

**SYLLABUS**  
**for Courses affiliated to the**  
**Kerala University of Health Sciences**  
Thrissur 680596



**Master of Dental Surgery (MDS)**  
**Prosthodontics and Crown & Bridge**  
**Course Code: 241**  
**(2021-2022 Academic year onwards**  
**Modified as per DCI MDS Course (3<sup>rd</sup> Amendment )**  
**Regulations 2019)**

## 2. COURSE CONTENT

### 2.1 Title of course:

MDS Prosthodontics and Crown and Bridge

### 2.2 Objectives of course

#### 1. Goals

The goals of postgraduate training in various specialities are to train the BDS graduate who will:

- Practice respective specialty efficiently and effectively, backed by scientific knowledge and skill.
- Exercise empathy and a caring attitude and maintain high ethical standards.
- Continue to evince keen interest in continuing professional education in the specialty and allied specialties irrespective of whether in teaching or practice.
- Willing to share the knowledge and skills with any learner, junior or a colleague.
- To develop the faculty for critical analysis and evaluation of various concepts and views, to adopt the most rational approach.

#### 2.Objectives

The objective is to train a candidate so as to ensure higher competence in both general and special area of interest and prepare him for a career in teaching, research and specialty practice.

A candidate must achieve a high degree of clinical proficiency in the subject matter and develop competence in research and its methodology as related to the field concerned.

The above objectives are to be achieved by the time the candidate completes the course.

The objectives may be considered as under –

- i. Knowledge (Cognitive Domain)
- ii. Skills (Psychomotor Domain)
- iii. Human values, ethical practice and communication abilities.

#### 2.i.Knowledge

- Demonstrate understanding of basic sciences relevant to the specialty.
- Describe etiology, pathophysiology, principles of diagnosis and management of common problem within the specialty in adults and children.
- Identify social, economic, environmental and emotional determinants in a given case and take them into account for planning treatment.
- Recognize conditions that may be outside the area of specialty/competence and to refer them to an appropriate specialist.
- Update knowledge by self-study and by attending courses, conferences and seminars relevant to specialty.
- Undertake audit; use information technology and carryout research both basic and clinical with the aim of publishing or presenting the work at various scientific gatherings.

#### 2.ii. Skills

- Take a proper clinical history, examine the patient, perform essential diagnostic procedures and order relevant tests and interpret them to come to a reasonable diagnosis about the condition.

- Acquire adequate skills and competence in performing various procedures as required in the specialty.

### **2.iii. Human values and ethical practice**

- Adopt ethical principles in all aspects of practice.
- Foster professional honesty and integrity.
- Deliver patient care, irrespective of social status, caste, creed, or religion of the patient.
- Develop communication skills, in particular skill to explain various options available in management and to obtain a true informed consent from the patient.
- Provide leadership and get the best out of his team in congenial working atmosphere.
- Apply high moral and ethical standards while carrying out human or animal research.
- Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed.
- Respect patient's rights and privileges including patient's right to information and right to seek a second opinion.

### **2.iv. Communicative Abilities:**

- **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.**

### **2.3 Medium of instruction:**

The medium of instruction for the course shall be English.

### **2.4 Course outline**

The syllabus for post-graduate 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.

### **2.5 Duration**

The course shall be of **three years** duration. All the candidates for the degree of MDS are required to pursue the recommended course for at least three academic years as full time candidates in an institution affiliated to and approved for Postgraduate studies by KUHS, observing the norms put forward by the DCI.

- i. There will be no reduction for the course duration for any of the students including service candidates, diploma holders and those who have done senior house surgery or equivalent research experience.

## 2.6 Syllabus

### Syllabus for MDS PROSTHODONTICS AND CROWN & BRIDGE

A strict division of the subject may not be possible and some overlapping of subjects is inevitable. Students should be prepared to answer overlapping subjects.

The concept of health care counselling shall be incorporated in all relevant areas.

### Syllabus for MDS Part I

#### 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 V<sup>th</sup> 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 myofascial 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 of Dentofacial 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.

**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 alveolar bone, 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-reduction Carbohydrates, proteins, lipids 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 antisyphilitic 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.

## **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 histopathology 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 nonparametric 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 – Coefficient 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 behaviour 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.

## **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 radiotherapy 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.

## **Syllabus for MDS Part II**

### **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, 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, Support mechanism 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 and edentulism 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 oral environment – 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 on food 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 and ridge 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 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., Maxillary sinus augmentation, block graft, ridge splitting, pterygoid implants & zygomatic 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, finalimpressions 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 and treatment 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



iatrosedative (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 and sensitivity, 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 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 of posterior 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 and processing, 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** – Science of 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
- Radiological interpretation for selection of fixtures
- Splints for guidance for 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, patient's 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 and objectives 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 master cast – paralleled blockout, shaped blockout, arbitrary blockout and relief.

**g. Diagnosis and treatment planning** –Infection control and cross infection barriers – 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 surgical preparation, 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, sequence of 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 extension removable 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 partial denture 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, adjustment of occlusion in harmony with natural and artificial dentition, instructions to the patient, follow – up services

n. **Relining and Rebasling the removable partial denture** –Relining tooth supported 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.**

## 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 bordermovements 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, patients desires 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 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 of gingivitis, 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–soft tissue 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 integrated supported and tooth supported fixed Prosthodontics

□ **CAD – CAM Prosthodontics** (including 3D Printing)

## **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, Osteoarthritis/Osteoarthritis, Hyper mobility and dislocation, infectious arthritis, inflammatory diseases, Eagle's syndrome (Styloid – stylohyoid syndrome), Synovial chondromatosis, Osteochondrosis disease, Osteonecrosis, 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, 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** –facial components, 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, bioesthetics, 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.

## 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 patients requiring 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.
- 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 –  $\frac{3}{4}$  th,  $\frac{4}{5}$ th,  $\frac{7}{8}$ th, Mesial  $\frac{1}{2}$  crowns (Preclinical)
- Pin-ledge( optional)
- Radicular crowns
- Full crowns

### 3) Tooth replacements

- |   | <b>Partial</b>  | <b>Complete</b>   |
|---|---|---|
| <input type="checkbox"/> Tooth supported            | Fixed partial denture   | Overdenture   |
| <input type="checkbox"/> Tissue supported           | Interim partial denture<br>Intermediate partial denture   | Complete denture<br>Immediate denture<br>Immediate complete denture |
| <input type="checkbox"/> Tooth and tissue Supported | Cast partial denture  | Overdenture   |
| Precision attachment                                |   |   |
| <input type="checkbox"/> Implant supported          | Cement retained Bar attachment  |   |
| Screw retained                                      | Ball attachment   |   |
| Clip attachment                                     |   |   |
| <input type="checkbox"/> Tooth and implant          |   |   |
| Supported   |   |   |
| Screw retained                                      | Screw retained  |   |
| Cement retained                                     | Cement retained   |   |
| <input type="checkbox"/> <b>Root supported</b>      | Dowel and core  | Over denture  |
| Pin retained  |   |   |
| <input type="checkbox"/> Precision attachments      | Intra coronal attachments<br>Extra coronal attachments<br>Bar – slide attachments<br>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 cast partial denture
- f. Maxillectomy 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**

- 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
  - 3/4<sup>th</sup> (canine, premolar and central)
  - 7/8<sup>th</sup> 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
- 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				5
b) Ceramics – laminates, inlays, onlays				5
c) Glass Ionomer				5
<b>CROWNS</b>				
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
<b>FIXED PARTIAL DENTURES</b>				
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

<b>CAD – CAM Anterior/Posterior FPD</b>				<b>5</b>
Interim provisional restorations (crowns and FPDs)				for all crowns and bridges
Immediate fixed partial dentures (interim) with ovate pontic				<b>5</b>
Fixed prosthesis as a retention and rehabilitation means for acquired and congenital defects – maxillofacial Prosthetics				<b>5</b>
Implant supported prosthesis				<b>1</b>
Implant – tooth supported prosthesis				<b>1</b>
<b>REMOVABLE PARTIAL DENTURE</b>				
Provisional partial denture prosthesis				<b>10</b>
Cast removable partial denture (for Kennedy's Applegate classification with modifications)				<b>3</b>
Removable bridge with precision attachments and Telescopic crowns for anterior and posterior edentulous Spaces				<b>1</b>
Immediate RPD				<b>5</b>
Partial denture for medically compromised and Handicapped patients				<b>2</b>
<b>COMPLETE DENTURES</b>				
Anatomic characterized prosthesis (by using semi adjustable articulator)	-	-	-	<b>25</b>
Single dentures	-	-	-	<b>5</b>
Overlay dentures	-	-	-	<b>5</b>
Interim complete dentures as a treatment prosthesis for abused denture supporting tissues	-	-	-	<b>5</b>
Complete denture prosthesis (for abnormal ridge relation, ridge form and ridge size)	-	-	-	<b>5</b>
Complete dentures for patients with TMJsyndromes	-	-	-	<b>2</b>
Complete dentures for medically compromised and handicapped patients	-	-	-	<b>2</b>
<b>GERIATRIC PATIENTS</b>				
Handling geriatric patients requiring nutritional counseling, psychological management and management of co-morbidity including xerostomia and systemic problems. Palliative care to elderly.				
<b>IMPLANT SUPPORTED COMPLETE PROSTHESIS</b>				
Implant supported complete prosthesis (maxillary and Mandibular)	-	-	-	<b>1</b>
<b>MAXILLOFACIAL PROSTHESIS</b>				
e.g. Guiding flange/ obturators/ Speech and palatal lift prosthesis/ Eye/ Ear/Nose/ Face/Finger/Hand/Foot	5 different types as PI			
<b>TMJ SYNDROME MANAGEMENT</b>				
Splints – periodontal, teeth, jaws	-	-	<b>1</b>	<b>1</b>
TMJ supportive and treatment prosthesis	-	-	<b>1</b>	<b>1</b>
Stabilization appliances for maxilla and mandible with freedom to move from IP to CRCP	-	-	-	<b>1</b>
In IP without the freedom to move to CRCP	-	-	-	<b>1</b>
Repositioning appliances, anterior disocclusion appliances	-	-	-	<b>1</b>
Chrome cobalt and acrylic resin stabilization appliances for modification to accommodate for the irregularities in the dentition	-	-	-	<b>1</b>

Occlusal adjustment and occlusal equilibrium appliances	-	-	1	4
<b>FULL MOUTH REHABILITATION</b>				
Full mouth rehabilitation – restoration of esthetics and function of stomatognathic system-	-	-	1	2
<b>INTER-DISCIPLINARY TREATMENT MODALITIES</b>				
Inter-disciplinary management – restoration of Oro-craniofacial defects for esthetics, phonation, mastication and psychological comforts	-	-	1	2
<b>MANAGEMENT OF FAILED RESTORATION</b>				
Tooth and tooth surface restorations	-	-	-	5
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

## 2.7 Content of each subject in each year

Present in clause 2.6

## 2.8. Total number of hours

As per the regulations of the DCI

## 2.9. Branches if any with definition

Prosthodontics and Crown & Bridge

## 2.10. Teaching learning methods

### Method of Training

The training of a postgraduate student shall be full time but graded responsibilities in themanagement and treatment of patients entrusted to his/her care. The participation of the students in all facets of educational process is essential. Every candidate should take part in seminars, group discussions, case demonstrations, clinics, journal review meetings, and clinical meetings. Every candidate shall be required to participate in the teaching and training programme of undergraduate students and interns. Training should include involvement in laboratory and experimental work, and research studies. Every Institution undertaking Post Graduate training programme shall set up an Academic cell or a Curriculum Committee, under the chairmanship of a Senior faculty member, which shall work out the details of the training programme in each speciality in consultation with other Department faculty staff and also coordinate and monitor the implementation of these training Programmes.

Based on the above guidelines for a structured training programme for postgraduate courses, the basic tenets of a successful postgraduate teaching programme, are detailed under the following heads.

- **Formal Lectures** by the faculty on varied subjects including general areas and systems. Both senior and junior faculty can do this. However, the number of these classes should be maintained of low levels to encourage self-learning.

- **Symposia / Seminars** form an integral part of PG learning. A monthly symposium will generate approximate 30-35 symposia / course. These symposia can include department faculty and HODs as chairpersons and maximum involvement of both students and faculty should be ensured.
- **Clinical Discussions** form the core of PG training and can be assigned to various clinical units on rotating basis. However other faculty could also actively participate in the discussion. The discussions must be 3-4/week. One suggestion is to score the performance of the candidate by a small panel of faculty and convey the scores to the candidate / PG at the end of the session.
- **Journal Club /Clinical Club** should be conducted at least once in a week in each postgraduate department. Journal clubs not only imparts new information but also trains the candidate to objectively assess and criticize various articles which come out and should be useful in ensuring evidence based dentistry.
- **Guest Lectures** can be integrated into the PG program at least once in a month. Even the retired faculty can be invited for delivering the lectures and will ensure importing of greater wisdom to the candidates.
- **Orientation Classes** for newcomers should also be incorporated. These classes can even be assigned to junior faculty/senior PGs.
- **Clinical posting.** Each PG student should work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases to be treated by a specialist.
- **Clinico Pathological Conferences** should be held once a year involving the faculties of Oral Medicine and Radiology, Oral Pathology and concerned clinical department. The student should be encouraged to present the clinical details, radiological and histopathological interpretations and participation in the discussions.
- **Rotation postings in other departments** should be worked out by each department in order to bring in more integration between the speciality and allied fields.
- **Periodical Quiz** can be both informative and entertaining and should be encouraged and planned.
- **Computer Training and Internet Applications** are now becoming a must for both faculty and students. These areas should be strengthened as a next step. There can be a sort of internet information club in the departments.
- **Conferences/CDEs** – All postgraduate students should be encouraged to attend conferences and CDEs. They should also be asked to present papers wherever appropriate and should be rewarded by assigning scores for them.
- **Publication of scientific papers** – It is desirable and advisable to have at least two

publications in the State/National/International indexed dental journals.

▫ **Involvement in Teaching Activity** (Developing pedagogic skills)

– PG students can be assigned the job of teaching the undergraduate students and these will definitely improve the teaching skills in the postgraduate students. Teaching by PG students should be undertaken under the supervision of concerned teachers.

## **Examinations**

Evaluation is a continuous process, which is based upon criteria developed by the concerned authorities with certain objectives to assess the performance of the learner. This also indirectly helps in the measurement of effectiveness and quality of the concerned MDS programme. Evaluation is achieved by two processes

- 1) Formative or internal assessment
- 2) Summative or university examinations.

Formative evaluation is done through a series of tests and examinations conducted periodically by the institution. Summative evaluation is done by the university through examination conducted at the end of the specified course.

A candidate registered for MDS course must clear the final examination within six years of the date of admission. The examinations should be so organized that this shall be used as the mechanism to confirm that the candidate has acquired appropriate knowledge, skill and competence at the end of the training that he/she can act as a specialist and/or a medical teacher as per expectation. University examination will be held regularly by KUHS in April-May/October-November every year.

A candidate who wishes to study for MDS in a second specialty should have to take the full course of 3 years in that specialty and appear for the examinations.

### **2.11. No: of hours per subject**

Present in clause 2.6

### **2.12. Practical training**

Present in clause 2.6

### **2.13. Records**

Present in clause 2.21

### **2.14. Dissertation: As per Dissertation Regulations of KUHS**

Every candidate pursuing MDS degree course is required to carry out work on a selected research project under the guidance of a recognized postgraduate teacher. The results of such a work shall be submitted in the form of a dissertation.

The dissertation is aimed to train a postgraduate student in research methods and techniques. It includes identification of a problem, formulation of a hypothesis, search and review of literature, getting acquainted with recent advances, designing of a research study, collection of data, critical analysis, and comparison of results and drawing conclusions.

Every candidate shall submit to the University in the prescribed format a synopsis



containing particulars of proposed dissertation work after obtaining ethical clearance from the Institutional Ethical Committee **within six months from the date of commencement of the course or before the dates notified by the University.**

The synopsis shall be sent only through the Principal of the institution.

Such synopsis will be reviewed and the dissertation topic will be registered by the university. No change in the dissertation topic or guide/co-guide shall be made without prior approval of the University. The dissertation should not be just a repetition of a previously undertaken study but it should try to explore some new aspects. The dissertation should be written under the following headings:

- Introduction
- i. Aims and Objectives of the study
- ii. Review of Literature
- iii. Methodology
- iv. Results
- v. Discussion
- vi. Conclusion
- vii. Summary
- viii. References
- ix. Annexures

The written text of dissertation shall be not less than 50 pages and shall not exceed 150 pages excluding references, tables, questionnaires, and other annexures. It should be neatly typed (font size 13-Times New Roman or font size 13-Cambria) in 1.5 line spacing on one side of the paper (A4 size, 8.27" x 11.69") and bound properly. Spiral binding should be avoided. (Refer Section V and VII). The guide, co-guide if any, Head of the Department and the Head of the Institution shall certify the dissertation.

For uniformity, it was suggested that the colour of the hard bind of the dissertation for all branches of MDS course in the purview of KUHS shall be dark brown with letters of gold colour. The title, author, and year of study should also be imprinted or embossed on the spine of the book. **Three hard copies and one properly labeled soft copy in a CD (refer Section VII) of the dissertation thus prepared shall be submitted to KUHS on the 29<sup>th</sup> month of commencement of the course / 31<sup>st</sup> Oct. of the 3<sup>rd</sup> academic year, whichever falls first.**

Dissertation should preferably be sent to a minimum of three reviewers /examiners /assessors, of which two shall be from out side the state and one from the affiliated colleges of KUHS. Consent for acceptance for evaluation of dissertation should be obtained from the reviewer/examiner/assessor before the dissertation are despatched. Proforma for evaluation of dissertation should be sent along with the copies of the dissertation to the reviewers appointed by the university. The proforma should contain all the assessment criteria with the clause – **Accepted/Accepted with modifications/Rejected** and reasons for rejection by the examiner. This proforma should be sent back to the University within two weeks / within the date specified after receipt of dissertation.

The dissertation may be declared accepted if more than 50% of the reviewers (2 in the case of 3 reviewers) have accepted it. If modifications are to be made as specified, 3 hard copies and one soft copy of the dissertation after corrections made by the candidate should be submitted within 30 days to the University which may be sent back to the same examiner/s by the University for Acceptance after a fee has been levied from the candidate. If the dissertation has been rejected by more than 50% of the reviewers (2 in

the case of 3 reviewers), the dissertation may be reviewed by an Expert Reviewing Committee comprising of not less than two subject experts, Dean (Research) of KUHS and Guide of the candidate provided the Guide requests for a review, after a fee has been levied from the candidate. If rejected by the Reviewing Committee, the candidate should take up a new topic and undergo all the procedures of submitting the synopsis, fees, IEC clearance, etc as prescribed by the University. The candidate who takes up the new topic can appear only for the subsequent examination.

**Approval of dissertation work is an essential precondition for a candidate to appear in the MDS Part II University examination.** Hall tickets for the Part II examination should be issued to the candidate only if the dissertation has been accepted.

A candidate whose dissertation has been accepted by the examiners and approved by the University, but who is declared to have failed at the final examination will be permitted to reappear at the subsequent MDS examination without having to prepare a dissertation.

**Guide** – The academic qualification and teaching experience required for recognition by the University as a guide for dissertation work is as laid down by the Dental Council of India / KUHS.

**Co-guide** – A co-guide may be included provided the work requires substantial contribution from the same department or a sister department or from another institution recognized for teaching/training by KUHS/DCI. The co-guide should fulfill the academic qualification and teaching experience required for recognition by the University as a co-guide for dissertation work.

**Change of Guide** – In the event of a registered guide leaving the college for any reason or in the event of death of guide, guide may be changed with prior permission from the University.

#### **2.15. Speciality training if any**

Present in clause 2.6

#### **2.16. Project work to be done if any**

Present in clause 2.6

#### **2.17. Any other requirements [CME, Paper Publishing etc.]**

Present in clause 2.6

#### **2.18. Prescribed/recommended textbooks for each subject**

##### **Applied Basic Sciences**

SUBJECT	NAME OF AUTHOR	NAME OF BOOK
Anatomy	BD Chaurasia	BD Chaurasia's Human Anatomy
	William, Peter L	Grays Anatomy
Oral Anatomy	Ash, Major M	Wheeler's Dental Anatomy, Physiology and Occlusion
	Sicher, Harry, Du Brull ,	Oral Anatomy

	Llyod	
Oral Histology	Bhaskar B.N. Ed	Orbans Oral Histology and Embryology
	Avery, James K	Essentials of Oral Histology and Embryology
Embryology	Sadler	Langmans Medical Embryology
	Inderbeer Singh	Human Embryology
Physiology	Guyton Arthur and John L Hall	Text Book of Medical Physiology
	Ganong, William F	Review of Medical Physiology
Pharmacology	KD Tripathi	Essentials of Medical Pharmacology
	Hardman, Joel G	Goodman and Gillmans pharmacological basis of Therapeutics
Nutrition	Nizel	Nutrition in Preventive Dentistry: Science and Practice
General Pathology	Cotran, Ramzi S and Others	Robbins Pathologic Basis of Disease
	Harsh Mohan	Textbook of Pathology
Oral Pathology	Shaffer, William and Others	Textbook of Oral Pathology
	Neville, Brad W and Others	Oral and Maxillofacial Pathology
Microbiology	Ananthanarayan and Panicker	Textbook of Microbiology
	Lakshman S	Essential Microbiology for Dentistry
Biostatistics	Dr. Symalan	Statistics in Medicine
	Soben Peter	Essentials of Preventive and Community Dentistry
	Sunder Rao and Richard J.	Introduction to Biostatistics and Research Methods

### **Dental Materials**

1. Dental Materials- Properties and manipulation- O'Brien
2. Restorative Dental Materials- Robert G. Craig
3. Notes on Dental Materials- EC Combe
4. Applied Dental Materials- McCabe
5. Philip's science of Dental Materials- Anusavice
6. Esthetics, Composite bonding technique and materials-Jorden
7. Phillips' science of Dental Materials- 2nd South Asian Edition

### **COMPLETE DENTURE**

1. Prosthodontic treatment for edentulous patients: Complete dentures and implant supported prostheses- Zarb George A. Ed and Charles L.Bolender
2. Essentials of complete denture Prosthodontics- Sheldon Winkler

3. Text book of Complete dentures- Arther O Rahn and Charles M. Heartwell
4. Swensons Complete dentures-Swenson, Merrill G.
5. Denture prosthetics: Complete dentures- Nagle and sears
6. Complete dentures Prosthodontics- John J Sharry
7. Treatment of edentulous patient- Victor O.Lucia
8. Clinical Dental prosthetics- Fenn and Lidelow
9. Dental lab procedures- Complete dentures – Morrow, Robert M and others
10. Complete denture- A clinical pathway- McEntee
11. Problems and solutions in complete denture Prosthodontics- Lamb, David J
12. A color atlas of Complete denture- John W Hobkirk
13. Color atlas and text of Complete denture-Grant
14. Clinical dental Prosthodontics- Penn NRW
15. Mastering the art of Complete denture- G Raser and R. Godd
16. Geriatric dentistry- Aging and oral health
17. Synopsis of Complete dentures- Charles W. Bartlett
18. Clinical problem solving in Prosthodontics- David W. Bartlett
19. Treatment of edentulous patients – J. Fraser, Mc Cord

### **REMOVABLE PARTIAL DENTURE**

1. Removable partial denture- Grasso and Miller
2. Mc. Crackens removable partial Prosthodontics- McGivney, Glen P, Castleberry, Dwight J
3. Clinical Removable Partial Prosthodontics- Stewart
4. Removable Denture Prosthodontics- Alan A Grant
5. Partial dentures- Terkla, Louis G, Laney, William R
6. Partial denture prosthetics – Neill D J and Walt J D
7. Partial dentures -Osborne
8. Atlas of Removable partial denture design- Stratton, Russel J, Wiebelt, Frank J
9. Dental lab procedures- Removable partial dentures- Rudd, Kenneth D and others
10. Removable denture construction- Butes, John P. and others
11. A color atlas of removable partial dentures – JD Davenport
12. Removable denture Prosthodontics- Lechner
13. Removable Partial denture- Revenue/Bochu
14. Removable Partial Prosthodontics: A case oriented manual of treatment planning- Lechner S.and Mac Gregor

### **FIXED PARTIAL DENTURE**

1. Contemporary Fixed Prosthodontics- Rosensteil, Stephen F.
2. Fundamentals of Fixed Prosthodontics- Herbert T, Shillingburg
3. Theory and practice of crown and bridge Prosthodontics- Tylman, Stanley D
4. Occlusion- Ash and Ramjford
5. Evaluation, diagnosis and treatment of occlusal problems- Dawson
6. Management of TMJ disorders and occlusion-Okesson
7. Planning and making crown and bridge- Bernad C N Smith
8. Esthetics of Anterior Fixed Prosthodontics- Chiche/Pinnualt
9. Change your smile- Goldstein
10. Text book of Occlusion- Mohl/ Zarb/ Rough
11. Ceramometal Fixed partial denture- Iracron

12. Precision fixed Prosthodontics- Clinical and laboratory aspects- Shconanbayer
13. Dental Ceramics- Mc Lean
14. Science and Art of Dental Ceramics- Vo. I , Vol. II- Mc Lean
15. Dental Lab procedures- Fixed partial dentures – Rhoads, John E and others
16. Introduction to Metal Ceramic Technology- Naylor, Patric W
17. Esthetic restoration: Improved dentist laboratory communication- Muia, Paul J and Petersburg
18. Esthetic approach to metal ceramic restoration for the mandibular anterior region- Muterthies, Klaus
19. Precision fixed Prosthodontics: Clinical and laboratory aspects- Martignoni M.
20. Aesthetic design for ceramic restoration- Korson, David
21. Modern practice in crown and bridge Prosthodontics- Johnston and Dykema
22. Modern Gnathological concept – updated- Victor O. Lucia
23. Complete mouth rehabilitation through crown and bridge Prosthodontics- Kazis H. and Kazis J
24. Occlusion and clinical practice- An evidence based approach-Klineberg and Jagger
26. Misch's Contemporary Implant Dentistry – 4 th Ed.

## **MAXILLOFACIAL PROSTHETICS**

1. Prosthetic rehabilitation- Keith F. Thomas
2. Clinical Maxillofacial prosthesis- Taylor
3. Maxillofacial Prosthodontics- Chalian
4. Maxillofacial rehabilitation- John J. Beumer

## **IMPLANT PROSTHODONTICS**

1. Contemporary Implant Dentistry - Carl E. Misch
2. Principles and practice of oral implantology- Weiss
3. Practical implant dentistry- Arun K Garg
4. Implant Prosthodontics clinical and laboratory procedures-Stevens
5. Atlas of oral implantology- Norman Cranin
6. Endosteal dental implants- McKinney
7. Implant Prosthodontics- Surgical and prosthetic procedures- Fagan
8. Implant Prosthodontics- clinical and laboratory procedures- Fagan
9. Osseointegration and occlusal rehabilitation- Hobo, Sumiya and others
10. Oral rehabilitation with implant supported prostheses- Jimenez lopez, Vicente
11. Branemarkosseointegrated implant- Albrektsson and George A Zarb
12. Clinical atlas of dental implant surgery- Michael S. block
13. Dental implants- The art and science – Charles A Babbush
14. Guided bone regeneration in implant dentistry- Buser, Daniel and others
15. Tissue- integrated prostheses: Osseointegration in clinical dentistry- Per-Ingvar Branemark and others

### **2.19. Reference books**

As suggested by HOD

### **2.20. Journals**

1. Journal of Prosthetic Dentistry.

2. British Dental Journal
3. International Journal of Prosthodontics
4. Journal of Prosthodontics
5. Journal of American Dental Association
6. Dental Clinics of North America
7. Quintessence international
8. Australian Dental Journal
9. Journal of Indian Dental Association
10. Journal of Oral Implantology
11. Journal of Indian Prosthodontic Society

## **2.21. Logbook**

### **▫ Work Diary / Log Book**

Logbooks serve as a document of the trainee's work. The trainee shall maintain this Logbook of the special procedures/operations observed/assisted/performed by him/her during the training period right from the point of entry and its authenticity shall be assessed weekly by the concerned Post Graduate Teacher / Head of the Department. This shall be made available to the Board of Examiners for their perusal at the time of his / her appearing at the Final examination. The logbook should record clinical cases seen and presented, procedures and tests performed, seminars, journal club and other presentations. Logbook entries must be qualitative and not merely quantitative, focusing on learning points and recent advances in the area and must include short review of recent literature relevant to the entry. A work diary containing all the various treatment done by the candidate in the course of the study should also be maintained. The work diary shall be scrutinized and certified by both the guide/co guide and Head of the Department and presented in the University practical/clinical examination.

## **3 EXAMINATIONS**

### **3.1 Eligibility to appear for exams**

Every candidate to become eligible to appear for the **MDS examination** shall fulfill the following requirements.

#### **a) MDS Part I Examination**

##### **Attendance**

Every candidate shall have fulfilled the attendance prescribed by the University(80%) during first academic year of the Postgraduate course.

##### **Library Dissertation**

Submission of Library Dissertation as per the regulations of KUHS is mandatory for a candidate to appear for the MDS part I examination.

## **b) MDS Part II (Final) Examination**

### **Attendance**

Every candidate should fulfill the attendance prescribed by the University during **each academic year** of the Postgraduate course. A candidate becomes eligible for writing the University examination only after the completion of 36 months from the date of commencement of the course. The candidates should have completed the training period before the commencement of examination.

### **Pass in MDS Part I Examination**

Every candidate shall have to pass the Part I examination to become eligible to appear for the Part II examination. The candidates shall have to pass the **Part-I** examination at least six months prior to the final (Part-II) examination.

### **Dissertation**

Approval of the dissertation is a mandatory requirement for a candidate to appear for the MDS Part II University examination.

### **Progress and Conduct**

Every candidate shall have participated in seminars, journal review meetings, symposia, conferences, case presentations, clinics and didactic lectures during each year as designed by the concerned department.

### **Work Diary and Logbook**

Every candidate shall maintain a work diary and logbook for recording his/her participation in the training programmes conducted by the department. The work diary and logbook shall be verified and certified by the Head of the department.

The certification of satisfactory progress by the Head of the Department and Head of the Institution shall be based on check list given in 5.1 to 5.8.

- **Students should note that in case they do not complete the exercises and work allotted to them within the period prescribed, their course requirements will be considered unfulfilled.**
- **Clinical Records, Work Diaries and Logbooks should be maintained regularly and approved by the guide, duly certified by the Head of the Department.**

### **3.2 Schedule of Regular/Supplementary exams**

The MDS Part I examination shall be held at the end of the first academic year and the MDS Part II examination at the end of the third academic year. The university shall conduct two examinations in a year at an interval of four to six months between two examinations. **Not more than two examinations shall be conducted in an academic year.**

**3.3 Scheme of examination showing maximum marks and minimum marks**The MDS examination shall consist of theory, practical / clinical examination, and Viva-voce and Pedagogy

**(i) Theory:** There shall be two theory examinations for the MDS course,

**Part I Examination** – at the end of the first academic year

**Part II Examination** –at the end of the third academic year

**Part-I Examination:** Shall consist of one theory paper

There shall be a theory examination in the Basic Sciences of three hours' duration at the end of the first academic year of the course. The question papers shall be set and evaluated by the faculty of the concerned speciality. The candidates shall have to secure a minimum of 50%marks in the Basic Sciences paper and shall have to pass the **Part-I** examination at least six months prior to the final (Part-II) examination.

**Part-II Examination:** Shall consist of

(i) Theory - three papers, namely: –Paper I, Paper II & Paper III, each of three hours' duration.

(ii) Practical and Clinical Examination;

(iii) Viva-voce and Pedagogy.

**Theory: (Total 400 Marks)**

**(1) Part I University Examination (100 Marks):-**

There shall be 10 questions of 10 marks each (Total of 100 Marks)

**(2) Part II (3 papers, each of 100 Marks):-**

(i) Paper-I: 2 long essay questions of 25 marks each and 5 short essays of 10 marks each. (Total of 100 Marks)

(ii) Paper-II: 2 long essay questions of 25 marks each and 5 short essays of 10 marks each. (Total of 100 Marks)

(iii) Paper III: 2 out of 3 essay questions (2 x 50 = 100 Marks)

**Practical and Clinical Examination: 200 Marks**

**Viva-voce and Pedagogy: 100 Marks**

**Written Examination (Theory): 400 Marks**

**Theory:**

There shall be two theory examinations for the MDS course.

Part-I: Basic Sciences Paper - **100 Marks**

The Part I examination consists of one theory paper in Basic Sciences, of three hours' duration and shall be conducted at the end of the first academic year of the MDS course.

Part II ( Final) Theory/Written examination:**300 Marks**

The Part II theory examination shall be conducted at the end of Third year of MDS course and consist of three papers, each of three hours duration.

Each paper shall carry 100 marks. The type of questions in the first two papers will be two long essay questions carrying 25 marks each and five short essay questions each carrying ten marks. There will be no options in the questions in the first 2 papers. Third paper will



be an essay question paper with three essay questions carrying 50 marks each and the candidate is to answer any two of the essays. Questions on recent advances may be asked in any or all the papers. The syllabus for the theory papers of the concerned specialty should cover the entire field of the subject.

Though the topics assigned to the different papers are generally evaluated under designated papers, 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.

The theory examinations shall be held sufficiently earlier than the practical/clinical examinations to facilitate evaluation of answer books.

The total marks for the Part II theory examination shall be 300.

### **Practical Examination: 200 Marks**

In case of practical examination, it should aim at assessing competence and skills of techniques and procedures. It should also aim at testing student's ability to make relevant and valid observations, interpretation and inference of laboratory or experimental or clinical work relating to his/her subject for undertaking independent work as a specialist. The total mark for practical/clinical examinations shall be 200.

### **Viva voce : 100 Marks**

Viva voce examination shall aim at assessing depth of knowledge, logical reasoning, confidence and oral communication skills. The candidate may be given a topic for the pedagogy in the beginning of the clinical examination and asked to make a presentation on the topic for 8-10 minutes. The total marks shall be 100 of which 80 would be for the viva voce (20 marks/examiner) and 20 marks for the pedagogy.

## **3.4 Papers in each year**

**Part I Examination** – conducted at the end of the first academic year

**Paper-I - Applied Basic Sciences:** Applied Anatomy, Nutrition & Biochemistry, Pathology & Microbiology, virology, AppliedDental anatomy & histology, Oral pathology & oral Microbiology, Adultand geriatric psychology. Applied dental materials.

**Part-II Examination** – conducted at the end of the third academic year

**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-** Essay – Descriptive and analyzing type questions

## **3.5 Details of theory exams**

Written examination shall consist of Part I, Basic Sciences, of three hours duration, conducted at the end of First year of MDS course. Part-II Examination shall be conducted at the end of Third year of MDS course and shall consist of Paper-I, Paper-II and Paper-III, each of three hours duration.

**Theory : (Total :400 Marks)**

**(1) Part I University Examination (100 Marks):-**

There shall be 10 questions of 10 marks each (Total of 100 Marks)

**(2) Part II (3 papers each of 100 Marks):-**

(i) Paper-I: 2 long essay questions of 25 marks each and 5 short essays of 10 marks each.

(Total of 100 Marks)(ii) Paper-II: 2 long essay questions of 25 marks each and 5 short essays of 10 marks each.

(Total of 100 Marks)

(iii) Paper III: 2 out of 3 essay questions (50 x 2 = 100 Marks)

Distribution of topics for each paper will be as follows:

**MDS Part I**

**Paper I : Applied Basic Sciences:** Applied Anatomy, Nutrition & Biochemistry, Pathology & Microbiology, virology, AppliedDental anatomy & histology, Oral pathology & oral Microbiology, Adultand geriatric psychology. Applied dental materials.

**MDS Part II**

**Paper I:** Complete denture & Removable Prosthodontics and Implant supported prosthesis (Implantology), Geriatric dentistry and Cranio facial Prosthodontics

**Paper II:** Fixed Prosthodontics, Occlusion, TMJ and Esthetics.

**Paper III:** Essay- Descriptive and Analyzing type questions

**3.6 Model Question Paper**

**MDS Part I Examination**

**MDS Prosthodontics and Crown and Bridge**

**Paper I: Applied Basic Sciences:** Applied Anatomy, Nutrition & Biochemistry, Pathology & Microbiology, virology, AppliedDental anatomy & histology, Oral pathology & oral Microbiology, Adultand geriatric psychology. Applied dental materials.

(Answer all questions)

Time 3 hours

Marks 100

**(10 x 10 = 100 marks)**

1. Describe the anatomy of the temporomandibular joint. Add a note on the muscles involved in the movements of TMJ.
2. Discuss the significance of nutrition in geriatric patients.
3. Discuss the recent advances in denture base materials.
4. Microscopic anatomy of maxillary denture bearing area
5. Role of saliva in Prosthodontics.
6. Healing of extraction socket.
7. Cohort study.
8. Recent advances in impression materials.
9. Chemical mediators of inflammation.
10. Disposal of hospital waste.

**MDS Part II Examination**  
**MDS Prosthodontics and Crown and Bridge**  
**Paper I : Complete denture & Removable Prosthodontics**  
**and Implant supported prosthesis (Implantology),**  
**Geriatric dentistry and Cranio facial Prosthodontics**  
(Answer all questions)

Time: 3 hours

Max marks: 100

**Long essays**

**(2 x 25 = 50 marks)**

1. Classify implant supported overdentures. Describe the biomechanical aspects and treatment planning of such overdentures.
2. Mention the various jaw relations to be registered for making a complete denture. Mention the common difficulties encountered in registering the relations. What are the methods of overcoming such difficulties?

**Short essays**

**(5 x 10 = 50 marks)**

3. Different types of block out procedures in the fabrication of a removable partial denture
4. Principles of designing direct retainer for a removable partial denture
5. Prosthodontic management of a patient requiring maxillectomy
6. Role of teeth arrangement in improving speech in complete denture wearers
7. Recent developments in dental cast surveyors

**MDS Part II Examination**  
**MDS Prosthodontics and Crown and Bridge**  
**Paper II –FIXED PARTIAL PROSTHODONTICS, OCCLUSION,**  
**TMJ AND AESTHETICS**  
(Answer all questions)

Time: 3 hrs

Max marks : 100

**Long essays**

**( 2 x 25 = 50marks)**

1. Describe the various designs and indications of gingival margin preparations of teeth for a fixed partial denture.
2. Classify splints and their role in the management of Temporomandibular disorders.

**Short essays ( 5x10=50marks)**

3. Various designs of tooth preparation for porcelain laminate veneers.
4. Principles of pontic design
5. Importance of provisional prostheses in fixed Prosthodontics
6. Biological failures in tooth supported fixed partial dentures
7. Canine protected occlusion

**MDS Part II Examination**  
**MDS Prosthodontics and Crown and Bridge**  
**Paper III – ESSAY(Descriptive and Analyzing type questions)**  
**(Answer any TWO of the following)**

Time: 3hours

Marks:100

- |  |              |
|--|--------------|
| 1. Splints used in prosthodontics.         | ( 50 marks)  |
| 2. Prosthetic options in implant dentistry | ( 50 marks ) |
| 3. CAD CAM in maxillofacial prosthetics    | (50 marks)   |

**3.7 Internal assessment component**

Not applicable.

**3.8 Details of practical/clinical exams**

The Practical / Clinical examination shall be conducted in 3 days. If there are more than 6 candidates, it shall be extended for one more day.

Each candidate shall be examined for a minimum of three days, six hours per day including viva voce. There must be four examiners out of which 50 percent of the examiners will be from other states.

The practical examination will include Complete Denture, Removable Partial Denture and Fixed Partial Denture.

**Day 1**

**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 |

**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
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**ALL STEPS WILL INCLUDE CHAIRSIDE, LAB AND VIVA VOCE**

<b>3. Fixed Partial Denture</b>	<b>35 Marks</b>
a. Case discussion including treatment planning and selection of patient for F.P.D.	5 Mark
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
<b>4. Removable Partial Denture</b>	<b>25 Marks</b>
a. Surveying and designing of partial dentate cast.	5 marks
b. Discussion on components and material selection including occlusal schemes.	10 marks
<b>5. Implant supported prosthesis (2<sup>nd</sup> stage- protocol)</b>	<b>30 marks</b>
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>B. Viva Voce :</b>	<b>100 Marks</b>
<b>I. Viva-Voce examination:</b>	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.	
<b>II. Pedagogy :</b>	20 marks

**3.9 Number of examiners needed (Internal & External) and their qualifications**

**Part I:**

The University shall appoint one internal and one external examiner of the same specialty for evaluating the Part I answer scripts. The Part I answer paper shall be evaluated by external and internal examiners of the same speciality appointed by the University adhering to the evaluators guidelines of KUHS.

**Part II:**

There shall be at least four examiners in each branch of study. Out of four, two (50%) should be external examiners and two shall be internal examiners. The qualification and teaching experience for appointment as an examiner shall be as laid down by the DCI. The external examiners shall ordinarily be invited from another recognized University from outside the state. An external examiner may ordinarily be appointed for the same institute for not more than two years consecutively. Thereafter he may be reappointed after an interval of one year. The same set of examiners shall ordinarily be responsible for the practical and viva voce of the examination.

The Head of the Department shall ordinarily be one of the examiners and the chairperson

of the Board of Examinations; second internal examiner shall rotate after every two consecutive examinations if there are more than two postgraduate teachers in the department other than the Head of the department. No person who is not an active Postgraduate teacher in that subject can be appointed as Examiner. However, in case of retired personnel, a teacher who satisfies the above conditions could be appointed as examiner up to one year after retirement.

### 3.10 Details of viva

#### Viva Voce :100 Marks

i. Viva-Voce examination : 80marks

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 = 20marks

### 4.INTERNSHIP

Not applicable for PG Courses

### 5.ANNEXURES

#### 5.1 Checklist 1

##### Model Checklist for Evaluation of Preclinical Exercises

Name of Student:

Date:

Name of the Faculty-in-charge:

Name of Exercise

Sl. No:	Items for observation during evaluation	Score
1	Quality of Exercise	
2	Ability to answer questions	
3	Punctuality in submission of exercise	
4	TOTAL SCORE	
Performance		Score
Poor		0
Below Average		1
Average		2
Good		3
Very good		4

Signature of Faculty-in-charge

## 5.2 :Checklist 2

### Model Checklist for Evaluation of Journal Review / Seminar Presentation

Name of Student:

Date:

Name of the Faculty:

Name of Journal / Seminar:

Sl. No:	Items for observation during evaluation	Score
1	Relevance of Topic	
2	Appropriate Cross references	
3	Completeness of Preparation	
4	Ability to respond to questions	
5	Effectiveness of Audio-visual aids used	
6	Time Scheduling	
7	Clarity of Presentation	
8	Overall performance	
	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty/ In Charge

## 5.3 :Checklist 3

### Model Checklist for Evaluation of Clinical Case and Clinical Work

Name of Student:

Date:

Name of the Faculty:

Sl. No:	Items for observation during evaluation	Score
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1	History	
	Elicitation	
	Completeness	
2	Examination	
	General Examination	
	Extraoral examination	
	Intraoral examination	
3	Provisional Diagnosis	
4	Investigation	
	Complete and Relevant	
	Interpretation	
5	Diagnosis	
	Ability to defend diagnosis	
6	Differential Diagnosis	
	Ability to justify differential diagnosis	
7	Treatment Plan	
	Accuracy	
	Priority order	
8	Management	
9	Overall Observation	
	Chair side manners	
	Rapport with patient	
	Maintenance of Case Record	
	Quality of Clinical Work	
	Presentation of Completed Case	
10	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty

#### 5.4 :Checklist 4

#### Model Checklist for Evaluation of Library Dissertation Work

Name of Student:

Date:

Name of the Faculty/Guide:

Sl.	Items for observation during evaluation	Score
-----	---	-------



No:		
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide	
7	Completeness of Preparation	
8	Ability to respond to questions	
9	Quality of final output	
	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty

## 5.5 :Checklist 5

### Model Checklist for Evaluation of Dissertation Work

Name of Student:

Date:

Name of the Faculty/Guide/Co-guide:

Sl.	Items for observation during evaluation	Score
-----	---	-------

No:		
1	Interest shown in selecting topic	
2	Relevance of Topic	
3	Preparation of Proforma	
4	Appropriate review	
5	Appropriate Cross references	
6	Periodic consultation with guide/co-guide	
7	Depth of analysis/Discuss	
8	Ability to respond to questions	
9	Department Presentation of findings	
10	Quality of final output	
	TOTAL SCORE	

Performance	Score
Poor	0
Below Average	1
Average	2
Good	3
Very good	4

Signature of Faculty

## 5.6 : CHECKLIST- 6

### CONTINUOUSEVALUATION OF DISSERTATION WORK BY GUIDE/CO-GUIDE

Name of the Trainee:

Date

Name of the Faculty

Sl.No.	Items for observation during presentation	Poor 0	Below Average 1	Average 2	Good 3	Very Good 4
1	Periodic consultation with guide / co- guide					
2	Regular collection of case material					
3	Depth of Analysis / Discussion					
4	Department presentation of findings					
5	Quality of final output					
6	Others					
	TOTAL SCORE					

Signature of the guide / co-guide

## 5.7 : CHECKLIST - 7

### OVERALL ASSESSMENT SHEET

Name of the College:

Date:

Name of Department:

Check List No	PARTICULARS	Name of trainee		
		First Year	Second Year	Third Year
1	Preclinical Exercises			
2	Journal Review Presentation			
3	Seminars			
4	Library dissertation			
5	Clinical work			
6	Clinical presentation			
7	Teaching skill practice			
8	Dissertation			

	TOTAL			
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**Signature of HOD**

**Signature of Principal**

The above overall assessment sheet used along with the logbook should form the basis for certifying satisfactory completion of course of study, in addition to the attendance requirement.

**Key:**

**Mean score:** Is the sum of all the scores of checklists 1 to 6

5.8 : LOG BOOK

**DEPARTMENT OF .....**

**MDS Programme**

**LOG BOOK OF**

**NAME.....**

**BIODATA OF THE CANDIDATE**

**EXPERIENCE BEFORE JOINING P.G. COURSE**

**DETAILS OF POSTING :**

- FIRST YEAR
- SECOND YEAR
- THIRD YEAR

**DETAILS OF LEAVE AVAILED**







**Key:**

O- WASHED UP AND OBSERVED - INITIAL 6 MONTHS OF ADMISSION

A - ASSISTED A MORE SENIOR SURGEON -1 YEAR MDS

PA - PERFORMED PROCEDURE UNDER THE DIRECT SUPERVISION OF A SENIOR SURGEON - II YEAR MDS

PI - PERFORMED INDEPENDENTLY - III YEAR MDS

Signature of the guide / co-guide

**Annexure : 5.9****Faculty**

a. In each department there should be a minimum required full time faculty members belonging to the disciplines concerned with requisite postgraduate qualification and experience for being a PG teacher as prescribed by the DCI. The requirements of the faculty should follow the norms framed by the DCI.

b. To strengthen and maintain the standards of postgraduate training, DCI and KUHS recommends the following minimum faculty requirements (Table 1) for starting and continuation of postgraduate training programmes. Any increase of admissions will also be based on the same pattern.

**Table 1: Minimum Faculty Requirements****Unit 1**

1. Minimum faculty requirement of 1<sup>st</sup> Unit in an undergraduate institute having basic infrastructure of 50 admissions

Department / Speciality	Professor (HOD)	Readers/ Associate Professors	Lecturers/Assistant Professor
Prosthodontics and Crown & Bridge	1	3	4



Conservative Dentistry and Endodontics	1	3	4
Periodontology	1	2	2
Orthodontics & Dentofacial Orthopedics	1	2	2
Oral & Maxillofacial Surgery	1	2	2
Oral & Maxillofacial Pathology and Oral Microbiology	1	2	2
Oral Medicine & Radiology	1	2	2
Pediatric Dentistry	1	2	2
Public Health Dentistry	1	2	2

2 .Minimum faculty requirement of 1<sup>st</sup> Unit in an undergraduate institute having basic infrastructure of 100 admissions

Department / Speciality	Professor (HOD)	Readers/ Associate Professors	Lecturers/Assistant Professor
Prosthodontics and Crown & Bridge	1	3	6
Conservative Dentistry and Endodontics	1	3	6
Periodontology	1	3	3
Orthodontics & Dentofacial Orthopedics	1	2	3
Oral & Maxillofacial Surgery	1	3	3
Oral & Maxillofacial Pathology and Oral Microbiology	1	2	3
Oral Medicine & Radiology	1	2	3
Pediatric Dentistry	1	2	3
Public Health Dentistry	1	2	3

### 3. Unit 2 :-

Each department shall have the following additional teaching faculty, over and above the requirement of Unit 1.

Professor	1
Reader /Associate Professor	1
Lecturer / Assistant Professor	2

a. In addition to the faculty staff mentioned above there should be adequate strength of Senior Lecturers/ Lecturers available in the department. The department should also have adequate number of technical and other paramedical staff as prescribed by the Dental Council of India.

b. A department which does not have a Professor and an Assistant Professor with requisite qualifications and experience as laid down by the DCI, shall not start a postgraduate course in that specialty.

c. Faculty who is accepted as Postgraduate teacher in a dental institute starting MDS course will not be accepted for the next one year in any other dental institute.

### Clinical / Laboratory Facilities and Equipments

There should be adequate clinical material, space and sufficient number of dental chairs and units, adequate laboratory facilities and should regularly be updated keeping in view the advancement of knowledge and technology and research requirements. The department

should have the minimum number of all equipments including the latest ones necessary for the training and as recommended by the DCI/KUHS for each specialty from time to time.