kilograms. Thus the biological properties of dental materials cannot be separated from their physical and chemical properties.

2). STRUCTURE OF MATTER AND PRINCIPLES OF ADHESION.

Change of state, inter atomic primary bonds, inter atomic secondary bonds, inter atomic bond distance and bonding energy, thermal energy, crystalline structure, non crystalline structures, diffusion, adhesion and bonding and adhesion to tooth structures.

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3). IMPORTANT PHYSICAL PROPERTIES APPLICABLE TO DENTAL MATERIALS

Physical properties are based on laws of mechanics, acoustics, optics, thermodynamics, electricity, magnetism, radiation, atomic structure or nuclear phenomena. Hue, value, chroma and translucency physical properties based on laws of optics, dealing with phenomena of light, vision and sight. Thermal conductivity & coefficient of thermal expansion are physical properties based on laws of thermodynamics. Stress, strain, proportional limit, elastic limit yield strength, modulus of elasticity, flexibility, resilience, impact, impact strength, permanent deformation, strength, flexure strength fatigue, static fatigue, toughness, brittleness, ductility & malleability, hardness, abrasion resistance, relaxation, rheology, Thixotropic, creep, static creep, dynamic creep, flow, colour, three dimensional colour – hue, values, chroma, Munsell system, metamersim, fluorescence, physical properties of tooth, stress during mastication

4). BIOLOGICAL CONSIDERATIONS IN USE OF DENTAL MATERIALS.

Materials used are with the knowledge of appreciation of certain biological considerations for use in oral cavity. Requirement of materials with biological compatibility. Classification of materials from perspective of biological compatibility. eg. contact with soft tissues, affecting vitality of pulp, used for root canal fillings, affecting hard tissues of teeth, laboratory materials that could be accidentally be inhaled or ingested during handling. Hazards associated with materials: pH-effecting pulp, polymers causing chemical irritation, mercury toxicity, etc. Microleakage, Thermal changes, Galvanism, toxic effect of materials. Biological evaluation for systemic toxicity, skin irritation, mutagenecity and carcinogenicity. Disinfection of dental materials for infection control.

5). GYPSUM & GYPSUM PRODUCTS.

Gypsum – its origin, chemical formula, Products manufactured from gypsum.
Dental plaster, Dental stone, Die stone, high strength, high expansion stone.
Application and manufacturing procedure of each, macroscopic and microscopic structure of each .
Supplied as and Commercial names.
Chemistry of setting, setting reaction, theories of setting, gauging water, Microscopic structure of set material.
Setting time: working time and setting time, Measurement of setting time and factors controlling setting time .
Setting expansion, Hygroscopic setting expansion – factors affecting each
Strength :wet strength, dry strength, factors affecting strength, tensile strength
Slurry – need and use.
Care of cast.
ADA classification of gypsum products
Description of impression plaster and dental investment
Manipulation including recent methods or advanced methods.
Disinfection : infection control, liquids, sprays, radiation
Method of use of disinfectants
Storage of material – shelf life

6) IMPRESSION MATERIALS USED IN DENTISTRY

Impression plaster, Impression compound, Zinc oxide eugenol impression paste & bite registration paste incl., non eugenol paste, Hydrocolloids, reversible and irreversible, Elastomeric impression materials. Polysulphide, Condensation silicones, Addition silicones, Polyether, Visible light cure polyether urethane dimethacrylate, Historical background & development of each impression material,
Definition of impression , Purpose of making impression, Ideal properties required and application of material, Classification as per ADA specification, general & individual impression material.
Application and their uses in different disciplines, Marketed as and their commercial names, Mode of supply & mode of application bulk/wash impression. Composition, chemistry of setting ,Control of setting time , Type of impression trays required, Adhesion to tray, manipulation, instruments & equipments required. Techniques of impression, storage of impression, (Compatibility with cast and die material). Any recent advancements in material and mixing devices. Study of properties: Working time, setting time, flow, accuracy, strength, flexibility, tear strength, dimensional stability, compatibility with cast & die materials incl., electroplating Biological properties: tissue reaction , Shelf life & storage of material, Infection control – disinfection, Advantages & disadvantages of each material.

7). SYNTHETIC RESINS USED IN DENTISTRY.

Historical background and development of material, Denture base materials and their classification and requirement
Classification of resins
Dental resins – requirements of dental resins, applications, polymerisation, polymerisation mechanism stages in addition polymerisation, inhibition of polymerisation, co polymerization, molecular weight, crosslinking, plastixizers, Physical properties of polymers, polymer structures types of resins.
ACRYLIC RESINS:
Mode of polymerisation: Heat activated, Chemically activated, Light activated, Mode of supply, application, composition, polymerisation reaction of each. Technical considerations: Methods of manipulation for each type of resin. Physical properties of denture base resin. Miscellaneous resins & techniques: Repair resins, Relining and rebasing. Short term and long-term soft-liners, temporary crown

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and bridge resins, Resin impression trays, Tray materials, Resin teeth, materials in maxillofacial prosthesis, Denture cleansers, Infection control in detail, Biological properties and allergic reactions.

RESTORATIVE RESINS:
Historical background, Resin based restorative materials, Unfilled & filled, Composite restorative materials, Mode of supply, Composition, Polymerisation mechanisms: Chemically activated, Light activated, Dual cure: Degree of conversion, Polymerisation shrinkage Classification of Composites: Application, composition and properties of each Composites of posterior teeth, Prosthodontics resins for veneering. Biocompatibility – microleakage, pulpal reaction, pulpal protection Manipulation of composites: Techniques of insertion of Chemically activated, light activated, dual cure Polymerisation, Finishing and polishing of restoration, Repair of composites Direct bonding Bonding: Need for bonding, Acid - etch technique, Enamel bonding, Dentin bonding agents. Mode of bonding, Bond strength, Sandwich technique its indication and procedure. Extended application for composites: Resins for restoring eroded teeth, Pit and fissure sealing, Resin inlays system – Indirect & direct, Core build up, Orthodontic applications.

8). METAL AND ALLOYS:
Structure and behaviour of metals, Solidification of metals, mechanism of crystallisation amorphous & crystalline. Classification of alloys, Solid solutions, Constitutes or equilibrium phase diagrams:Electric alloys, Physical properties, Peritectic alloys, Solid state reaction other binary systems: Metallography & Heat treatment. Tarnish and corrosion. Definition: causes of corrosion, protection against corrosion., Corrosion of dental restorations, clinical significance of galvanic current. Dental Amalgam.

History:
Definition of dental amalgam, application, Alloy classification, manufacture of alloy powder composition - available as.
Amalgamation : setting reaction & resulting structure , properties , Microleakage
Dimensional stability, Strength, Creep, Clinical performance
Manipulation: Selection of alloy, proportioning, mechanism of trituration, condensation, carving & finishing. Effect of dimensional changes, Marginal deterioration., Repair of amalgam, mercury toxicity, mercury hygiene.

DIRECT FILLING GOLD:
Properties of pure gold, mode of adhesion of gold for restoration forms of direct filling gold for using as restorative material
Classification : Gold Foil, Electrolytic precipitate, powdered gold.
Manipulation: Removal of surface impurities and compaction of direct filling gold.
Physical properties of compacted gold, Clinical performance.

DENTAL CASTING ALLOYS:
Historical background, desirable properties of casting alloys.
Alternatives to cast metal technology: direct filling gold, amalgam, mercury free condensable intermetallic compound - an alternative to metal casting process. CAD-CAM process for metal & ceramic inlays - without need of impression of teeth or casting procedure, pure titanium, most bio compatible metal which are difficult to cast can be made into crowns with the aid of CAD- CAM technology . Another method of making copings - by copy milling (without casting procedures).
Classification of casting alloys: By function & description.
Recent classification , High noble (HN), Noble (N) and predominantly base metal (PB)
Alloys for crown & bridge, metal ceramic & removable partial denture. Composition, function, constituents and application, each alloy both noble and base metal. Properties of alloys: Melting range, mechanical properties, hardness, elongation, modulus of elasticity, tarnish and corrosion.
Casting shrinkage and compensation of casting shrinkage. Biocompatability - Handling hazards & precautions of base metal alloys, casting investments used. Heat treatment : Softening & hardening heat treatment. Recycling of metals. Titanium alloys & their application , properties & advantages. Technical considerations In casting . Heat source, furnaces.

9). DENTAL WAXES INCLUDING INLAY CASTING WAX
Introduction and importance of waxes. Sources of natural waxes and their chemical nature.
Classification of Waxes:
Properties: melting range, thermal expansion, mechanical properties, flow & residual stresses, ductility. Dental Wax: Inlay wax: Mode of supply : Classification & composition, Ideal requirements: Properties of inlay wax: Flow, thermal properties Wax distortion & its causes.
Manipulation of inlay wax: Instruments & equipment required, including electrically heated instruments metal tips and thermostatically controlled wax baths.
Other waxes: Applications, mode of supply & properties.
Casting Wax, Base plate wax, Processing wax, Boxing wax, Utility wax, Sticky wax, Impression wax for corrective impressions, Bite registration wax.

10). DENTAL CASTING INVESTMENTS.
Definition, requirements, classification
Gypsum bonded - classification. Phosphate bonded, Silica bonded
Mode of Supply: Composition, application , setting mechanism, setting time & factors controlling.

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Expansions :Setting expansion, Hygroscopic Setting expansion, & thermal expansion : factors affecting. Properties : Strength, porosity, and fineness & storage. Technical considerations: For Casting procedure, Preparation of die, Wax pattern, spruing, investing, control of shrinkage compensation, wax burnout, and heating the invested ring, casting. Casting machines, source of heat for melting the alloy. Defects in casting.

11). SOLDERING, BRAZING AND WELDING
Need of joining dental appliances, Terms & Definition
Solders: Definition, ideal requirement, types of solders – Soft & hard and their fusion temperature, application. Mode of supply of solders, Composition and selection, Properties. Tarnish & corrosion resistance mechanical properties, microstructure of soldered joint. Fluxes & Anti fluxes: Definition, Function, Types, commonly used fluxes & their selection Technique of Soldering & Brazing : free hand soldering and investment, steps and procedure. Welding,: Definition, application, requirements, procedure, weld decay - causes and how to avoid it. Laser welding.

WROUGHT BASE METAL ALLOYS

Applications and different alloys used mainly for orthodontics purpose

1. Stainless steel
2. Cobalt chromium nickel
3. Nickel titanium
4. Beta titanium

Properties required for orthodontic wires, working range, springiness, stiffness, resilience, Formability, ductility, ease of joining, corrosion resistance, stability in oral environment, bio compatibility
Stainless steels: Description, type, composition & properties of each type. Sensitisation & stabilisation , Mechanical properties – strength, tensile, yield strength, KHN. Braided & twisted wires their need , Solders for stainless steel, Fluxes, Welding

1. Wrought cobalt chromium nickel alloys, composition, allocation, properties, heat treatment, physical properties
2. Nickel – Titanium alloys, shape, memory & super elastic
3. Titanium alloys, application, composition, properties, welding, Corrosion resistance

12). DENTAL CEMENTS
Definition & Ideal requirements:
Cements: Silicate, Glass ionomer, metal modified glass ionomer, resin modified glass ionomer, zinc oxide eugenol, modified zinc oxide eugenol, zinc phosphate, zinc silico phosphate, zinc poly carboxylate, Cavity liners and cement bases, Varnishes Calcium hydroxide, Gutta percha

Application, classification (general and individual), setting mechanism, mode of supply, Properties, factors affecting setting, special emphasis on critical procedures of manipulation and protection of cement, mode of adhesion, biomechansim of caries inhibition.
Agents for pulpal protection., Modifications and recent advances, Principles of cementation. Special emphasis on cavity liners and cement bases and luting agents.

13). DENTAL CERAMICS
Historical background & General applications.
Dental ceramics : definition, classification, application, mode of supply, manufacturing procedure, methods of strengthening. Properties of fused ceramic: Strength and factors affecting, modulus of elasticity, surface hardness, wear resistance, thermal properties, specific gravity, chemical stability, esthetic properties, biocompatability, technical considerations.
Metal Ceramics (PFM): Alloys - Types and composition of alloys. Ceramic - Type and Composition.
Metal Ceramic Bond - Nature of bond. Bonding using electro deposition, foil copings, bonded platinum foil, swaged gold alloy foil coping. Technical considerations for porcelain and porcelain fused metal restorations. Recent advances - all porcelain restorations, Manganese core, injection moulded, castable ceramics, glass infiltrated alumina core ceramic (In ceram), ceramic veners, inlays and onlays, and CAD - CAM ceramic. Chemical attack of ceramic by fluoride. Porcelain furnaces.

14). ABRASION & POLISHING AGENTS
Definition of abrasion and polishing. Need of abrasion and polishing. Types of abrasives: Finishing, polishing & cleaning. Types of abrasives: Diamond, Emery, aluminium oxides garnet, pumice, Kieselgurh, tripoli, rouge, tin oxide, chalk, chromic oxide, sand, carbides, diamond, zirconium silicate Zinc oxide

ABRASIVE ACTION :
Desirable characteristics of an abrasive, Rate of abrasion, Size of particle, pressure and speed.
Grading of abrasive & polishing agents. Binder, Polishing materials & procedures used. Technical consideration - Material and procedure used for abrasion and polishin Electrolytic polishing and burnishing.

15). DIE AND COUNTER DIE MATERIALS INCLUDING ELECTROFORMING AND ELECTROPOLISHING.
Types – Gypsum products, Electroforming, Epoxy resin, Amalgam.

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16). DENTAL IMPLANTS : Evolution of dental implants, types and materials.
17). MECHANICS OF CUTTING : Burs and points.
At the end of the course the student should have the knowledge about the composition, properties, manipulative techniques and their various commercial names. The student should also acquire skills to select and use the materials appropriately for laboratory and clinical use.

RECOMMENDED BOOKS:
1. Phillips Science of Dental Materials – 10th edn.- Kenneth J. Anusavice
2. Restorative Dental Materials – 10 edn. Robert G.Craig
3. Notes on Dental Materials – E.C. Combe

7. PRE CLINICAL CONSERVATIVE DENTISTRY LABORATORY EXERCISES

1. Identification and study of handcutting instruments chisles, gingival margin trimmers, excavators and hatchet.
2. Identification and use of rotary cutting instruments in contra angle hand pieces burs (Micromotor)
3. Preparation class I and extended class I and class II and MOD's and class V amounting to 10 exercises in plaster models.
4. 10 exercises in mounted extracted teeth of following class I, 4 in number class I extended cavities 2, class II 4 in number and Class V 2 in number. Cavity preparation base application matrix and wedge placement restoration with amalgam.
5. Exercises on phantom head models which includes cavity preparation base and varnish application matrix and wedge placement followed by amalgam restoration.

Class I	5
Class I with extension	2
Class II	10
Class II Mods	2
Class V and III forglass ionmers	4
Class V for amalgam	2

6. Polishing of above restorations.
7. Demonstration of Class III and Class V cavity preparation. For composites on extracted tooth completing the restoration.
8. Polishing and finishing of the restoration of composites.
9. Identification and manipulation of varnish bases like Zinc Phosphate, Poly carboxylate, Glass Ionomers, Zinc Oxide, Euginol cements.
10. Identification and manipulation of various matrices, tooth separators and materials like composites and modified glassionomer cements.
11. Cast Restoration
    1. Preparation of Class II inlay cavity
    2. Fabrication of wax pattern
    3. Sprue for inner attachment investing
    4. Investing of wax pattern
    5. Finishing and cementing of class II inlay in extracted tooth.
12. Endodontics
    1. Identification of basic endodontic instruments
    2. Cornal access cavity preparation on extracted. Upper central incisiors
    3. Determination of working length.
    4. Biomechanical preparation of root canal space of central incisor
    5. Obfuration of root canal spaces. Absens of cornal access cavity.
    6. Closure of acess cavity

8. ORAL PATHOLOGY & ORAL MICROBIOLOGY

OBJECTIVES:
At the end of Oral Pathology & Oral Microbiology course, the student should be able to comprehend -
1. The different types of pathological processes, that involve the oral cavity.
2. The manifestations of common diseases, their diagnosis & correlation with clinical pathological processes.
3. An understanding of the oral manifestations of systemic diseases should help in correlating with the systemic physical signs & laboratory findings.
4. The student should understand the underlying biological principles governing treatment of oral diseases.
5. The principles of certain basic aspects of Forensic Odontology.

SKILLS:
1. Microscopic study of common lesions affecting oral tissues through microscopic slides & projection slides.
2. Study of the disease process by surgical specimens.
3. Study of teeth anomalies/polymorphisms through tooth specimens & plaster casts.
4. Microscopic study of plaque pathogens.
5. Study of haematological preparations (blood films) of anaemias & leukemias.

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6. Basic exercises in Forensic Odontology such as histological methods of age estimation and appearance of teeth in injuries.

1. INTRODUCTION:

♦ A bird's eye view of the different pathological processes involving the oral cavity & oral cavity involvement in systemic diseases to be brought out. Interrelationship between General Medicine & General Surgery & Oral pathology to be emphasized.

2. Developmental disturbances of teeth, jaws and soft tissues of oral & paraoral region :

♦ Introduction to developmental disturbances - Hereditary, Familial mutation, Hormonal etc. causes to be highlighted.

♦ Developmental disturbances of teeth - Etiopathogenesis, clinical features, radiological features & histopathological features as appropriate :-
The size, shape, number, structure & eruption of teeth & clinical significance of the anomalies to be emphasized.

♦ Forensic Odontology.

♦ Developmental disturbances of jaws - size & shape of the jaws.

♦ Developmental disturbances of oral & paraoral soft tissues - lip & palate - clefts, tongue, gingiva, mouth, salivary glands & face.

3. Dental Caries :

♦ Etiopathogenesis, microbiology, clinical features, diagnosis, histopathology, immunology, prevention of dental caries & its sequelae.

4. Pulp & Periapical Pathology & Osteomyelitis.

♦ Etiopathogenesis & interrelationship, clinical features, microbiology, histopathology & radiological features (as appropriate) of pulp & periapical lesions & osteomyelitis.

♦ Sequelae of periapical abscess - summary of space infections, systemic complications & significance.

5. Periodontal Diseases :

♦ Etiopathogenesis, microbiology, clinical features, histopathology & radiological features (as appropriate) of gingivitis, gingival enlargements & periodontitis. Basic immunological mechanisms of periodontal disease to be highlighted.

6. Microbial infections of oral soft tissues :

♦ Microbiology, defence mechanisms including immunological aspects, oral manifestations, histopathogy and laboratory diagnosis of common bacterial, viral & fungal infections namely :-
Bacterial : Tuberculosis, Syphilis, ANUG & its complications - Cancrum Oris.
Viral : Herpes Simplex, Varicella zoster, Measles, Mumps & HIV infection.
Fungal : Candidal infection. Apthous Ulcers.

7. Common non- inflammatory diseases involving the jaws :

♦ Etiopathogenesis, clinical features, radiological & laboratory values in diagnosis of :
Fibrous dysplasia, Cherubism, Osteogenesis Imperfecta, Paget's disease, Cleidocranial dysplasia, Rickets, Achondroplasia, Marfan's syndrome & Down's syndrome.

8. Diseases of TM Joint :

♦ Ankylosis, summary of different types of arthritis & other developmental malformations, traumatic injuries & myofascial pain dysfunction syndrome.

9. Cysts of the Oral & Paraoral region :

♦ Classification, etiopathogenesis, clinical features, histopathology, laboratory & radiological features (as appropriate) of Odontogenic cysts, Non-Odontogenic cysts, Pseudocysts of jaws & soft tissue cysts of oral & paraoral region.

10. Tumours of the Oral Cavity :

♦ Classification of Odontogenic, Non-Odontogenic & Salivary Gland Tumours. Etiopathogenesis, clinical features, histopathology, radiological features & laboratory diagnosis (as appropriate) of the following common tumours :-

a) Odontogenic - all lesions.
b) Non-odontogenic
- Benign Epithelial - Papilloma, Keratoacanthoma & Naevi.
- Benign Mesenchymal - Fibroma, Aggressive fibrous lesions, Lipoma, Haemangioma,Lymphangioma, Neurofibroma, Schwannoma, Chondroma, Osteoma & Tori.
- Malignant Epithelial - Basal Cell Carcinoma, Verrucous Carcinoma, Squamous Cell carcinoma & Malignant Melanoma.
- Malignant Mesenchymal - Fibrosarcoma, Osteosarcoma, Giant cell tumour, Chondrosarcoma, Angiosarcoma, Kaposi's sarcoma, Lymphomas , Ewing's sarcoma & Other Reticuloendothelial tumours.
c) Salivary Gland
- Benign Epithelial neoplasms - Pleomorphic Adenoma, Warthin's tumour, & Oncocytoma.
- Malignant Epithelial neoplasms - Adenoid Cystic Carcinoma, Mucoepidermoid Carcinoma, Acinic Cell Carcinoma & Adenocarcinomas.

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d) Tumours of Disputed Origin - Congenital Epulis & Granular Cell Myoblastoma.
e) Metastatic tumours - Tumors metastasizing to & from oral cavity & the routes of metastasis.

11. Traumatic, Reactive & Regressive lesions of Oral Cavity :
- Pyogenic & Giant cell granuloma, exostoses Fibrous Hyperplasia, Traumatic Ulcer & Traumatic Neuroma.
- Attrition, Abrasion, Erosion, Bruxism, Hypercementosis, Dentinal changes, Pulp calcifications & Resorption of teeth.
- Radiation effects of oral cavity, summary of Physical & Chemical injuries including allergic reactions of the oral cavity.
- Healing of Oral wounds & complications - Dry socket.

12. Non neoplastic Salivary Gland Diseases :
- Sialolithiasis, Sialosis, Sialadenitis, Xerostomia & Ptyalism.

13. Systemic Diseases involving Oral cavity :
- Brief review & oral manifestations, diagnosis & significance of common Blood, Nutritional, Hormonal & Metabolic diseases of Oral cavity.

14. Mucocutaneous Lesions :
- Etiopathogenesis, clinical features & histopathology of the following common lesions. Lichen Planus, Lupus Erythematosus, Pemphigus & Pemphigoid lesions, Erythema Multiforme, Psoriasis, Scleroderma, Ectodermal Dysplasia, Epidermolysis bullosa & White sponge nevus..

15. Diseases of the Nerves :
- Facial neuralgias - Trigeminal & Glossopharyngeal. VII nerve paralysis, Causalgia.
- Psychogenic facial pain & Burning mouth syndrome.

16. Pigmentation of Oral & Paraoral region & Discolouration of teeth :
- causes & clinical manifestations.

17. Diseases of Maxillary Sinus :
- Traumatic injuries to sinus, Sinusitis, Cysts & Tumours involving antrum.

18. a) ORAL PRECANCER – CANCER; Epidemiology, aetiology, clinical and histopatholotgical features, TNM classification. Recent advances in diagnosis, management and prevention.
b) Biopsy : Types of biopsy, value of biopsy, cytology, histo chemistry & frozen sections in diagnosis of oral diseases.

19. Principles of Basic Forensic Odontology (Pre-clinical Forensic Odontology):
- Introduction, definition, aims & scope.
- Sex and ethnic (racial) differences in tooth morphology and histological age estimation
- Determination of sex & blood groups from buccal mucosa / saliva.
- Dental DNA methods
- Bite marks, rugae patterns & lip prints.
- Dental importance of poisons and corrosives.
- Overview of forensic medicine and toxicology

RECOMMENDED BOOKS

1. A Text Book of Oral Pathology - Shafer, Hine & Levy.
2. Oral Pathology - Clinical Pathologic correlations - Regezi & Sciubba.
3. Oral Pathology - Soames & Southam.
4. Oral Pathology in the Tropics - Prabhu,Wilson,Johnson & Daftary

9. GENERAL MEDICINE

GUIDELINES:

Special emphasis should be given throughout on the importance of various diseases as applicable to dentistry.

1. Special precautions/ contraindication of anaesthesia and various dental procedures in different systemic diseases.
2. Oral manifestations of systemic diseases.
3. Medical emergencies in dental practice.

A dental student should be taught in such a manner he/she is able to record the arterial pulse, blood pressure and be capable of suspecting by sight and superficial examination of the body – diseases of the heart, lungs, kidneys, blood etc. He should be capable of handling medical emergencies encountered in dental practice.

THEORY SYLLABUS

CORE TOPICS (Must Know)	COLLATERAL TOPICS (Desirable to Know)
1. Aims of medicine Definitions of signs, symptoms, diagnosis, differential diagnosis treatment & prognosis.	
2. Infections. Enteric fever, AIDS, herpes simplex, herpes zoster, syphilis diphtheria.	Infectious mononucleosis mumps, measles, rubella, malaria.

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3. G.I.T. Stomatitis, gingival hyperplasia, dysphagia, acid peptic disease, jaundice, acute and chronic hepatitis, cirrhosis of liver ascites.	Diarrhea Dysentery Amoebiasis Malabsorhtion
4. CVS Acute rheumatic fever rheumatic valvular heart disease, hypertension, ischemic heart disease, infective endocarditis, common arrhythmias, congenital heart disease, congestive cardiac failure.	
5. RS Pneumonia, COPD, Pulmonary TB, Bronehial asthma	Lung Abscess Pleural effusion Pneumothorax Bronchiectasis Lung cancers.
6. Hematology Anemias, bleeding & clotting disorders, leukemias, lymphomas, agranulocytosis, splenomegaly, oral manifestations of hematologic disorders, generalized Lymphadenopathy.	
7. Renal System Acute nephritis Nephrotic syndrome	Renal failure
8. Nutrition Avitaminosis	Balanced diet PEM Avitaminosis
9. CNS Facial palsy, facial pain including trigeminal neuralgia, epilepsy, headache including migraine.	- Meningitis - Examination of comatose patient - Examination of cranial nerves.
10. Endocrines Diabetes Mellitus Acromegaly, Hypothyroidism, Thyrotoxicosis, Calcium metabolism and parathyroids.	Addison's disease, Cushing's syndrome.
11. Critical care Syncope, cardiac arrest, CPR, shock	Ac LVF ARDS

CLINICAL TRAINING:
The student must be able to take history, do general physical examination (including build, nourishment, pulse, BP, respiration, clubbing, cyanosis, jaundice, lymphadenopathy, oral cavity) and be able to examine CVS, RS and abdomen and facial nerve.

10. GENERAL SURGERY

AIMS:
To acquaint the student with various diseases, which may require surgical expertise and to train the student to analyze the history and be able to do a thorough physical examination of the patient. The diseases as related to head and neck region are to be given due importance, at the same time other relevant surgical problems are also to be addressed. At the end of one year of study the student should have a good theoretical knowledge of various ailments, and be practically trained to differentiate benign and malignant diseases and be able to decide which patient requires further evaluation.

1. HISTORY OF SURGERY:
   The development of surgery as a speciality over the years, will give the students an opportunity to know the contributions made by various scientists, teachers and investigators. It will also enable the student to understand the relations of various specialities in the practice of modern surgery.
2. GENERAL PRINCIPLES OF SURGERY:
   Introduction to various aspects of surgical principles as related to orodental diseases. Classification of diseases in general. This will help the student to understand the various diseases, their relevance to routine dental practice.
3. WOUNDS:
   Their classification, wound healing, repair, treatment of wounds, medico-legal aspects of accidental wounds and complications of wounds.
4. INFLAMMATION:
   Of soft and hard tissues. Causes of inflammation, varieties, treatment and sequelae.
5. INFECTIONS:
   Acute and chronic abscess skin infections, cellulitis, carbuncle, and erysepelas. Specific infections such as tetanus, gangrene, syphilis, gonorrhoea, tuberculosis, Actinomycosis, Vincents angina, cancrum oris. Pyaemia, toxaemia and septicaemia.
6. TRNSMISSABLE VIRAL INFECTIONS:

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HIV and Hepatitis B with special reference to their prevention and precautions to be taken in treating patients in a carrier state.

7. SHOCK AND HAEMORRHAGE:
Classification, causes, clinical features and management of various types of shock. Syncope, Circulatory collapse. Haemorrhage – different types, causes, clinical features and management. Blood groups, blood transfusion, precautions and complications of blood and their products. Hemophilia's, their transmission, clinical features and management especially in relation to minor dental procedures.

8. TUMOURS, ULCERS, CYSTS, SINUS AND FISTULAE:
Classification, clinical examination and treatment principles in various types of benign and malignant tumours, ulcers, cysts, sinus and fistulae.

9. DISEASES OF LYMPHATIC SYSTEM:
Especially those occurring in head and neck region. Special emphasis on identifying diseases such as tubercular infection, lymphomas, leukaemias, metastatic lymph node diseases.

10. DISEASES OF THE ORAL CAVITY:
Infective and malignant diseases of the oral cavity and oropharynx including salivary glands with special emphasis on preventive aspects of premalignant and malignant diseases of the oral cavity.

11. DISEASES OF LARYNX, NASOPHARYNX:
Infections and tumours affecting these sites. Indications, procedure and complications of tracheostmy.

12. NERVOUS SYSTEM:
Surgical problems associated with nervous system with special reference to the principles of peripheral nerve injuries, their regeneration and principles of treatment. Detailed description of afflictions of facial nerve and its management. Trigeminal neuralgia, its presentation and treatment.

13. FRACTURES:
General principles of fractures, clinical presentation and treatment with additional reference to newer methods of fracture treatment. Special emphasis on fracture healing and rehabilitation.

14. PRINCIPLES OF OPERATIVE SURGERY:
Principles as applicable to minor surgical procedures including detailed description of asepsis, antiseptics, sterilisation, principles of anaesthesia and principles of tissue replacement. Knowledge of sutures, drains, diathermy, cryosurgery and use of Laser in surgery.

15. ANOMOLIES OF DEVELOPMENT OF FACE:
Surgical anatomy and development of face. Cleft lip and cleft palate—principles of management.

16. DISEASES OF THYROID AND PARATHYROID:
Surgical anatomy, pathogenesis, clinical features and management of dysfunction of thyroid and parathyroid glands. Malignant diseases of the thyroid—classification, clinical features and management.

17. SWELLINGS OF THE JAW:
Differential diagnosis and management of different types of swellings of the jaw.

18. BIOPSY:
Different types of biopsies routinely used in surgical practice.
Skills to be developed by the end of teaching is to examine a routine swelling, ulcer and other related diseases and to perform minor surgical procedures such as draining an abscess, taking a biopsy etc.

11. CONSERVATIVE DENTISTRY AND ENDODONTICS

OBJECTIVES:

A. Knowledge and understanding
B. Skills and
C. Attitudes

A). Knowledge and under standing:
The graduate should acquire the following knowledge during the period of training.

i. To diagnose and treat simple restorative work for teeth.
ii. To gain knowledge about aesthetic restorative material and to translate the same to patients needs.
iii. To gain the knowledge about endodontic treatment on the basis of scientific foundation.
iv. To carry out simple endodontic treatment.
v. To carry out simple luexation of tooth and its treatment and to provide emergency endodontic treatment.

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SKILLS:

He should attain following skills necessary for practice of dentistry

i) To use medium and high speed hand pieces to carry out restorative work.
ii) Poses the skills to use and familiarise endodontic instruments and materials needed for carrying out simple endodontic treatment.
iii) To achieve the skills to translate patients esthetic needs along with function.

ATTITUDES:

i). Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life.
ii). Willingness to participate in CDE programme to update the knowledge and professional skill from time to time.
iii). To help and participate in the implementation of the national oral health policy.
iv). He should be able to motivate the patient for proper dental treatment at the same time proper maintenance of oral hygiene should be emphasise which will help to maintain the restorative work and prevent future damage.

INTRODUCTION :

Definition aims objectives of Conservative Dentistry scope and future of Conservative Dentistry.

1. Nomenclature Of Dentition:
   Tooth numbering systems A.D.A. Zsigmondy Palmer and F.D.I. systems.
2. Principles Of Cavity Preparation :
   Steps and nomenclature of cavity preparation classification of cavities, nomenclature of floors angles of cavities.
3. Dental Caries :
   Aetiology, classification clinical features, morphological features, microscopic features, clinical diagnosis and sequel of dental caries.
4. Treatment Planning For Operative Dentistry:
   Detailed clinical examination , radiographic examination, tooth vitality tests, diagnosis and treatment planning, preparation of the case sheet.
5. Gnathological Concepts Of Restoration:
   Physiology of occlusion, normal occlusion, Ideal occlusion, mandibular movements and occlusal analysis. Occlusal rehabilitation and restoration.
6. Aramamentarium For Cavity Preparation:
   General classification of operative instruments, Hand cutting instruments design formula and sharpening of instruments. Rotary cutting instruments dental bur, mechanism of cutting, evaluation of hand piece and speed current concepts of rotary cutting procedures. Sterilisation and maintenance of instruments. Basic instrument tray set up.
7. Control of Operating Filed:
   Light source sterilisation field of operation control of moisture, rubber dam in detail, cotton rolls and anti sialogagues.
8. Amalgam Restoration :
   Indication contraindication, physical and mechanical properties , clinical behaviour. Cavity preparation for Class I , II, V and III. Step wise procedure for cavity preparation and restoration. Failure of amalgam restoration.
9. Pulp Protection :
   Liners, varnishes and bases, Zinc phosphate, zinc polycarboxylate, zinc oxide eugenol and glass inomer cements.
10. Anterior Restorations :
    Selection of cases, selection of material, step wise procedures for using restorations , silicate (theory only) glass inomers, composites, including sand witch restorations and bevels of the same with a note on status of the dentine bonding agents.
11. Direct Filling Gold Restorations :
    Types of direct filling gold indications and limitations of cohesive gold. Annealing of gold foil cavity preparation and condensation of gold foils.
12. Preventive Measures In Restorative Practice :
    Plaque Control, Pitand fissure sealants dietary measures restorative procedure and periodontal health. Contact and contour of teeth and restorations matrices tooth separation and wedges.
13. Temporisation or Interim Restoration.
14. Pin Amalgam Restoration Indication Contra Indication :
    Advantages disadvantages of each types of pin methods of placement use of auto matrix. Failure of pin amalgam restoration.
15. Management Of Deep Carious Lesions Indirect And Direct Pulp Capping.
16. Non Carious Destruction's Tooth Structures Diagnosis and Clinical Management
17. Hyper Sensitive Dentine And Its Management.
18. Cast Restorations
    Indications, contra indications, advantages and disadvantages and materials used for same Class II and Class I cavity preparation for inlays fabrication of wax pattern spurring inverting and casting procedures & casting defects.

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19. Die Materials And Preparation Of Dies.
20. Gingival Tissue Management For Cast Restoration And Impression Procedures
21. Recent Cavity Modification Amalgam Restoration.
22. Differences between Amalgam And Inlay Cavity preparation with note on all the types of Bewels used for Cast Restoration.
23. Control Of Pain During Operative Procedures.
24. Treatment Planning For Operative Dentistry Detailed Clinical Examination Radiographic Examination
25. Vitality Tests, Diagnosis And Treatment Planning And Preparation Of Case Sheet.
26. Applied Dental Materials.
    1. Biological Considerations.
       Evaluation, clinical application and adverse effects of the following materials. Dental cements, Zinc oxide euginol cements zinc phosphate cements, polycarboxylates glass ionomer cements, silicate cement calcium hydroxides varnishes.
    2. Dental amalgam, technical considerations mercury toxicity mercury hygiene.
    3. Composite, Dentine bonding agents, chemical and light curing composites
    4. Rubber base Imp. Materials
    5. Nobel metal alloys & non noble metal alloys
    6. Investment and die materials
    7. Inlay casting waxes
    8. Dental porcelain
    9. Aesthetic Dentistry
27. Endodontics: introduction definition scope and future of endodontics
28. Clinical diagnostic methods
29. Emergency endodontic procedures
30. Pulpal diseases causes, types and treatment .
31. Periapical diseases: acute periapical abscess, acute periodontal abscess phoeix abscess, chronic alveolar abscess granuloma cysts condensing osteits, external resorption.
32. Vital pulp therapy: indirect and direct pulp capping pulpotomy different types and medicaments used.
33. Apexogenisis and apexification or problems of open apex.
34. Rationale of endodontic treatment case selection indication and contraindications for root canal treatments.
35. Principles of root canal treatment mouth preparation root canal instruments, hand instruments, power driven instruments, standardisation color coding principle of using endodontic instruments. Sterilisation of root canal instruments and materials rubber dam application.
36. Anatomy of the pulp cavity: root canals apical foramen. Anomalies of pulp cavities access cavity preparation of anterior and premolar teeth.
37. Preparation of root canal space . Determination of working length, cleaning and shaping of root canals, irrigating solution chemical aids to instrumentation.
38. Disinfection of root canal space intracanal medicaments, poly antibiotic paste ross mans paste, mummifying agents. Out line of root canal treatment, bacteriological examinations, culture methods.
39. Problems during cleaning and shaping of root canal spaces. Perforation and its management. Broken instruments and its management, management of single and double curved root canals.
40. Methods of cleaning and shaping like step back crown down and conventional methods.
41. Obturation of the root canal system. Requirements of an ideal root canal filling material obturation methods using gutta percha healing after endodontic treatment. Failures in endodontics.
42. Root canal sealers. Ideal properties classification. Manipulation of root canal sealers.
43. post endodontic restoration fabrication and components of post core preparation.
44. smear layer and its importance in endodontics and conservative treatment.
45. discoloured teeth and its management. Bleaching agents, vital and non vital bleaching methods.
46. traumatised teeth classification of fractured teeth. Management of fractured tooth and root. Luxated teeth and its management.
47. endodontic surgeries indication contraindications, pre operative preparation. Pre medication surgical instruments and techniques apicectomy, retrograde filling, post operative sequale terphination hemisection, radiscetomy techniques of tooth reimplantation (both intentional and accidental) endodontic implants.
48. root resorption.
49. emergency endodontic procedures.
50. lasers in conservative endodontics (introduction only) practice management
51. professional association dentist act 1948 and its amendment 1993.
52. duties towards the govt. Like payments of professional tax, income tax.
53. financial management of practice
54. dental material and basic equipment management.
55. Ethics

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12. ORAL & MAXILLOFACIAL SURGERY

AIMS:

To produce a graduate who is competent in performing extraction of teeth under both local and general anaesthesia, prevent and manage related complications, acquire a reasonable knowledge and understanding of the various diseases, injuries, infections occurring in the Oral & Maxillofacial region and offer solutions to such of those common conditions and has an exposure in to the in-patient management of maxillofacial problems.

OBJECTIVES:

a) Knowledge & Understanding:

At the end of the course and the clinical training the graduate is expected to -

1. Able to apply the knowledge gained in the related medical subjects like pathology, microbiology and general medicine in the management of patients with oral surgical problem.
2. Able to diagnose, manage and treat (understand the principles of treatment of) patients with oral surgical problems.
3. Knowledge of range of surgical treatments.
4. Ability to decide the requirement of a patient to have oral surgical specialist opinion or treatment.
5. Understand the principles of in-patient management.
6. Understanding of the management of major oral surgical procedures and principles involved in patient management.
7. Should know ethical issues and communication ability.

b) Skills:

1. A graduate should have acquired the skill to examine any patient with an oral surgical problem in an orderly manner. Be able to understand requisition of various clinical and laboratory investigations and is capable of formulating differential diagnosis.
2. Should be competent in the extraction of teeth under both local and general anaesthesia.
3. Should be able to carry out certain minor oral surgical procedures under L.A. like frenectomy, alveolar procedures & biopsy etc.
4. Ability to assess, prevent and manage various complications during and after surgery.
5. Able to provide primary care and manage medical emergencies in the dental office.
6. Understanding of the management of major oral surgical problems and principles involved in inpatient management.

DETAILED SYLLABUS

1. Introduction, definition, scope, aims and objectives.
2. Diagnosis in oral surgery:
   (A) History taking
   (B) Clinical examination
   (C) Investigations.
3. Principles of infection control and cross-infection control with particular reference to HIV/AIDS and Hepatitis.
4. Principles of Oral Surgery -
   a) Asepsis: Definition, measures to prevent introduction of infection during surgery.
      1. Preparation of the patient
      2. Measures to be taken by operator
      3. Sterilisation of instruments - various methods of sterilisation etc.
      4. Surgery set up.
   b) Painless Surgery:
      1. Pre-anaesthetic considerations. Pre-medication: purpose, drugs used
      2. Anaesthetic considerations -
         a) Local b) Local with IV sedations
      3. Use of general anaesthetic
   c) Access:
      Intra-oral: Mucoperiosteal flaps, principles, commonly used intra oral incisions.
      Bone Removal: Methods of bone removal.
      Use of Burs: Advantages & precautions
      Bone cutting instruments: Principles of using chisel & osteotome.
      Extra-oral: Skin incisions - principles, various extra-oral incision to expose facial skeleton.
         a) Submandibular
         b) Pre auricular
         c) Incision to expose maxilla & orbit
         d) Bicoronal incision
   d) Control of haemorrhage during surgery
      Normal Haemostasis
      Local measures available to control bleeding
      Hypotensive anaesthesia etc.
   e) Drainage & Debridement
      Purpose of drainage in surgical wounds

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Types of drains used
Debridement: purpose, soft tissue & bone debridement.

f) Closure of wounds
Suturing: Principles, suture material, classification, body response to various materials etc.

g) Post operative care
Post operative instructions
Physiology of cold and heat
Control of pain - analgesics
Control of infection - antibiotics
Control of swelling - anti-inflammatory drugs
Long term post operative follow up - significance.

5. Exodontia: General considerations
Ideal Extraction.
Indications for extraction of teeth
Extractions in medically compromised patients.
Methods of extraction -
(a) Forceps or intra-alveolar or closed method.
Principles, types of movement, force etc.
(b) Trans-alveolar, surgical or open method, Indications, surgical procedure.
Dental elevators: uses, classification, principles in the use of elevators, commonly used elevators.
Complications of Exodontia -
Complications during exodontia
Common to both maxilla and mandible.
Post-operative complications -
Prevention and management of complications.

6. Impacted teeth:
Incidence, definition, aetiology.
(a) Impacted mandibular third molar.
Classification, reasons for removal,
Assessment - both clinical & radiological
Surgical procedures for removal.
Complications during and after removal,
Prevention and management.
(b) Maxillary third molar,
Indications for removal, classification,
Surgical procedure for removal.
(c) Impacted maxillary canine
Reasons for canine impaction,
Localization, indications for removal,
Methods of management, labial and palatal approach,
Surgical exposure, transplantation, removal etc.

7. Pre-prosthetic Surgery:
Definition, classification of procedures
(a) Corrective procedures: Alveoloplasty,
Reduction of maxillary tuberosities,
Frenoctemies and removal of tori.
(b) Ridge extension or Sulcus extension procedures
Indications and various surgical procedures
(c) Ridge augmentation and reconstruction.
Indications, use of bone grafts, Hydroxyapatite
Implants - concept of osseo integration
Knowledge of various types of implants and
surgical procedure to place implants.

8. Diseases of the maxillary sinus
Surgical anatomy of the sinus.
Sinusitis both acute and chronic
Surgical approach of sinus - Caldwell-Luc procedure
Removal of root from the sinus.
Oro-antral fistula - aetiology, clinical features and various surgical methods for closure.

9. Disorders of T.M. Joint
Applied surgical anatomy of the joint.
Dislocation - Types, aetiology, clinical features and management.
Ankylosis - Definition, aetiology, clinical features and management
Myo-facial pain dysfunction syndrome, aetiology, clinical features, management- Non surgical and surgical.

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Internal derangement of the joint.
Arthritis of T.M. Joint.

10. Infections of the Oral cavity
    Introduction, factors responsible for infection, course of odontogenic infections, spread of odontogenic infections through various facial spaces.
    Dento-alveolar abscess - aetiology, clinical features and management.
    Osteomyelitis of the jaws - definition, aetiology, pre-disposing factors, classification, clinical features and management.
    Ludwigs angina - definition, aetiology, clinical features, management and complications.
11. Benign cystic lesions of the jaws -
    Definition, classification, pathogenesis.
    Diagnosis - Clinical features, radiological, aspiration biopsy, use of contrast media and histopathology.
    Management - Types of surgical procedures, Rationale of the techniques, indications, procedures, complications etc.
12. Tumours of the Oral cavity -
    General considerations
    Non odontogenetic benign tumours occuring in oral cavity - fibroma, papilloma, lipoma, ossifying fibroma, mynoma etc.
    Ameloblastoma - Clinical features, radiological appearance and methods of management.
    Carcinoma of the oral cavity -
    Biopsy - types
    TNM classification.
    Outline of management of squamous
    Cell carcinoma: surgery, radiation and chemotherapy
    Role of dental surgeons in the prevention and early detection of oral cancer.
13. Fractures of the jaws -
    General considerations, types of fractures, aetiology, clinical features and general principles of management.
    mandibular fractures - Applied anatomy, classification.
    Diagnosis - Clinical and radiological
    Management - Reduction closed and open
    Fixation and immobilisation methods
    Outline of rigid and semi-rigid internal fixation.
    Fractures of the condyle - aetiology, classification, clinical features, principles of management.
    Fractures of the middle third of the face.
    Definition of the mid face, applied surgical anatomy, classification, clinical features and outline of management.
    Alveolar fractures - methods of management
    Fractures of the Zygomatic complex
    Classification, clinical features, indications for treatment, various methods of reduction and fixation.
    Complications of fractures - delayed union, non-union and malunion.
14. Salivary gland diseases -
    Diagnosis of salivary gland diseases'
    Sialography, contrast media, procedure.
    Infections of the salivary glands
    Sialolithiasis - Sub mandibular duct and gland and parotid duct.
    Clinical features, management.
    Salivary fistulae
    Common tumours of salivary glands like Pleomorphic adenoma including minor salivary glands.
15. Jaw deformities -
    Basic forms - Prognathism, Retrognathism and open bite.
    Reasons for correction.
    Outline of surgical methods carried out on mandible and maxilla.
16. Neurological disorders -
    Trigeminal neuralgia - definition, aetiology, clinical features and methods of management including surgical.
    Facial paralysis - Aetiology, clinical features.
    Nerve injuries - Classification, neurorhaphy etc.
17. Cleft Lip and Palate -
    Aetiology of the clefts, incidence, classification, role of dental surgeon in the management of cleft patients. Outline of the closure procedures.

18. Medical Emergencies in dental practice –

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Primary care of medical emergencies in dental practice particularly -
(a)Cardio vascular (b) Respiratory(c) Endocrine
(d)Anaphylactic reaction (e) Epilepsy (f) Epilepsy

19. Emergency drugs & Intra muscular I.V. Injections -
Applied anatomy, Ideal location for giving these injections, techniques etc.
20. Oral Implantology
21. Ethics

LOCAL ANAESTHESIA:

Introduction, concept of L.A., classification of local anaesthetic agents, ideal requirements, mode of action, types of local anaesthesia, complications.

Use of Vaso constrictors in local anaesthetic solution -
Advantages, contra-indications, various vaso constrictors used.
Anaesthesia of the mandible -
Pterygomandibular space - boundaries, contents etc.
Interior Dental Nerve Block - various techniques
Complications
Mental foramen nerve block
Anaesthesia of Maxilla -
Intra - orbital nerve block.
Posterior superior alveolar nerve block
Maxillary nerve block - techniques.

GENERAL ANAESTHESIA –

Concept of general anaesthesia.
Indications of general anaesthesia in dentistry.
Pre-anaesthetic evaluation of the patient.
Pre-anaesthetic medication - advantages, drugs used.
Commonly used anaesthetic agents.
Complication during and after G.A.
I.V. sedation with Diazepam and Medozolam.
Indications, mode of action, technique etc.
Cardiopulmonary resuscitation
Use of oxygen and emergency drugs.
Tracheostomy.

RECOMMENDED BOOKS:

1. Impacted teeth; Alling John F & etal.
2. Principles of oral and maxillofacial surgery; Vol.1,2 & 3 Peterson LJ & etal.
3. Text book of oral and maxillofacial surgery; Srinivasan B.
4. Handbook of medical emergencies in the dental office, Malamed SF.
5. Killeys Fractures of the mandible; Banks P.
6. Killeys fractures of the middle 3rd of the facial skeleton; Banks P.
7. The maxillary sinus and its dental implications; McGovanda
8. Killey and Kays outline of oral surgery – Part-1; Seward GR & etal
9. Essentials of safe dentistry for the medically compromised patients; Mc Carthy FM
10. Oral & maxillofacial surgery, Vol 2; Laskin DM
11. Extraction of teeth;Howe, GL
12. Minor Oral Surgery; Howe.GL
13. Contemporary oral and maxillofacial surgery; Peterson I.J.& EA
14. Oral and maxillofacial infections; Topazian RG & Goldberg MH

13. ORAL MEDICINE AND RADIOLOGY

AIMS:

(1) To train the students to diagnose the common disorders of Orofacial region by clinical examination and with the help of such investigations as may be required and medical management of oro-facial disorders with drugs and physical agents.
(2) To train the students about the importance, role, use and techniques of radiographs/digital radiograph and other imaging methods in diagnosis.
(3) The principles of the clinical and radiographic aspects of Forensic Odontology.
The syllabus in ORAL MEDICINE & RADIOLOGY is divided into two main parts.
(I) Diagnosis, Diagnostic methods and Oral Medicine (II) Oral Radiology. Again the part ONE is subdivided into three sections. (A) Diagnostic methods (B) Diagnosis and differential diagnosis (C) Oral Medicine & Therapeutics.

COURSE CONTENT

(1) Emphasis should be laid on oral manifestations of systemic diseases and ill-effects of oral sepsis on general health.
(2) To avoid confusion regarding which lesion and to what extent the student should learn and know, this elaborate syllabus is prepared. As certain lesions come under more than one group, there is repetition.

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Part-I ORAL MEDICINE AND DIAGNOSTIC AIDS

SECTION (A) – DIAGNOSTIC METHODS.

(1) Definition and importance of Diagnosis and various types of diagnosis
(2) Method of clinical examinations.
(a) General Physical examination by inspection.
(b) Oro-facial region by inspection, palpation and other means
(c) To train the students about the importance, role, use of saliva and techniques of diagnosis of saliva as part of oral disease
(d) Examination of lesions like swellings, ulcers, erosions, sinus, fistula, growths, pigmented lesions, white and red patches
(e) Examination of lymph nodes
(f) Forensic examination – Procedures for post-mortem dental examination; maintaining dental records and their use in dental practice and post-mortem identification; jurisprudence and ethics.
(3) Investigations
(a) Biopsy and exfoliative cytology
(b) Hematological, Microbiological and other tests and investigations necessary for diagnosis and prognosis

SECTION (B) – DIAGNOSIS, DIFFERENTIAL DIAGNOSIS

While learning the following chapters, emphasis shall be given only on diagnostic aspects including differential diagnosis

(1) Teeth: Developmental abnormalities, causes of destruction of teeth and their sequelae and discoloration of teeth
(2) Diseases of bone and Osteodystrophies: Development disorders: Anomalies, Exostosis and tori, infantile cortical hyperostosis, osteogenisis imperfecta, Marfans syndrome, osteopetrosis. Inflamation – Injury, infection and sperad of infection,fascial space infections, osteoradionecrosis. Metabolic disorders – Histiocytosis
Endocrine – Acro-megaly and hyperparathyroidism
Miscellaneous – Paget's disease, Mono and polyostotic fibrous dysplasia, Cherubism.
(3) Temparomandibular joint: Developmental abnormalities of the condyle. Rheumatoid arthritis, Osteoarthritis, Sub-luxation and luxation.
(4) Common cysts and Tumors:
CYSTS: Cysts of soft tissue: Mucocele and Ranula
Cysts of bone: Odontogenic and nonodontogenic.

TUMORS:
Soft Tissue:
Epithelial: Papilloma, Carcinoma, Melanoma
Connective tissue: Fibroma, Lipoma, Fibrosarcoma
Vascular: Haemangioma, Lymphangioma
Nerve Tissue: Neurofibroma, Traumatic Neuroma, Neurofibromatosis
Salivary Glands: Pleomorphic adenoma, Adenocarcinoma, Warthin's Tumor, Adenoid cystic carcinoma.
Hard Tissue:
Non Odontogenic: Osteoma, Osteosarcoma, Osteoclastoma, Chondroma, Chandrosarcoma, Central giant cell rumor, and Central haemangioma
Odontogenic: Enameloma, Ameloblastoma, Calcifying Epithelial Odontogenic tumor, Adenomatoid Odontogenic tumor, Periapical cemental dysphasia and odontomas

(5) Periodontal diseases: Gingival hyperplasia, gingivitis, periodontitis, pyogenic granuloma
(6) Granulomatous diseases: Tuberculosis, Sarcoidosis, Midline lethal granuloma, Crohn's Disease and Histiocytosis X
(7) Miscellaneous Disorders: Burkitt lymphoma, sturge – Weber syndrome, CREST syndrome, rendu-osler-weber disease

SECTION (C): ORAL MEDICINE AND THERAPEUTICS.

The following chapters shall be studied in detail including the eiology, pathogenesis, clinical features, investigations, differential diagnosis, management and prevention

(1) Infections of oral and paraoral structures:
Bacterial: Streptococcal, tuberculosis, syphillis, vincents, leprosy, actinomycosis, diphtheria and tetanus
Fungal: Candida albicans
Virus: Herpes simplex, herpes zoster, ramsay hunt syndrome, measles, herpangina, mumps, infectious mononucleosis, AIDS and hepatitis-B
(2) Important common mucosal lesions:
White lesions: Chemical burns, leukodema, leukoplakia, fordyce spots, stomatitis nicotina palatinus, white sponge nevus, candidiasis, lichenplanus, discoid lupus erythematosis
Veiculo-bullous lesions: Herpes simplex, herpes zoster, herpangina, bullous lichen planus, pemphigus, cicatricial pemphigoid erythema multiforme.
Ulcers: Acute and chronic ulcers
Pigmented lesions: Exogenous and endogenous

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Red lesions: Erythroplakia, stomatitis venenata and medicamentosa, erosive lesions and denture sore mouth.

(3) Cervico-facial lymphadenopathy

(4) Facial pain:

(i)Organic pain: Pain arising from the diseases of orofacial tissues like teeth, pulp, gingival, periodontal tissue, mucosa, tongue, muscles, blood vessels, lymph tissue, bone, paranasal sinus, salivary glands etc.,

(ii) Pain arising due to C.N.S. diseases:

(a) Pain due to intracranial and extracranial involvement of cranial nerves. (Multiple sclerosis, cerebrovascular diseases, trotter's syndrome etc.)

(b) Neuralgic pain due to unknown causes: Trigeminal neuralgia, glossopharyngeal neuralgia, sphenopalatine ganglion neuralgia, periodic migrainous neuralgia and atypical facial pain

(iii) Referred pain: Pain arising from distant tissues like heart, spine etc.,

(5) Altered sensations: Cacogeusia, halitosis

(6) Tongue in local and systemic disorders: (Aglossia, ankyloglossia, bifid tongue, fissured tongue, scrotal tongue, macroglossia, microglossia, geographic tongue, median rhomboid glossitis, depapillation of tongue, hairy tongue, atrophic tongue, reactive lymphoid hyperplasia, glossodynia, glossopyrosis, ulcers, white and red patches etc.)

(7) Oral manifestations of:

(i) Metabolic disordeers:

(a) Porphyria

(b) Haemochromatosis

(c) Histocytosis X diseases

(ii) Endocrine disorders:

(a) Pituitary: Gigantism, acromegaly, hypopitutarism

(b) Adrenal cortex: Addison's disease (Hypofuntion)
Cushing's syndrome (Hyperfunction)

(c) Parathyroid glands: Hyperparathyroidism.

(d) Thyroid gland: (Hypothyroidism) Cretinism, myxedema

(e) Pancreas: Diabetes

(iii) Nutritional deficiency: Vitamins: riboflavin, nicotinic acid, folic acid Vitamin B12, Vitamin C (Scurvy)

(iv) Blood disorders:

(a) Red blood cell diseases
Defficiency anemias: (Iron deficiency, plummer – vinson syndrome, pernicious anemia)
Haemolytic anemias: (Thalassemia, sickle cell anemia, erythroblastosis fetalis)
Aplastic anemia
Polycythemia

(b) White Blood cell diseases
Neutropenia, cyclic neutropenia, agranulocytosis, infectious mononeucleosis and leukemias

(c) Haemorrhagic disorders:
Thrombocytopenia, purpura, hemophillia, chrismas disease and von willebrand's disease

(8) Disease of salivary glands:

(i)Development distrubances: Aplasia, atresia and aberration

(ii) Functional disturbances:Xerostomia, ptyalism

(iii) Inflammatory conditions: Nonspecific sialadenitis, mumps, sarcoidosis heerdfort's syndrome (Uveoparotid fever), Necrotising sialometaplasia

(iv) Cysts and tumors: Mucocele, ranula, pleomorphic adenoma, mucoepidermoid carcinoma

(v) Miscellaneous: Sialolithiasis, sjogren's syndrome, mikuliez's disease and sialosis

(9) Dermatological diseases with oral manifestations:

(a) Ectodermal dysplasia (b) Hyperkerotosis palmarplantaris with periodont0opathy (c) Scleroderma (d) Lichen planus including ginspan's syndrome (e) Luplus erythematosus (f) Pemphigus (g) Erythema multiforme (h) Psoriasis

(10)Immunological diseases with oral manifestations

(a) Leukemia (b) Lymphomas (c) Multiple mycloma (d) AIDS clinical manifestations, opportunistic infections, neoplasms (e) Thrombcytopenia (f) Lupus erythematosus (g) Scleroderma (h) dermatomyositis (I) Submucous fibrosis (j) Rhemtoid arthritis (k) Recurrent oral ulcerations including behcet's syndrome and reiter's syndrome

(11)Allergy: Local allergic reactions, anaphylaxis, serum sickness (local and systemic allergic manifestations to food drugs and chemicals)

(12)Foci of oral infection and their ill effects on general health

(13)Management of dental problems in medically comrpomised persons:

(i)Physiological changes: Puberty, pregnancy and menopause

(ii) The patients suffering with cardiac, respiratory, liver, kidney and bleeding disorders, hypertension, diabetes and AIDS. Post-irradiated patients.

(14)Precancerous lesions and conditions

(15)Nerve and muscle diseases:

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(i)Nerves: (a) Neuropraxia (b) Neurotemesis (c) Neuritis (d) Facial nerve paralysis including Bell's palsy, Heerfordt's syndrome, Melkerson Rosenthel syndrome and ramsay hunt syndrome (e) Neuroma (f) Neurofibromatosis (g) Frey'syndrome

(ii) Muscles: (a) Myositis ossificans (b) Myofascial pain dysfunction syndrome (c) Trismus

(16)Forensic odontology:

(a) Medicolegal aspects of orofacial injuries
(b) Identification of bite marks
(c) Determination of age and sex
(d) Identification of cadavers by dental appliances, Restorations and tissue remanants

(17)Therapeutics: General therapeutic measures – drugs commonly used in oral medicine viz., antibiotics, chemotherapeutic agents, anti-inflammatory and analgesic drugs, astringents, mouth washes, styptics, demelucents, local surface anaesthetic, sialogogues, antisialogogues and drugs used in the treatment of malignancy

Part – II BEHAVIOURAL SCIENCES AND ETHICS.
Part – III ORAL RADIOLOGY

(1) Scope of the subject and history of origin
(2) Physics of radiation: (a) Nature and types of radiations (b) Source of radiations (c) Production of X-rays (d) Properties of X-rays (e) Compton effect (f) Photoelectric effect (g) Radiation measuring units
(3) Biological effects of radiation
(4) Radiation safety and protection measures
(5) Principles of image production
(6) Radiographic techniques:
(i)Intra-Oral: (a) Periapical radiographs (Bisecting and parallel technics) (b) Bite wing radiographs (c) Occlusal radiographs
(ii) Extra-oral: (a) Lateral projections of skull and jaw bones and paranasal sinuses (c) Cephalograms (d) Orthopantomograph (e) Projections of temperomandibular joint and condyle of mandible (f) Projections for Zygomatic arches
(iii) Specialised techniques: (a) Sialography (b) Xeroradiography (c) Tomography
(7) Factors in production of good radiographs:
(a) K.V.P. and mA.of X-ray machine (b) Filters (c) Collimations (d) Intensifying screens (e) Grids (f) X-ray films (g) Exposure time (h) Techniques (i) Dark room (j) Developer and fixer solutions (k) Film processing
(8) Radiographic normal anatomical landmarks
(9) Faculty radiographs and artefacts in radiographs
(10) Interpretation of radiographs in various abnormalities of teeth, bones and other orofacial tissues
(11) Principles of radiotherapy of oro-facial malignancies and complications of radiotherapy
(12) Cantrast radiography and basic knowledge of radio-active isotopes
(13)Radiography in Forensic Odontoloy - Radiographic age estimation and post-mortem radiographic methods

PRACTICALS / CLINICALS:

1. Student is trained to arrive at proper diagnosis by following a scientific and systematic proceedure of history taking and examination of the orofacial region. Training is also imparted in management wherever possible. Training also shall be imparted on saliva diagnostic procedures. Training also shall be imparted in various radiographic proceedures and interpretation of radiographs.
2. In view of the above each student shall maintain a record of work done, which shall be evaluated for marks at the time of university examination
3. The following is the minimum of prescribed work for recording
   (a) Recording of detailed case histories of interesting cases 10
   (b) Intra-oral radiographs (Periapical, bitewing, occlusal) 25
   (c) Saliva diagnostic check as routine procedure

BOOKS RECOMMENDED:

a) Oral Diagnosis, Oral Medicine & Oral Pathology
1. Burkit – Oral Medicine – J.B. Lippincott Company
2. Coleman – Principles of Oral Diagnosis – Mosby Year Book
3. Jones – Oral Manifestations of Systemic Diseases – W.B. Saunders company
4. Mitchell – Oral Diagnosis & Oral Medicine
5. Kerr – Oral Diagnosis
6. Miller – Oral Diagnosis & Treatment
7. Hutchinson – clinical Methods
8. Oral Pathology – Shafers
9. Sonis.S.T., Fazio.R.C. and Fang.L - Principles and practice of Oral Medicine

b) Oral Radiology
1. White & Goaz – Oral Radiology – Mosby year Book
2. Weahrman – Dental Radiology – C.V. Mosby Company
3. Stafne – Oral Roentgenographic Diagnosis – W.B.Saunders Co.,

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21. Retention And Relapse

Definition, Need for retention, Causes of relapse, Methods of retention, Different types of retention devices, Duration of retention, Theories of retention.

CLINICALS AND PRACTICALS IN ORTHODONTICS

PRACTICAL TRAINING DURING II YEAR B.D.S.

I. Basic wire bending exercises Gauge 22 or 0.7mm
   1. Straightening of wires (4 Nos.)
   2. Bending of a equilateral triangle
   3. Bending of a rectangle
   4. Bending of a square
   5. Bending of a circle
   6. Bending of U.V.

II. Construction of Clasps (Both sides upper/lower) Gauge 22 or 0.7mm
   1. 3/4 Clasp (C-Clasp)
   2. Full Clasp (Jackson's Crib)
   3. Adam's Clasp
   4. Triangular Clasp

III. Construction of Springs (on upper both sides) Gauge 24 or 0.5mm
   1. Finger Spring
   2. Single Cantelever Spring
   3. Double Cantelever Spring (Z-Spring)
   4. T-Springs on premolars

IV. Construction of Canine retractors Gauge 23 or 0.6mm
   1. U - Loop canine retractor
      (Both sides on upper & lower)
   2. Helical canine retractor
      (Both sides on upper & lower)
   3. Buccal canine retractor:
      - Self supported buccal canine retractor with
        a) Sleeve - 5mm wire or 24 gauge
        b) Sleeve - 19 gauge needle on any one side.
   4. Palatal canine retractor on upper both sides
      Gauge 23 or 0.6mm

V. Labial Bow
   Gauge 22 or 0.7mm
   One on both upper and lower

CLINICAL TRAINING DURING III YEAR B.D.S.

NO.	EXERCISE
01.	Making upper Alginate impression
02.	Making lower Alginate impression
03.	Study Model preparation
04.	Model Analysis

a. Pont's Analysis
b. Ashley Howe's Analysis
c. Carey's Analysis
d. Bolton's Analysis
e. Moyer's Mixed Dentition Analysis

CLINICAL TRAINING DURING FINAL YEAR B.D.S.

NO.	EXERCISE
01.	Case History taking
02.	Case discussion
03.	Discussion on the given topic
04.	Cephalometric tracings

a. Down's Analysis
b. Steiner's Analysis
c. Tweed's Analysis

PRACTICAL TRAINING DURING FINAL YEAR B.D.S.

1. Adam's Clasp on Anterior teeth Gauge 0.7mm
2. Modified Adam's Clasp on upper arch Gauge 0.7mm
3. High Labial bow with Apron spring on upper arch
   (Gauge of Labial bow - 0.9mm, Apron spring - 0.3mm)
4. Coffin spring on upper arch Gauge 1mm

Appliance Construction in Acrylic

1. Upper & Lower Hawley's Appliance
2. Upper Hawley's with Anterior bite plane
3. Upper Habit breaking Appliance

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4. Upper Hawley's with Posterior bite plane with `Z' Spring
5. Construction of Activator
6. Lower inclined plane/Catalan's Appliance
7. Upper Expansion plate with Expansion Screw

RECOMMENDED AND REFERENCE BOOKS

1. CONTEMPORARY ORTHODONTICS — WILLIAM R. PROFFIT
2. ORTHODONTICS FOR DENTAL STUDENTS — WHITE and GARDINER
3. HANDBOOK OF ORTHODONTICS — MOYERS
4. ORTHODONTICS - PRINCIPLES AND PRACTICE — GRABER
5. DESIGN, CONSTRUCTION AND USE OF REMOVABLE ORTHODONTIC APPLIANCES — C. PHILIP ADAMS
6. CLINICAL ORTHODONTICS: VOL1 & 2 — SALZMANN

15. PAEDIATRIC & PREVENTIVE DENTISTRY

THEORY:

1. INTRODUCTION TO PEDODONTICS & PREVENTIVE DENTISTRY.
   - Definition, Scope, Objectives and Importance.
2. GROWTH & DEVELOPMENT:
   - Importance of study of growth and development in Pedodontics.
   - Prenatal and Postnatal factors in growth & development.
   - Theories of growth & development.
   - Development of maxilla and mandible and related age changes.
3. DEVELOPMENT OF OCCLUSION FROM BIRTH THROUGH ADOLESCENCE.
   - Study of variations and abnormalities.
4. DENTAL ANATOMY AND HISTOLOGY:
   - Development of teeth and associated structures.
   - Eruption and shedding of teeth.
   - Teething disorders and their management.
   - Chronology of eruption of teeth.
   - Differences between deciduous and permanent teeth.
   - Development of dentition from birth to adolescence.
   - Importance of first permanent molar.
5. DENTAL RADIOLOGY RELATED TO PEDODONTICS.
6. ORAL SURGICAL PROCEDURES IN CHILDREN.
   - Indications and contraindications of extractions of primary and permanent teeth in children.
   - Knowledge of Local and General Anesthesia.
   - Minor surgical procedures in children.
7. DENTAL CARIES:
   - Historical background.
   - Definition, aetiology & pathogenesis.
   - Caries pattern in primary, young permanent and permanent teeth in children.
   - Rampant caries, early childhood caries and extensive caries:
     * Definition, aetiology, Pathogenesis, Clinical features, Complications & Management
   - Role of diet and nutrition in Dental Caries.
   - Dietary modifications & Diet counseling.
   - Caries activity, tests, caries prediction, caries susceptibility & their clinical application.
8. GINGIVAL & PERIODONTAL DISEASES IN CHILDREN.
   - Normal gingiva & periodontium in children.
   - Definition, aetiology & Pathogenesis.
   - Prevention & Management of gingival & Periodontal diseases.
9. CHILD PSYCHOLOGY:
   - Definition.
   - Theories of child psychology.
   - Psychological development of children with age.
   - Principles of psychological growth & development while managing child patient.
   - Dental fear and its management.
   - Factors affecting child's reaction to dental treatment.
10. BEHAVIOUR MANAGEMENT:
   - Definitions.
   - Types of behaviour encountered in the dental clinic.
   - Non-pharmacological & pharmacological methods of Behaviour Management.
11. PEDIATRIC OPERATIVE DENTISTRY:
   - Principles of Pediatric Operative Dentistry.
   - Modifications required for cavity preparation in primary and young permanent teeth.
   - Various Isolation Techniques.
   - Restorations of decayed primary, young permanent and permanent teeth in children using various restorative materials like Glass Ionomer, Composites & Silver Amalgam. Stainless steel, Polycarbonate & Resin Crowns.

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12. PEDIATRIC ENDODONTICS
    - Principles & Diagnosis.
    - Classification of Pulpal Pathology in primary, young permanent & permanent teeth.
    - Management of Pulpally involved primary, young permanent & permanent teeth.
        - Pulp capping – direct & indirect.
        - Pulpotomy
        - Pulpectomy
        - Apexogenesis
        - Apexification
    - Obturation Techniques & material used for primary, young permanent & Permanent teeth in children.
13. TRAUMATIC INJURIES IN CHILDREN:
    - Classifications & Importance.
    - Sequelae & reaction of teeth to trauma.
    - Management of Traumatized teeth.
14. PREVENTIVE & INTERCEPTIVE ORTHODONTICS:
    - Definitions.
    - Problems encountered during primary and mixed dentition phases & their management.
    - Serial extractions.
    - Space management.
15. ORAL HABITS IN CHILDREN:
    - Definition, Aetiology & Classification.
    - Clinical features of digit sucking, tongue thrusting, mouth breathing & various other secondary habits.
    - Management of oral habits in children.
16. DENTAL CARE OF CHILDREN WITH SPECIAL NEEDS:
    - Definition, Aetiology, Classification, Behavioural and Clinical features & Management of children with:
        - Physically handicapping conditions.
        - Mentally compromising conditions.
        - Medically compromising conditions.
        - Genetic disorders.
17. CONGENITAL ABNORMALITIES IN CHILDREN:
    - Definition, Classification, Clinical features & Management.
18. DENTAL EMERGENCIES IN CHILDREN & THEIR MANAGEMENT.
19. DENTAL MATERIALS USED IN PEDIATRIC DENTISTRY.
20. PREVENTIVE DENTISTRY:
    - Definition.
    - Principles & Scope.
    - Types of prevention.
    - Different preventive measures used in Pediatric Dentistry including pit and fissure sealants and caries vaccine.
21. DENTAL HEALTH EDUCATION & SCHOOL DENTAL HEALTH PROGRAMMES.
22. FLUORIDES:
    - Historical background.
    - Systemic & Topical fluorides.
    - Mechanism of action.
    - Toxicity & Management.
    - Defluoridation techniques.
23. CASE HISTORY RECORDING:
    - Outline of principles of examination, diagnosis & treatment planning.
24. SETTING UP OF PEDODONTIC CLINIC.
25. ETHICS.

B. PRACTICALS:

Following is the recommended clinical quota for under-graduate students in the subject of pediatric & preventive dentistry.

1. Restorations – Class I & II only : 45
2. Preventive measures e.g. Oral Prophylaxis – 20.
3. Fluoride applications – 10
4. Extractions – 25
5. Case History Recording & Treatment Planning – 10
6. Education & motivation of the patients using disclosing agents. Educating patients about oral hygiene measures like tooth brushing, flossing etc.

BOOKS RECOMMENDED & REFERENCE:

1. Pediatric Dentistry (Infancy through Adolescences) – Pinkham.
2. Kennedy's Pediatric Operative Dentistry – Kennedy & Curzon.
3. Occlusal guidance in Pediatric Dentistry – Stephen H. Wei.
4. Clinical Use of Fluorides – Stephen H. Wei.

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5. Pediatric Oral & Maxillofacial Surgery – Kaban.
6. Pediatric Medical Emergencies – P. S. whatt.
7. Understanding of Dental Caries – Niki Foruk.
8. An Atlas of Glass Ionomer cements – G. J. Mount.
9. Clinical Pedodontics – Finn.
10. Textbook of Pediatric Dentistry – Braham Morris.
11. Primary Preventive Dentistry – Norman O. Harris.
12. Handbook of Clinical Pedodontics – Kenneth. D.
13. Preventive Dentistry – Forrester.
14. The Metabolism and Toxicity of Fluoride – Garry M. whitford.
15. Dentistry for the Child and Adolescence – Mc. Donald.
16. Pediatric Dentistry – Damle S. G.
17. Behaviour Management – Wright
18. Pediatric Dentistry – Mathewson.
19. Traumatic Injuries – andreason.
20. Occlusal guidance in Pediatric Dentistry – Nakata.
21. Pediatric Drug Therapy – Tomare
22. Contemporary Orhtodontics – Profitt..
23. Preventive Dentistry – Depaola.
24. Metabolism & Toxicity of Fluoride – whitford. G. M.
25. Endodontic Practice – Grossman.
26. Principles of Endodontics – Munford.
27. Endodontics – Ingle.
28. Pathways of Pulp – Cohen.
29. Management of Traumatized anterior Teeth – Hargreaves.

16. PUBLIC HEALTH DENTISTRY

GOAL:

To prevent and control oral diseases and promote oral health through organized community efforts

OBJECTIVES:

Knowledge:

At the conclusion of the course the student shall have a knowledge of the basis of public health, preventive dentistry, public health problems in India, Nutrition, Environment and their role in health, basics of dental statistics, epidemiological methods, National oral health policy with emphasis on oral health policy.

Skill and Attitude:

At the conclusion of the course the students shall have require at the skill of identifying health problems affecting the society, conducting health surveys, conducting health education classes and deciding health strategies. Students should develop a positive attitude towards the problems of the society and must take responsibilities in providing health.

Communication abilities:

At the conclusions of the course the student should be able to communicate the needs of the community efficiently, inform the society of all the recent methodologies in preventing oral disease

Syllabus:

1. Introduction to Dentistry: Definition of Dentistry, History of dentistry, Scope, aims and objectives of Dentistry.
2. Public Health:
   - i. Health & Disease: - Concepts, Philosophy, Definition and Characteristics
   - ii. Public Health: - Definition & Concepts, History of public health
   - iii. General Epidemiology: - Definition, objectives, methods
   - iv. Environmental Health: - Concepts, principles, protection, sources, purification environmental sanitation of water disposal of waste sanitation, then role in mass disorder
   - v. Health Education: - Definition, concepts, principles, methods, and health education aids
   - vi. Public Health Administration: - Priority, establishment, manpower, private practice management, hospital management.
   - vii. Ethics and Jurisprudence: Professional liabilities, negligence, malpractice, consents, evidence, contracts, and methods of identification in forensic dentistry.
   - viii. Nutrition in oral diseases
   - ix. Behavioral science: Definition of sociology, anthropology and psychology and their in dental practice and community.
   - x. Health care delivery system: Center and state, oral health policy, primary health care, national programmes, health organizations.

Dental Public Health:

1. Definition and difference between community and clinical health.
2. Epidemiology of dental diseases-dental caries, periodontal diseases, malocclusion, dental fluorosis and oral cancer.
3. Survey procedures: Planning, implementation and evaluation, WHO oral health survey methods 1997, indices for dental diseases.

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4. Delivery of dental care: Dental auxiliaries, operational and non-operational, incremental and comprehensive health care, school dental health.
5. Payments of dental care: Methods of payments and dental insurance, government plans
6. Preventive Dentistry- definition, Levels, role of individual , community and profession, fluorides in dentistry, plaque control programmes.

Research Methodology and Dental Statistics

1. Health Information: - Basic knowledge of Computers, MS Office, Window 2000, Statistical Programmes
2. Research Methodology: -Definition, types of research, designing a written protocol
3. Bio-Statistics: - Introduction, collection of data, presentation of data, Measures of Central tendency, measures of dispersion, Tests of significance, Sampling and sampling techniques-types, errors, bias, blind trails and calibration.

Practice Management

1. Place and locality
2. Premises & layout
3. Selection of equipments
4. Maintenance of records/accounts/audit.

Dentist Act 1948 with amendment.
Dental Council of India and State Dental Councils
Composition and responsibilities.
Indian Dental Association
Head Office, State, local and branches.

PRACTICALS/CLINICALS/FIELD PROGEAMME IN COMMUNITY DENTISTRY:
These exercises designed to help the student in IV year students:

1. Understand the community aspects of dentistry
2. To take up leadership role in solving community oral health programme

Exercises:

a) Collection of statistical data (demographic) on population in India, birth rates, morbidity and mortality, literacy, per capita income
b) Incidence and prevalence of common oral diseases like dental caries, periodontal disease, oral cancer, fluorosis at national and international levels
c) Preparation of oral health education material posters, models, slides, lectures, play acting skits etc.
d) Oral health status assessment of the community using indices and WHO basic oral health survey methods
e) Exploring and planning setting of private dental clinics in rural, semi urban and urban locations, availment of finances for dental practices-preparing project report.
f) Visit to primary health center-to acquaint with activities and primary health care delivery
g) Visit to water purification plant/public health laboratory/ center for treatment of western and sewage water
h) Visit to schools-to assess the oral health status of school children, emergency treatment and health education including possible preventive care at school (tooth brushing technique demonstration and oral rinse programme etc.)
i) Visit to institution for the care of handicapped, physically, mentally, or medically compromised patients
j) Preventive dentistry: in the department application of pit and fissure sealants, fluoride gel application procedure, A. R. T., Comprehensive health for 5 pts at least 2 patients

The colleges are encouraged to involve in the N.S.S. programme for college students for carrying out social work in rural areas

SUGGESTED INTERNSHIP PROGRAMME IN COMMUNITY DENTISTRY:

I. AT THE COLLEGE:

Students are posted to the department to get training in dental practice management.

(a) Total oral health care approach- in order to prepare the new graduates in their approach to diagnosis, treatment planning, cost of treatment, prevention of treatment on schedule, recall maintenance of records etc. at least 10 patients (both children and adults of all types posting for at least one month).
(b) The practice of chair side preventive dentistry including oral health education

II. AT THE COMMUNITY ORAL HEALTH CARE CENTRE (ADOPTED BY THE DENTAL COLLEGE IN RURAL AREAS)

Graduates posted for at least on month to familiarize in:

(a) Survey methods, analysis and presentation of oral health assessment of school children and community independently using WHO basic oral health survey methods.
(b) Participation in rural oral health education programmes
(c) Stay in the village to understand the problems and life in rural areas

III. DESIRABLE: Learning use of computers-at least basic programme.

Examination Pattern

I. Index: Case History

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b) Oral hygiene indices simplified- Green and Vermilion
c) Silness and Loe index for Plaque
d) Loe and Silness index for gingival
e) CPI
f) DMF: T and S, df:t and s
g) Deans fluoride index

II. Health Education
1. Make one - Audio visual aid
2. Make a health talk

III. Practical work
1. Pit and fissure sealant
2. Topical fluoride application

BOOKS RECOMMENDED & REFERENCE:

1. Dentistry Dental Practice and Community by David F. Striffler and Brain A. Burt, Edn. –1983, W. B. Saunders Company
2. Principles of Dental Public Health by James Morse Dunning, IVth Edition, 1986, Harward University Press.
3. Dental Public Health and Community Dentistry Ed by Anthony Jong Publication by The C. V. Mosby Company 1981
4. Community Oral Health-A system approach by Patricia P. Cormier and Joyce I. Levy published by Appleton-Century-Crofts/New York, 1981
5. Community Dentistry-A problem oriented approach by P. C. Dental Hand book series Vol.8 by Stephen L. Silverman and Ames F. Tryon, Series editor-Alvin F. Gardner, PSG Publishing company Inc. Littleton Massachuseltts, 1980.
6. Dental Public Health- An Introduction to Community Dentistry. Edition by Geoffrey L. Slack and Brain Burt, Published by John Wrigth and sons Bristol, 1980
7. Oral Health Surveys- Basic Methods, 4th edition, 1997, published by W. H. O. Geneva available at the regional office New Delhi.
8. Preventive Medicine and Hygiene-By Maxcy and Rosenau, published by Appleton Century Crofts, 1986.
9. Preventive Dentistry-by J. O. Forrest published by John Wright and sons Bristoli, 1980.
10. Preventive Dentistry by Murray, 1997.
11. Text Book of Preventive and Social Medicine by Park and park, 14th edition.
12. Community Dentistry by Dr. Soben Peter.
13. Introduction to Bio-statistics by B. K. Mahajan
14. Research methodology and Bio-statistics by
15. Introduction to Statistical Methods by Grewal

17. PERIODONTOLOGY

OBJECTIVES:

The student shall acquire the skill to perform dental scaling ,diagnostic tests of periodontal diseases; to use the instruments for periodontal therapy and maintenance of the same.

The student shall develop attitude to impart the preventive measures namely, the prevention of periodontal diseases and prevention of the progress of the disease. The student shall also develop an attitude to perform the treatment with full aseptic precautions; shall develop an attitude to prevent iatrogenic diseases; to conserve the tooth to the maximum possible time by maintaining periodontal health and to refer the patients who require specialist's care.

1. Introduction: Definition of Periodontology, Periodontics, Periodontia, Brief historical background, Scope of Periodontics
2. Development of perio-dontal tissues, micro-structural anatomy and biology of periodontal tissues in detail Gingiva. Junctional epithelium in detail, Epithelial-Mesenchymal interaction,Periodontal, ligament Cementum, Alveolar bone.
3. Defensive mechanisms in the oral cavity: Role of-Epithelium,Gingival fluid, Saliva and other defensive mechanisms in the oral environment.

4.	Age changes in periodontal structures and their significance in Geriatric dentistry	Age changes in teeth and periodontal structures and their association with periodontal diseases	1
5.	Classification of periodontal diseases	Need for classification, Scientific basis of classification Classification of gingival and periodontal diseases as described in World Workshop1989 Gingivitis: Plaque associated,ANUG,steroid hormone influenced, Medication influenced, Desquamative gingivitis, other forms of gingivitis as in nutritional deficiency, bacterial and viral infections etc.	1

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		Periodontitis: Adult periodontitis, Rapidly progressive periodontitis A&B, Juvenile periodontitis(localized, generalized, and post-juvenile), Prepubertal periodontitis, Refractory periodontitis	
6.	Gingival diseases	Localized and generalized gingivitis, Papillary, marginal and diffuse gingivitis Etiology, pathogenesis, clinical signs, symptoms and management of i) Plaque associated gingivitis ii) Systemically aggravated gingivitis(sex hormones, drugs and systemic diseases) iii) ANUG iv) Desquamative gingivitis-Gingivitis associated with lichen planus, pemphigoid, pemphigus, and other vesiculobullous lesions v) Allergic gingivitis vi) Infective gingivitis-Herpetic, bacterial and candidial vii) Pericoronitis viii) Gingival enlargement (classification and differential diagnosis)	6
7	Epidemiology of periodontal diseases	- Definition of index, incidence, prevalence,epidemiology,endemic, epidemic, and pandemic - Classification of indices(Irreversible and reversible) - Deficiencies of earlier indices used in Periodontics - Detailed understanding of Silness &Loe Plaque Index ,Loe&Silness Gingival Index, CPITN &CPI. - Prevalence of periodontal diseases in India and other countries. - Public health significance(All these topics are covered at length under community dentistry. Hence, the topics may be discussed briefly. However, questions may be asked from the topics for examination	2
8.	Extension of inflammation from gingiva	Mechanism of spread of inflammation from gingival area to deeper periodontal structures Factors that modify the spread	1
9.	Pocket	Definition, signs and symptoms, classification, pathogenesis, histopathology, root surface changes and contents of the pocket	2
10.	Etiology	- Dental Plaque (Biofilm) - Definition, New concept of biofilm - Types, composition, bacterial colonization, growth,maturation &disclosing agents - Role of dental plaque in periodontal diseases - Plaque microorganisms in detail and bacteria associated with periodontal diseases - Plaque retentive factors - Materia alba - Food debris - Calculus - Definition - Types, composition, attachment, theories of formation - Role of calculus in disease Food Impaction - Definition - Types, Etiology - Hirschfelds' classification - Signs ,symptoms &sequelae of treatment Trauma from occlusion - Definition, Types - Histopathological changes - Role in periodontal disease - Measures of management in brief Habits - Their periodontal significance - Bruxism &parafunctional habits, tongue thrusting ,lip biting, occupational habits IATROGENIC FACTORS	5

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		Conservative Dentistry - Restorations - Contact point, marginal ridge, surface roughness, overhanging restorations, interface between restoration and teeth Prosthodontics - Interrelationship - Bridges and other prosthesis, pontics(types) ,surface contour, relationships of margins to the periodontium, Gingival protection theory, muscle action theory& theory of access to oral hygiene. Orthodontics - Interrelationship, removable appliances &fixed appliances - Retention of plaque, bacterial changes Systemic diseases - Diabetes, sex hormones, nutrition(Vit.C &proteins) - AIDS & periodontium - Hemorrhagic diseases, Leukemia, clotting factor disorders,PMN disorders	
11.	Risk factors	Definition. Risk factors for periodontal diseases	1
12.	Host response	- Mechanism of initiation and progression of periodontal diseases - Basic concepts about cells, Mast cells, neutrophils, macrophages, lymphocytes, immunoglobulins, complement system, immune mechanisms & cytokines in brief - Stages in gingivitis-Initial, early, established & advanced - Periodontal disease activity, continuous paradigm, random burst & asynchronous multiple burst hypothesis	3
13.	Periodontitis	- Etiology ,histopathology, clinical signs & symptoms, diagnosis and treatment of adult periodontitis - Periodontal abscess; definition, classification, pathogenesis, differential diagnosis and treatment - Furcation involvement, Glickmans' classification, prognosis and management - Rapidly progressive periodontitis - Juvenile periodontitis: Localized and generalized - Post-juvenile periodontitis - Periodontitis associated with systemic diseases - Refractory periodontitis	6
14.	Diagnosis	- Routine procedures, methods of probing, types of probes,(According to case history) - Halitosis: Etiology and treatment. Mention advanced diagnostic aids and their role in brief.	2
15.	Prognosis	- Definition, types, purpose and factors to be taken into consideration	1
16.	Treatment plan	- Factors to be considered	1
17.	Periodontal therapy	A. General principles of periodontal therapy. Phase I,II, III, IV therapy. Definition of periodontal regeneration, repair, new attachment and reattachment. B. Plaque control i. Mechanical tooth brushes, interdental cleaning aids, dentifrices ii. Chemical; classification and mechanism of action of each & pocket irrigation	3
18.	Pocket eradication procedures	- Scaling and root planing: - Indications - Aims & objectives - Healing following root planning - Hand instruments, sonic, ultrasonic &piezo-electric scalers - Curettage &present concepts - Definition - Indications - Aims &objectives - Procedures & healing response - Flap surgery - Definition - Types of flaps, Design of flaps, papilla preservation	5

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		- Indications & contraindications - Armamentarium - Surgical procedure & healing response	
9.	Osseous Surgery	Osseous defects in periodontal disease - Definition - Classification - Surgery: resective, additive osseous surgery (osseous grafts with classification of grafts) - Healing responses - Other regenerative procedures; root conditioning - Guided tissue regeneration	2
20.	Mucogingival surgery &periodontal plastic surgeries	Definition Mucogingival problems: etiology, classification of gingival recession (P.D.Miller Jr. and Sullivan and Atkins) Indications & objectives Gingival extension procedures: lateral pedicle graft, frenectomy, frenotomy Crown lengthening procedures Periodontal microsurgery in brief	3
21.	Splints	- Periodontal splints - Purpose & classification - Principles of splinting	1
22.	Hypersensitivity	Causes, Theories & management	1
23.	Implants	Definition, types, scope &biomaterials used. Periodontal considerations: such as implant-bone interface, implant-gingiva interface, implant failure, peri-implantitis & management	1
24.	Maintenance phase (SPT)	- Aims, objectives, and principles - Importance - Procedures - Maintenance of implants	1
25.	Pharmaco-therapy	- Periodontal dressings - Antibiotics & anti-inflammatory drugs - Local drug delivery systems	2
26.	Periodontal management of medically compromised patients	Topics concerning periodontal management of medically compromised patients	1
27.	Inter-disciplinary care	- Pulpo-periodontal involvement - Routes of spread of infection - Simons' classification - Management	1
28.	Systemic effects of periodontal diseases in brief	Cardiovascular diseases, Low birth weight babies etc.	1
29.	Infection control protocol	Sterilization and various aseptic procedures	1
30.	Ethics		

TUTORIALS DURING CLINICAL POSTING;

1. Infection control
2. Periodontal instruments
3. Chair position and principles of instrumentation
4. Maintenance of instruments (sharpening)
5. Ultrasonic, Piezoelectric and sonic scaling – demonstration of technique
6. Diagnosis of periodontal disease and determination of prognosis
7. Radiographic interpretation and lab investigations
8. Motivation of patients- oral hygiene instructions

Students should be able to record a detailed periodontal case history, determine diagnosis, prognosis and plan treatment. Student should perform scaling, root planning local drug delivery and SPT. Shall be given demonstration of all periodontal surgical procedures.

DEMONSTRATIONS:

1. History taking and clinical examination of the patients
2. Recording different indices
3. Methods of using various scaling and surgical instruments
4. Polishing the teeth
5. Bacterial smear taking
6. Demonstration to patients about different oral hygiene aids

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7. Surgical procedures- gingivectomy, gingivoplasty, and flap operations
8. Follow up procedures, post operative care and supervision

REQUIREMENTS:

1. Diagnosis, treatment planning and discussion and total periodontal treatment – 25 cases
2. Dental scaling, oral hygiene instructions – 50 complete cases/ equivalent
3. Assistance in periodontal surgery – 5 cases
4. A work record should be maintained by all the students and should be submitted at the time of examination after due certification from the head of the department.

Students should have to complete the work prescribed by the concerned department from time to time and submit a certified record for evaluation.

PRESCRIBED BOOK:

1. Glickman's Clinical Periodontology — Carranza

REFERENCE BOOKS

1. Essentials of Periodontology and periodontics- Torquil MacPhee
2. Contemporary periodontics- Cohen
3. Periodontal therapy- Goldman
4. Orbans' periodontics- Orban
5. Oral Health Survey- W.H.O.
6. Preventive Periodontics- Young and Stiffler
7. Public Health Dentistry- Slack
8. Advanced Periodontal Disease- John Prichard
9. Preventive Dentistry- Forrest
10. Clinical Periodontology- Jan Lindhe
11. Periodontics- Baer & Morris.

18. PROSTHODONTICS AND CROWN & BRIDGE

Complete Dentures

A. Applied Anatomy and Physiology.
   1. Introduction
   2. Biomechanics of the edentulous state.
   3. Residual ridge resorption.

B. Communicating with the patient
   1. Understanding the patients.
      - Mental attitude.
   2. Instructing the patient.

C. Diagnosis and treatment planning for patients-
   1. With some teeth remaining.
   2. With no teeth remaining.
   a) Systemic status.
   b) Local factor.
   c) The geriatric patient.
   d) Diagnostic procedures.

D. Articulators- discussion

E. Improving the patient's denture foundation and ridge relation -an overview.
   a) Pre-operative examination.
   b) Initial hard tissue & soft tissue procedure.
   c) Secondary hard & soft tissue procedure.
   d) Implant procedure.
   e) Congenital deformities.
   f) Postoperative procedure.

F. Principles of Retention, Support and Stability

G. Impressions - detail.
   a) Muscles of facial expression.
   b) Biologic considerations for maxillary and mandibular impression including anatomy landmark and their interpretation.
   c) Impression objectives.
   d) Impression materials.
   e) Impression techniques.
   f) Maxillary and mandibular impression procedures.
   i. Preliminary impressions.
   ii. Final impressions.
   g) Laboratory procedures involved with impression making (Beading & Boxing, and cast preparation).

H. Record bases and occlusion rims- in detail.
   a) Materials & techniques.
   b) Useful guidelines and ideal parameters.
   c) Recording and transferring bases and occlusal rims.

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I. Biological consideration in jaw relation & jaw movements - craniomandibular relations.
   a) Mandibular movements.
   b) Maxillo -mandibular relation including vertical and horizontal jaw relations.
   c) Concept of occlusion- discuss in brief.

J. Relating the patient to the articulator.
   a) Face bow types & uses– discuss in brief.
   b) Face bow transfer procedure - discuss in brief.

K. Recording maxillo mandibular relation.
   a) Vertical relations.
   b) Centric relation records.
   c) Eccentric relation records.
   d) Lateral relation records.

L. Tooth selection and arrangement.
   a) Anterior teeth.
   b) Posterior teeth.
   c) Esthetic and functional harmony.

M. Relating inclination of teeth to concept of occlusion- in brief.
   a) Neutrocentric concept.
   b) Balanced occlusal concept.

N. Trial dentures.

O. Laboratory procedures.
   a) Wax contouring.
   b) Investing of dentures.
   c) Preparing of mold.
   d) Preparing & packing acrylic resin.
   e) Processing of dentures.
   f) Recovery of dentures.
   g) Lab remount procedures.
   h) Recovering the complete denture from the cast.
   i) Finishing and polishing the complete denture.
   j) Plaster cast for clinical denture remount procedure.

P. Denture insertion.
   a) Insertion procedures.
   b) Clinical errors.
   c) Correcting occlusal disharmony.
   d) Selective grinding procedures.

R. Treating problems with associated denture use – discuss in brief (tabulation/flow-chart form).

S. Treating abused tissues - discuss in brief.

T. Relining and rebasing of dentures- discuss in brief.

V. Immediate complete dentures construction procedure- discuss in brief.

W. The single complete denture- discuss in brief.

X. Overdentures denture- discuss in brief.

Y. Dental implants in complete denture - discuss in brief.

Note : It is suggested that the above mentioned topics be dealt with wherever appropriate in the following order so as to cover –

1. Definition
2. Diagnosis (of the particular situation/patient selection/treatment planning)
3. Types / Classification
4. Materials
5. Methodology – Lab /Clinical
6. Advantages & disadvantages
7. Indications, contraindications
8. Maintenance Phase
9. Oral Implantology
10. Ethics

Removable Flexible Dentures

1. Introduction
   - Terminologies and scope
2. Classification.
3. Examination, Diagnosis & Treatment planning & evaluation of diagnostic data.
4. Components of a removable partial denture.
   - Major connectors,
   - minor connectors,
   - Rest and rest seats.
5. Components of a Removable Partial Denture.
   - Direct retainers,
   - Indirect retainers,
   - Tooth replacement.

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6. Principles of Removable Partial Denture Design.
7. Survey and design – in brief.
   - Surveyors.
   - Surveying.
   - Designing.
8. Mouth preparation and master cast.
9. Impression materials and procedures for removable partial dentures.
10. Preliminary jaw relation and esthetic try-in for some anterior replacement teeth.
11. Laboratory procedures for framework construction-in brief.
12. Fitting the framework - in brief.
13. Try-in of the partial denture - in brief.
14. Completion of the partial denture - in brief.
15. Inserting the Removable Partial Denture - in brief.
16. Postinsertion observations.
17. Temporary Acrylic Partial Dentures.
18. Immediate Removable Partial Denture.
19. Removable Partial Dentures opposing Complete denture.

Note : It is suggested that the above mentioned topics be dealt with wherever appropriate in the following order so as to cover –

1. Definition
2. Diagnosis (of the particular situation /patient selection /treatment planning)
3. Types / Classification
4. Materials
5. Methodology – Lab / Clinical
6. Advantages & disadvantages
7. Indications, contraindications
8. Maintenance Phase

Fixed Partial Dentures

Topics To Be Covered In Detail -

1. Introduction
2. Fundamentals of occlusion – in brief.
3. Articulators – in brief.
4. Treatment planning for single tooth restorations.
5. Treatment planning for the replacement of missing teeth including selection and choice of abutment teeth.
6. Fixed partial denture configurations.
7. Principles of tooth preparations.
8. Preparations for full veneer crowns – in detail.
9. Preparations for partial veneer crowns – in brief.
10. Provisional Restorations
11. Fluid Control and Soft Tissue Management
12. Impressions
13. Working Casts and Dies
14. Wax Patterns
15. Pontics and Edentulous Ridges
16. Esthetic Considerations
17. Finishing and Cementation

Topics To Be Covered In Brief -

1. Solder Joints and Other Connectors
2. All - Ceramic Restorations
3. Metal - Ceramic Restorations
4. Preparations of intracoronal restorations.
5. Preparations for extensively damaged teeth.
6. Preparations for periodontally weakened teeth
7. The Functionally Generated Path Technique
8. Investing and Casting
9. Resin - Bonded Fixed Partials Denture

Note : It is suggested that the above mentioned topics be dealt with wherever appropriate in the following order so as to cover –

1. Definition
2. Diagnosis(of the particular situation /patient selection /treatment planning)
3. Types / Classification
4. Materials
5. Methodology – Lab / Clinical
6. Advantages & disadvantages
7. Indications, contraindications
8. Maintenance Phase

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RECOMMENDED BOOKS:

1. Syllabus of Complete denture by - Charles M. Heartwell Jr. and Arthur O. Rahn.
2. Boucher's "Prosthodontic treatment for edentulous patients"
3. Essentials of complete denture prosthodontics by – Sheldon Winkler.
4. Maxillofacial prosthetics by – Willam R.Laney.
5. McCraken's Removable partial prosthodontics
6. Removable partial prosthdontics by – Ernest L. Miller and Joseph E. Grasso.

19. AESTHETIC DENTISTRY

Aesthetic Dentistry is gaining more popularity since last decade. It is better that undergraduate students should understand the philosophy and scientific knowledge of the esthetic dentistry.

1. Introduction and scope of esthetic dentistry
2. Anatomy & physiology of smile
3. Role of the colour in esthetic dentistry
4. Simple procedures (roundening of central incisors to enhance esthetic appearance)
5. Bleaching of teeth
6. Veneers with various materials
7. Prevedntive and interceptive esthetics
8. Ceramics
9. Simple gingival contouring to enhance the appearance
10. Simple clinical procedures for BDS students

Recommended books:

1. Esthetic guidelines for restorative dentistry; Scharer & others
2. Esthetics of anterior fixed prosthodontics; Chiche (GJ) & Pinault (Alain)
3. Esthetic & the treatment of facial form, Vol 28; Mc Namara (JA)

20. FORENSIC ODONTOLOGY (30 hrs of instruction)

Definition

Forensic is derived from the Latin word forum, which means 'court of law.' Odontology literally implies 'the study of teeth.' Forensic odontology, therefore, has been defined by the Fédération Dentaire International (FDI) as "that branch of dentistry which, in the interest of justice, deals with the proper handling and examination of dental evidence, and with the proper evaluation and presentation of dental findings."

Objectives of the undergraduate curriculum

At the end of the programme, the dental graduate should:

1. Have sound knowledge of the theoretical and practical aspects of forensic odontology.
2. Have an awareness of ethical obligations and legal responsibilities in routine practice and forensic casework.
3. Be competent to recognise forensic cases with dental applications when consulted by the police, forensic pathologists, lawyers and associated professionals.
4. Be competent in proper collection of dental evidence related to cases of identification, ethnic and sex differentiation, age estimation and bite marks.
5. Be able to assist in analysis, evaluation, and presentation of dental facts within the realm of law.

Curriculum for forensic odontology

1. Introduction to forensic dentistry
   - Definition and history
   - Recent developments and future trends
2. Overview of forensic medicine and toxicology
   - Cause of death and postmortem changes
   - Toxicological manifestations in teeth and oral tissues
3. Dental identification
   - Definition
   - Basis for dental identification
   - Postmortem procedures
   - Dental record compilation and interpretation
   - Comparison of data, and principles of report writing
   - Identification in disasters and handling incinerated remains
   - Postmortem changes to oral structures
4. Maintaining dental records
   - Basic aspects of good record-keeping
   - Different types of dental records
     - Dental charts
     - Dental radiographs
     - Study casts
     - Denture marking
     - Photographs

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- Dental notations
- Relevance of dental records in forensic investigation

5. Age estimation
   - Age estimation in children and adolescents
     - Advantages of tooth calcification over 'eruption' in estimating age
     - Radiographic methods of Schour & Massler, Demirjian et al
   - Age estimation in adults
     - Histological methods – Gustafson's six variables and Johanson's modification, Bang & Ramm's dentine translucency
     - Radiographic method of Kvaal et al
   - Principles of report writing
6. Sex differentiation
   - Sexual dimorphism in tooth dimensions (Odontometrics)
7. Ethnic variations ('racial' differences) in tooth morphology
   - Description of human population groups
   - Genetic and environmental influences on tooth morphology
   - Description of metric and non-metric dental features used in ethnic differentiation
8. Bite mark procedures
   - Definition and classification
   - Basis for bite mark investigation
   - Bite mark appearance
   - Macroscopic and microscopic ageing of bite marks
   - Evidence collection from the victim and suspect of bite mark
   - Analysis and comparison
   - Principles of report writing
   - Animal bite investigation
9. Dental DNA methods
   - Importance of dental DNA evidence in forensic investigations
   - Types of DNA and dental DNA isolation procedures
   - DNA analysis in personal identification
   - Gene-linked sex dimorphism
   - Population genetics
10. Jurisprudence and ethics
    - Fundamentals of law and the constitution
    - Medical legislation and statutes (Dental and Medical Council Acts, etc)
    - Basics of civil law (including torts, contracts and consumer protection act)
    - Criminal and civil procedure code (including expert witness requirement)
    - Assessment and quantification of dental injuries in courts of law
    - Medical negligence and liability
    - Informed consent and confidentiality
    - Rights and duties of doctors and patients
    - Medical and dental ethics (as per Dentists' Act)

Theory sessions and practical exercises

Total hours for the course

- Didactic – 10-12 hours
- Practical – 20-25 hours

Detailed didactic sessions for the above components, either in the form of lectures or as structured student-teacher interactions, is essential. Specialists from multiple disciplines, particularly from legal and forensic sciences, can be encouraged to undertake teaching in their area of expertise.

An interactive, navigable and non-linear (INN) model may also be utilised for education.

Practical exercises (real-life casework and/or simulated cases) must complement didactic sessions to facilitate optimal student understanding of the subject. Mandatory practical training in dental identification methods, dental profiling (ethnic and sex differences, radiographic age estimation), and bite mark procedures, is of paramount importance. In addition, practical exercises/demonstrations in histological age estimation, comparative dental anatomy, DNA methods, medical autopsy, court visits, and other topics may be conducted depending on available expertise, equipment and feasibility.

Approach to teaching forensic odontology

Forensic odontology could be covered in two separate streams. The divisions include a preclinical stream and a clinical stream.

Preclinical stream

- Introduction to forensic odontology
- Sex differences in odontometrics
- Ethnic variations in tooth morphology
- Histological age estimation
- Dental DNA methods

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- Bite marks procedures
- Overview of forensic medicine and toxicology

It could prove useful to undertake the preclinical stream in II or III year under Oral Biology/Oral Pathology since these aspects of forensic odontology require grounding in dental morphology, dental histology and basic sciences, which, students would have obtained in I and/or II BDS.

Clinical stream

- Dental identification
- Maintaining dental records
- Radiographic age estimation
- Medical jurisprudence and ethics

It would be suitable to undertake these topics in the IV or V year as part of Oral Medicine and Radiology, since students require reasonable clinical exposure and acumen to interpret dental records, perform dental postmortems and analyse dental radiographs for age estimation.

21. ORAL IMPLANTOLOGY (30 hrs of instruction)

INTRODUCTION TO ORAL IMPLANTOLOGY

Oral Implantology is now emerged as a new branch in dentistry world wide and it has been given a separate status in the universities abroad. In India day to day the practice of treating patients with implants are on rise. In this contest inclusion of this branch into under graduate curriculum has become very essential. The objective behind this is to impart basic knowledge of Oral Implantology to undergraduates and enable them to diagnose, plan the treatment and to carry out the needed pre surgical mouth preparations and treat or refer them to speciality centres. This teaching programme may be divided and carried out by the Dept. of Oral Surgery, Prosthodontics and Periodontics.

1. History of implants, their design & surface characteristics and osseo-integration
2. Scope of oral & maxillofacial implantology & terminologies
3. A brief introduction to various implant systems in practice
4. Bone biology, Morphology, Classification of bone and its relevance to implant treatment and bone augmentation materials.
5. Soft tissue considerations in implant dentistry
6. Diagnosis & treatment planning in implant dentistry
   Case history taking/Examination/Medical evaluation/Orofacial evaluation/ Radiographic evaluation/ Diagnostic evaluation/ Diagnosis and treatment planning/ treatment alternatives/ Estimation of treatment costs/ patient education and motivation
7. Pre surgical preparation of patient
8. Implant installation & armamentarium for the Branemark system as a role model
9. First stage surgery – Mandible – Maxilla
10. Healing period & second stage surgery
11. Management of surgical complications & failures
12. General considerations in prosthodontic reconstruction & Bio mechanics
13. Prosthodontic components of the Branemark system as a role model
14. Impression procedures & Preparation of master cast
15. Jaw relation records and construction of suprastructure with special emphasis on occlusion for osseointegrated prosthesis
16. Management of prosthodontic complications & failures
17. Recall & maintenance phase.

Criteria for success of osseointegrated implant supported prosthesis

SUGGESTED BOOKS FOR READING

1. Contemporary Implant Dentistry - Carl .E. Misch
   Mosby 1993 First Edition.
2. Osseointegration and Occlusal Rehabilitation - Hobo S., Ichida. E. and Garcia L.T.
   Quintessence Publishing Company, 1989 First Edition.

22. BEHAVIOURAL SCIENCES (20 hrs of instruction)

GOAL:

The aim of teaching behavioural sciences to undergraduate student is to impart such knowledge & skills that may enable him to apply principles of behaviour –

a) For all round development of his personality
b) In various therapeutic situations in dentistry.

The student should be able to develop skills of assessing psychological factors in each patient, explaining stress, learning simple counselling techniques, and improving patients compliance behaviour.

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OBJECTIVES:

A) KNOWLEDGE & UNDERSTANDING:

At the end of the course, the student shall be able to:

1) Comprehend different aspects of normal behaviour like learning, memory, motivation, personality & intelligence.
2) Recognise difference between normal and abnormal behaviour.
3) Classify psychiatric disorders in dentistry.
4) Recognise clinical manifestations of dental phobia, dental anxiety, facial pain, orofacial manifestations of psychiatric disorders, and behavioural problems in children. Addictive disorders, psychological disorders in various dental departments.
5) Should have understanding of stress in dentistry and knowledge of simple counselling techniques.
6) Have some background knowledge of interpersonal, managerial and problem solving skills which are an integral part of modern dental practice.
7) Have knowledge of social context of dental care.

B) SKILLS

The student shall be able to:

1) Interview the patient and understand different methods of communication skills in dentist - patient relationship.
2) Improve patients compliance behaviour.
3) Develop better interpersonal, managerial and problem solving skills.
4) Diagnose and manage minor psychological problems while treating dental patients.

INTEGRATION:

The training in Behavioural sciences shall prepare the students to deliver preventive, promotive, curative and rehabilitative services to the care of the patients both in family and community and refer advanced cases to specialised psychiatric hospitals.

Training should be integrated with all the departments of Dentistry, Medicine, Pharmacology, Physiology and Biochemistry.

PSYCHOLOGY:

1. Definition & Need of Behavioural Science. Determinants of Behaviour. Hrs 1 Scope of Behavioural Science.
2. Sensory process & perception perceptual process- clinical applications.
3. Attention - Definition - factors that determine attention. Clinical application.
4. Memory - Memory process - Types of memory , Forgetting:
   Methods to improve memory, Clinical assessment of memory & clinical applications.
5. Definition - Laws of learning
   Type of learning. Classical conditioning, operant conditioning, cognitive learning, Insight learning, social learning, observational learning, principles of learning– Clinical application.
6. Intelligence- Definition: Nature of intelligence stability of intelligence
   Determinants of intelligence, clinical application
7. Thinking - Definition: Types of thinking, delusions, problem solving
8. Motivation - Definition: Motive, drive, needs classification of motives
9. Emotions - Definition differentiation from feelings – Role of hypothalamus, Cerebral cortex, adrenal glands ANS. Theories of emotion, Types of emotions.
   Personality. Assessment of personality: Questionnaires, personality inventory, rating scales, Interview projective techniques – Rorshach ink blot test , RAT, CAT

SOCIOLOGY:

Social class, social groups – family, types of family, types of marriages, communities and Nations and institutions.

REFERENCE BOOKS:

1. General psychology -- S.K. Mangal
2. General psychology -- Hans Raj, Bhatia
3. General psychology -- Munn
4. Behavioural Sciences in Medical practise -- Manju Mehta
5. Sciences basic to psychiatry -- Basanth Puri & Peter J Tyrer

23. ETHICS (20 hrs. of instruction)

Introduction:

There is a definite shift now 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, their 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 professionals 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

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develop human values Council desires that all the trainees undergo ethical sensitization by lectures or discussion on ethical issues, discussion of cases with an important ethical component.

Course content:

Introduction to ethics –

- what is 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 of Geneva, International code of ethics, DCI 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

Profession 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 our criteria towards decisions

Recommended Reading:

Medical Ethics, Francis C.M., I Ed. 1993, Jaypee Brothers, New Delhi p. 189.

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Annexure-A

DENTAL COUNCIL OF INDIA
Revised Internship Programme, 2011

CURRICULUM OF DENTAL INTERNSHIP PROGRAMME.

1. The duration of Internship shall be one year.
2. All parts of internship shall be done in a Dental College duly recognized/approved by the Dental Council of India for the purpose of imparting education and training to Dental graduates in the country.
3. The Internss shall be paid stipendiary allowance during the period of an Internship not extending beyond a period of one year.
4. The internship shall be compulsory and rotating as per the regulations prescribed for the purpose.
5. The degree- BDS shall be granted after completion of internship.

Determinants of Curriculum for internship for Dental Graduates:

The curricular contents of internship training shall be based on.

i) Dental health needs of the society.
ii) Financial, material and manpower resources available for the purpose.
iii) National Dental Health Policy.
iv) Socio-economic conditions of the people in general.
v) Existing Dental as also the primary health care concept, for the delivery of health services.
vi) Task analysis of what graduates in Dentistry in various practice settings, private and government service actually perform.
vii) Epidemiological studies conducted to find out prevalence of different dental health problems, taking into consideration the magnitude of dental problems, severity of dental problems and social disruption caused by these problems.

Objectives:

A. To facilitate reinforcement of learning and acquisition of additional knowledge:-
   a) Reinforcement of knowledge.
   b) Techniques & resources available to the individual and the community; Social and cultural setting.
   c) Training in a phased manner, from a shared to a full responsibility.

B. To facilitate the achievement of basic skills: attaining competence Vs. maintaining competence in:-
   i) History taking.
   ii) Clinical Examination.
   iii) Performance and interpretation of essential laboratory data.
   iv) Data analysis and inference.
   v) Communication skills aimed at imparting hope and optimism in the patient.
   vi) Attributes for developing working relationship in the Clinical setting and Community team work.

C To facilitate development of sound attitudes and habits:-
   i) Emphasis on individual and human beings, and not on disease/symptoms.
   ii) Provision of comprehensive care, rather than fragmentary treatment.
   iii) Continuing Dental Education and Learning of accepting the responsibility.

D To facilitate understanding of professional and ethical principles:-
   - Right and dignity of patients.
   - Consultation with other professionals and referral to seniors/institutions.
   - Obligations to peers, colleagues, patients, families and Community.
   - Provision of free professional services in an emergent situation.

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E To initiate individual and group action, leading to disease prevention and dental health promotion, at the level of individuals families and the community.

Content (subject matter)

The compulsory rotating paid Dental Internship shall include training in Oral Medicine & Radiology; Oral & Maxillofacial Surgery; Prosthodontics; Periodontics; Conservative Dentistry; Pedodontics; Oral Pathology & Microbiology; Orthodontics and Community Dentistry.

General Guidelines:

1. It shall be task-oriented training. The interns should participate in various institutional and field programmes and be given due responsibility to perform the activities in all departments of the Dental Colleges and associated Institutions.
2. To facilitate achievement of basic skills and attitudes the following facilities should be provided to all dental graduates:
   - i) History taking, examination, diagnosis, charting and recording treatment plan of cases.
   - ii) Presentation of cases in a group of Seminar.
   - iii) Care and sterilization of instruments used.
   - iv) Performance and interpretation of essential laboratory tests and other relevant investigations.
   - v) Data analysis and inference.
   - vi) Proper use of antibiotics, anti-inflammatory and other drugs, as well as other therapeutic modalities.
   - vii) Education of patients, their relatives and community on all aspects of dental health care while working in the institution as also in the field.
   - viii) Communication aimed at inspiring hope. confidence and optimism.
   - ix) Legal rights of patients and obligations of dental graduate under forensic jurisprudence.

1. **Oral Medicine & Radiology:**

1.	Standardized examination of patients	25 Cases
2.	Exposure to clinical, pathological laboratory procedures and biopsies.	5 Cases
3.	Effective training in taking of Radiographs:	2 Full mouth
	(Intra-oral) I.O. (Extra oral) E.O.	1
	Cephalogram	1
4.	Effective management of cases in wards	2 Cases

2. **Oral and Maxillofacial surgery**

A. The Interness during their posting in oral surgery shall perform the following procedures:

1.	Extractions	50
2.	Surgical extractions	2
3.	Impactions	2
4	Simple Intra Maxillary Fixation	1
5	Cysts enucleations	1
6.	Incision and drainage	2
7.	Alveoloplasties, Biopsies & Frenectomies, etc.	3

B. The Interness shall perform the following on Cancer Patients:
   1. Maintain file work.
   2. Do extractions for radiotherapy cases.
   3. Perform biopsies.
   4. Observe varied cases of oral cancers.

C. The interness shall have 15 days posting in emergency services of a dental/general hospital with extended responsibilities in emergency dental care in the wards. During this period they shall attend to all emergencies under the direct supervision of oral surgeon during any operation:

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1. **Emergencies.**
   (i) Toothache; (ii) trigemminal neuralgia; (iii) Bleeding from mouth due to trauma, post extraction, bleeding disorder or haemophylia; (iv) Airway obstruction due to fracture mandible and maxilla; dislocation of mandible; syncope or vasovagal attacks; ludwig's angina; tooth fracture; post intermaxillary fixation after general Anaesthesia.
2. Work in I.C.U. with particular reference to resuscitation procedures.
3. Conduct tutorials on medico-legal aspects including reporting on actual cases coming to casualty. They should have visits to law courts.

3. **Prosthodontics**

The dental graduates during their internship posting in Prosthodontics shall make:-

1.	Complete denture (upper & lower)	2
2.	Removable Partial Denture	4
3.	Fixed Partial Denture	1
4.	Planned cast partial denture	1
5.	Miscellaneous-like reline/overdenture/repairs of Maxillofacial Prosthesis	1
6.	Learning use of Face bow and Semi anatomic articulator technique	
7.	Crowns	
8.	Introduction of Implants	1

4. **Periodontics**

A. The dental graduates shall perform the following procedures

1.	Prophylaxis	15 Cases
2.	Flap Operation	2 Cases
3.	Root Planning	1 Case
4.	Currettage	1 Case
5.	Gingivectomy	1 Case
6.	Perio-Endo cases	1 Case

B. During their one week posting in the community health centers, the internss shall educate the public in prevention of Periodontal diseases.

5. **Conservative Dentistry**

To facilitate reinforcement of learning and achievement of basic skills, the interns shall perform atleast the following procedures independently or under the guidance of supervisors:

1.	Restoration of extensively mutilated teeth	5 Cases
2.	Inlay and onlay preparations	1 Case
3.	Use of tooth coloured restorative materials	4 Cases
4.	Treatment of discoloured vital and non-vital teeth	1 Case
5.	Management of dento alveolar fracture	1 Case
6.	Management of pulpless, single-rooted teeth without periapical lesion.	4 Cases
7.	Management of acute dento alveolar Infections	2 Cases
8.	Management of pulpless, single-rooted teeth with periapical lesion.	1 Case
9.	Non-surgical management of traumatised teeth during formative period.	

6. **Pedodontics and Preventive Dentistry**

During their posting in Pedodontics the Dental graduates shall perform:

1.	Topical application of fluorides including varnish	5 Cases
2.	Restorative procedures of carious deciduous teeth in children.	10 Cases
3.	Pulpotomy	2 Cases
4.	Pulpectomy	2 Cases
5.	Fabrication and insertion of space maintainers	1 Case

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6. Oral habit breaking appliances — 1 Case

7. **Oral Pathology and Microbiology**

The interns shall perform the following:

1. History-recording and clinical examination — 5 Cases
2. Blood, Urine and Sputum examination — 5 Cases
3. Exfoliative Cytology and smears study — 2 Cases
4. Biopsy- Laboratory Procedure & reporting — 1 Case

8. **Orthodontics**

A. The interns shall observe the following procedures during their posting in Orthodontics:

1. Detailed diagnostic procedures for 5 patients
2. Laboratory techniques including wire-bending for removable appliances, soldering and processing of myo-functional appliances.
3. Treatment planning options and decisions.
4. Making of bands, bonding procedures and wire insertions.
5. Use of extra oral anchorage and observation of force values.
6. Retainers.
7. Observe handling of patients with oral habits causing malocclusions.

The dental graduates shall do the following laboratory work:-

1. Wire bending for removable appliances and space maintainers including weldoing and heat treatment procedure. - 5 Cases
2. Soldering exercises, banding & bonding procedures - 2 Cases
3. Cold-cure and heat-cure acrylisation of simple Orthodontic appliances - 5 Cases

9. **Public Health Dentistry**

1. The internss shall conduct health education sessions for individuals and groups on oral health public health nutrition, behavioral sciences, environmental health, preventive dentistry and epidemiology.
2. They shall conduct a short term epidemiological survey in the community, or I n the alternate, participate in the planning and methodology.
3. They shall arrange effective demonstrations of:
   a) Preventive and interceptive procedures for prevalent dental diseases.
   b) Mouth-rinsing and other oral hygiene demonstrations — 5 Cases
   c) Tooth brushing techniques — 5 Cases
4. Conduction of oral health education programmes at
   A) School setting — 2
   B) Community setting — 2
   C) Adult education programmes — 2
5. Preparation of Health Education materials — 5
6. Exposure to team concept and National Health Care systems:
   a) Observation of functioning of health infrastructure.
   b) Observation of functioning of health casre team including multipurpose workers male and female, health educators and other workers.
   c) Observation of atleast one National Health Programme:-
   d) Observation of interlinkages of delivery of oral health care with Primary Health care.

   Mobile dental clinics, as and when available, should be provided for this teachings.

10 **Elective Posting**

The Interns shall be posted for 15 days in any of the dental departments of their choice mentioned in the foregoing.

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Organisation of content:

The Curriculum during the 4 years of BDS training is subject based with more emphasis on learning practical skills. During one year internship the emphasis will be on competency-based, community oriented training. The practical skills to be mastered by the interns along with the minimum performance level are given under the course content of different departments of Dental Education. The supervisors should seding it that proper facilities are provided in all departments and attached institutions for their performance.

Specification of teaching activities:

Didactic lectures are delivered during the four years training in BDS. These shall be voided during the internship programme. Emphasis shall be on chair-side teaching, small group teaching and discussions tutorials, seminars, ward posting, laboratory posting, field visits and self learning.

Use of Resource Materials:

Overhead projectors, slide projectors, film projectors, charts, diagrams, photographs, posters, specimens, models and other audiovisual aids shall be provided in all the Dental Colleges and attached institutions and field area. If possible, television, video and tapes showing different procedures and techniques to be mastered by the interns should be provided.

Evaluation

1. **Formative Evaluation:**

   Day-to-day assessment of the internss during their internship posting should be done.The objective ius that asll the interns must acquire necessary minimum skills required for carrying out day-to-day professional work competently. This can be achieved by maintaining records and performance data book by all internss. This will not only provide a demonstrable evidence; of the processes of training but more importantly, of the interns own acquisition of competencies as rolated to performance. It shall form a part of formative evaluation and shall also constitute a component of final grading of interns.

2. **Summative Evaluation:**

   It shall be based on the observation of the supervious of different departments and the records and performance data book maintained by the interns. Grading shall be done accordingly.

11. **Rural Services**

In the rural services, the student will have to participate in-

1. Community Health Monitoring programmes and services which include Preventive, Diagnostic and corrective procedures
2. To create educational awareness about dental hygiene and diseases.
3. Conduction of Oral Health Education Programmes at –
   (a) School Setting - 5
   (b) community Setting - 5
   (c) Adult Education Programme - 5
4. compulsory setup of satellite clinics in remote areas - 1
5. Lectures to create awareness and education in public forums about the harmful effects of tobacco consumption and the predisposition to oral cancer – two Lectures per student.

Period of Postings

1	Oral Medicine & Radiology	-	1 month
2	Oral & Maxillofacial Surgery	-	1 ½ months
3	Prosthodontics	-	1 ½ months
4	Periodontics	-	1 month
5	Conservative Dentistry	-	1 month
6	Pedodontics	-	1 month
7	Oral Pathology and Microbiology	-	15 days

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