Program outcome, Program specific outcome and course outcome in bachelor of dental surgery program

COURSE	SUBJECT	COURSE OUTCOME
First bds	*Anatomical science*	a. KNOWLEDGE AND UNDERSTANDING: At the end of the first BDS in anatomical science the undergraduate student is expected to i.Know the normal disposition of the structures in the body while clinically examining a Patient and while conducting the clinical procedures ii. Know the anatomical basis of disease and injury iii. Know the microscopic structure of the various tissues, a prerequisite for understanding the disease process. iv. Know the nervous system to locate the site of lesion according to the sensory and or the motor deficits encountered v. Have an idea about the basis of the abnormal development, critical stages of development, effects of teratogens, genetic mutations and environmental hazards vi. Know the sectional anatomy of the head and neck and brain to read the features in the Radiographs and the picture taken by modern technique vii. Know the anatomy of cardiopulmonary resuscitation b. SKILLS: i.To locate various structure of the body and to mark the topography of the living anatomy ii. To identify various tissues under microscope iii. To identify the features in radiography and modern imaging techniques. iv. To detect various congenital abnormalities. c. ATTITUDE: i.Willingness to apply the current knowledge of dentistry in the best interest of the patient and community ii. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community

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First BDS	***Physiology***	a. KNOWLEDGE AND UNDERSTANDING: At the end of the course, the student will be able to: i.Explain the normal functioning of all the organ systems and their interactions for well co-ordinated total body function. ii. Assess the relative contribution of each organ system towards the maintenance of the milieu interior. iii. List the physiological principles underlying the pathogenesis and treatment of disease b. SKILLS: At the end of the course, the student shall be able to : i.Conduct experiments designed for the study of physiological phenomena. ii. Interpret experimental and investigative data iii. Distinguish between' normal and abnormal data derived as a result of tests which he/she has performed and observed in the laboratory. c. ATTITUDE: To develop the attitude to serve the rural community. d. INTEGRATION: At the end of the integrated teaching the student shall acquire an integrated knowledge of organ structure and function and its regulatory mechanisms.
First BDS	***Biochemistry***	a.KNOWLEDGE AND UNDERSTANDING At the end of the course, the student should be able to: i.describe the molecular and functional organization of a cell and list its subcellular components ii. delineate structure, function and inter-relationships of biomolecules and consequences of deviation from normal iii. summarize the fundamental aspects of enzymology and clinical application wherein regulation of enzymatic activity is altered iv. describe digestion and assimilation of nutrients and consequences of malnutrition v. integrate the various aspects of metabolism and their regulatory pathways

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		vi. explain the biochemical basis of inherited disorders with their associated sequelae vii. describe mechanisms involved in maintenance of body fluid and pH homeostasis viii. outline the molecular mechanisms of gene expression and regulation, the principles of genetic engineering and their application in dentistry ix. summarize the molecular concepts of body defence and their application in dentistry x. outline the biochemical basis of environmental health hazards, biochemical basis of cancer and carcinogenesis xi. explain the principles of various conventional and specialized laboratory investigations and instrumentation analysis and interpretation of a given data relevant to dentistry xii. suggest experiments to support theoretical concepts and clinical diagnosis. b.SKILLS: At the end of the course, the student should be able to : 1.make use of conventional techniques/instruments to perform biochemical analysis relevant to clinical screening and diagnosis 2.analyze and interpret investigative data 3. demonstrate the skills of solving scientific and clinical problems and decision making in dentistry c.ATTITUDE: At the end of the course, the student should be able to understand the biochemical basis of the health and diseases. d. INTEGRATION: The knowledge acquired in biochemistry should help the students to integrate molecular events with structure and function of the human body
First year BDS	***Dental Anatomy, Embryology, and Oral Histology***	a.KNOWLEDGE AND UNDERSTANDING: 1. To acquire an understanding of how cells, tissues, and organs develop and function in order to gain a clear perspective of these structures as a basis for understanding oral biology/ecology 2. To develop a comprehension of the principles of embryogenesis and human development with emphasis on the face and structures of the oral cavity 3. To understand, comprehend, describe, compare, and illustrate the histologic characteristics of oral tissues in health and diseased states

4. To develop a professional vocabulary of terminology related to the head and neck, the oral complex, and the teeth so as to apply in clinical scenario

5. To identify, locate, and relate the gross anatomical structures of the head and neck to include various teeth, the bones of the skull, musculature, major nerves, glands and the circulatory and lymphatic systems.

6. To identify the histologic and anatomic features of the extra-oral and intraoral structures.

7. To compare and contrast the human dentition in relationship to location, function, and morphology

8. To identify, comprehend, describe the sequence and eruption patterns of primary and permanent teeth and their implications on future oral and overall health

9. To understand the oral physiology, unique biochemical basis behind of oral musculature, glands and movements

10. To be able to clinically apply and incorporate knowledge of tooth morphology, dental occlusion, head and neck anatomy, histology, and embryology into patient assessment, preventive management, treatment planning, and patient education in future

b.SKILLS:

1. Able to carve and reproduce the morphology of human permanent teeth in wax blocks

2. Able to identify different oral hard tissues in clinical situations

3. Able to differentiate normal from abnormal and diseased states

4. Able to identify various types of human teeth based on their morphology

5. Able to appreciate the influence of age, gender and race on oral and para-oral structures

6. Able to locate the different areas/surfaces of the teeth

7. Able to understand the implications of the disease process and ageing on normal oral structures

8. Able to appreciate the eruption and shedding pattern of human teeth

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		9. Able to appreciate and integrate the concept of occlusion, range of human jaw movements in preclinical and clinical situations 10. Able to use effectively the terminologies and anatomical terms for clinical and patient communications Competencies specific to the subject :- i.To gain knowledge about the microscopic configuration of normal histological structure of both soft and hard tissues.
Second year BDS	***General Pathology***	a. KNOWLEDGE AND UNDERSTANDING: • To demonstrate and analyze pathological changes at macroscopic and microscopic levels and explain their observations in terms of disease processes. • To integrate knowledge from the basic sciences, clinical medicine and dentistry in the study of Pathology. • To demonstrate understanding of the capabilities and limitations of morphological pathology in its contribution to medicine, dentistry and biological research. • To demonstrate ability to consult resource materials outside lectures, laboratory and tutorial classes. b. SKILLS: • A dental graduate should be able to identify the abnormal diseases like tumor, non tumours and also to arrive what are the investigations needed for the diagnosis of the diseases. • Carry out certain investigations and ability to interpret lab findings. c. ATTITUDE: • A dental student must be willing to apply the knowledge gained in pathology in the best interest of the patient and the community. • Maintain a high standard of professional ethics In patient care and also in carrying out the diagnostic modalities. • Willing to update knowledge in pathological conditions and diagnostic investigations from time to time. d.INTEGRATION :- The dental student must be able to integrate the pathological aspects with the diseases so that it helps to understand the disease nature and management of the disease.
Second year BDS	***Microbiology***	a. KNOWLEDGE AND UNDERSTANDING: i. At the end of the Microbiology course the student is expected to Understand the basics of various branches of Microbiology and able to apply the knowledge relevantly.

		ii. Apply the knowledge gained in related medical subjects like General Medicine and General Surgery and Dental subjects like Oral Pathology, Community Dentistry, Periodontics, Oral Surgery, Pedodontics, Conservative Dentistry and Oral Medicine in higher classes. iii. Understand and practice various methods of Sterilisation and disinfection in dental clinics. iv. Have a sound understanding of various infectious diseases and lesions in the oral cavity. v. Awareness of Health care associated infections and their prevention in dental practice b.SKILLS i.Student should have acquired the skill to diagnose, differentiate various oral lesions. ii. Should be able to select, collect and transport clinical specimens to the laboratory. iii. Should be able to carry out proper aseptic procedures in the dental clinic. iv. Interpretation of antimicrobial susceptibility tests and to make right choice of antibiotic based on spectrum of infection and ensure appropriate use to avoid antibiotic resistance. c. ATTITUDE: i.To apply knowledge in the interest of the individual patient and community. ii. Maintain high standards of professional ethics in patient care and in carrying out diagnostic tests. iii. To update knowledge from time to time with regard to diagnostics and immunoprophylaxis. d.INTEGRATION: At the end of integrated teaching the student shall acquire integrated knowledge from different disciplines which includes etiology,morphology,pathogenesis, clinical features,laboratory diagnosis,treatment,prevention and control of infectious disease

Second year BDS	***General Pharmacology***	a)KNOWLEDGE AND UNDERSTANDING: At the end of the course the student shall be able to i.Describe the pharmacokinetics and pharmacodynamics of essential and commonly used drugs in general and in dentistry in particular. ii. List the indications, contraindications, interactions and adverse reactions of commonly used drugs with reason. iii. Tailor the use of appropriate drugs in disease with consideration to its cost, efficacy, safety for individual and mass therapy needs. iv. Indicate special care in prescribing common and essential drugs in special medical situations such as pregnancy, lactation, old age, renal, hepatic damage and immunocompromised patients. v. Integrate the rational drug therapy in clinical pharmacology. vi. Indicate the principles underlying the concepts of "Essential drugs". b) SKILLS: At the end of the course student shall be able to: i.Prescribe drugs for common medical and dental ailments. ii. Appreciate adverse reactions and drug interactions of commonly used drugs iii. Observe experiments designed for study of effects of drugs. iv. Critically evaluate drug formulations and be able to interpret the clinical pharmacology of marketed preparations commonly used in dentistry c) ATTITUDE: To develop the attitude to serve the rural community d) INTEGRATION: Practical knowledge of use of drugs in clinical practice will be acquired through integrated teaching with clinical departments

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Second year BDS	***Dental Materials***	a. KNOWLEDGE AND UNDERSTANDING: The graduate should acquire the following during the period of training --- Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions and should be able to evaluate and analyse scientifically various established facts and data. To understand the evolution and development of science of dental materials. To know about the manipulation technique of various restorative materials. b. SKILLS: A graduate should be able to demonstrate the following skills necessary for practice of dentistry. To develop skills in the management of various materials in dentistry. Students should know about the physical and chemical properties of the dental materials c. ATTITUDE: A graduate should develop during the training period the following attitudes. Willing to apply current knowledge of dentistry in the best interest of the patients and the community. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community. Willingness to participate in the continuing education programmes to update knowledge and professional skills from time to time. To help and to participate in the implementation of National Health Programmes.
Second year BDS	***Preclinical conservative dentistry***	a. KNOWLEDGE AND UNDERSTANDING: The student should acquire adequate knowledge during this period of training. Knowledge of the scientific foundation of conservative dentistry and understanding of various treatment procedures carried out in conservative dentistry with emphasize on biological principal to be followed during these treatment procedures and to acquire knowledge of various instruments and materials used in restorative procedures .They should also be aware of various manipulative techniques of restorative material. b. SKILLS: The students should be able to demonstrate the following skills which are necessary for practice in conservative dentistry To develop skills in manipulation of various materials used in conservative dentistry. To develop skills in

		preparation of various cavities and to perform various restorative procedures. c. ATTITUDE: The student should be able to apply the current knowledge of various materials used in dentistry in the interest of patients and the community in general. To be aware of recent developments in instruments and materials used in conservative dentistry and update his/her knowledge by attaining various continuing education programmes. Should be aware of both benefits and health hazards of various restorative materials used in conservative dentistry. Should maintain high standard of professional ethics and apply those in all aspects of professional life. d. INTEGRATION: The dental student must be able to identify the healthy and diseased state of the teeth, thereby enabling them to better understand the diseased state and to plan an ideal treatment protocol for the same
Second year BDS	***Pre clinical Prosthodontics & Crown & Bridge***	a. KNOWLEDGE: i) Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions, ability to evaluate and analyse scientifically various established facts and deals. ii)Adequate knowledge of the development, structure and function of the teeth, mouth and jaws and associated tissues both in health and disease and their relationship and effect on general state of health and also bearing on physical and social well being of the patient. iii)Adequate knowledge of clinical disciplines and methods which provide a coherent picture of anomalies, lesions and diseases of the teeth, mouth and jaws and preventive diagnostic and therapeutic aspects of dentistry. iv)Adequate clinical experience required for the general dental practice. v)Adequate knowledge of the constitution, biological functions and behaviour of persons in health and sickness as well as the influence of the natural and social environment on the state of health in so far as it affect dentistry.

		b. ATTITUDE: A graduate should develop during the training period the following attitudes . i. Willingness to apply the current knowledge of dentistry in the best interest of the patient and community. ii. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life. iii. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community. iv. Willingness to participate in the CPED programmes to update knowledge and professional skill time to time. v. Help and participate in the implementation of the national oral health policy. c. SKILLS : A graduate should be able to demonstrate the following skills necessary fro practice in dentistry . i. Diagnose and mange various common dental problems encountered in general dental practice keeping in mind the expectations and the right of the society to receive the best possible treatment available wherever possible. ii. Prevent and manage complications if encountered while carrying out various surgical and other procedures. iii. Carry out certain investigative procedures and ability to interpret laboratory findings. iv. Promote oral health and help prevent oral disease where possible. v. Control pain and anxiety among the patients during dental treatment. d. INTEGRATION: Integrated knowledge about all the divisions in Prosthodontics (CD,RPD,FPD,IMPLANTS etc)

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Third Year BDS	***General Medicine***	a.KNOWLEDGE AND UNDERSTANDING: At the end of the course the student shall be able to: i.Describe the etiology, pathogenesis, clinical signs and symptoms and complications of various disease processes ii. Know of the various pre-requisite settings for the various diseases to occur including a knowledge of the various co-morbidities especially lifestyle diseases such as Hypertension, Diabetes Mellitus. iii. Awareness of the oral manifestations of various systemic disorders iv. Knowledge of the medical conditions requiring screening and evaluation prior to dental procedures v. To be aware of BLS steps in cases of medical emergencies while undergoing dental procedures b. SKILLS: At the end of the course the student shall be able to: i.Take a proper history from the patient ii.Do a complete general physical examination including build and nourishment iii. Assess the vitals-recording the details of Pulse, recording the BP, temperature, checking capillary blood glucose and oxygen saturation iv. Look for cyanosis, clubbing, pallor, icterus, pedal edema, lymphadenopathy, rashes, ecchymosis v. Able to examine the CVS, RS, abdomen and the facial nerve vi. Interpret the elicited signs and symptoms of various systemic disease processes vii. Interpreting lab reports such as importance of CBC, RFT, ECG, BT, CT, PT, INR etc viii. To be trained in simple procedures such as giving intramuscular, intravenous Injection as well as staring an IV line ix. To be trained in basic life support x. Writing prescriptions c. ATTITUDE: i. Willingness to apply the current knowledge of dentistry in the best interest of the patient and community

		ii. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community d.INTEGRATION: From the integrated teaching of other clinical sciences, the student shall be able to describe the various signs and symptoms and interpret the clinical manifestation of disease processes. Horizontal integration can be done in common with basic science departments, and vertical integration can be done with clinical departments. For example, horizontal integration can be the interpretation of lab results with Biochemistry and biopsy reports with Pathology; and vertical integration can be the study of oropharyngeal pathology of along with ENT and oral surgical procedures with General surgery
Third Year BDS	***General Surgery***	a. KNOWLEDGE AND UNDERSTANDING : At the end of the third BDS in General surgery the undergraduate student is expected to 1. Know the surgical anatomy , physiology and pathological basis of diseases of head and neck 2. Know the basic surgical principles 3. Know the common surgical conditions of Head & Neck 4. Know eliciting History and to do Clinical examination and to arrive at a Provisional diagnosis 5. Know about Radiological and blood investigations to arrive at a diagnosis b. SKILLS: 1. Know the interpretation of Radiological films of Head and Neck 2. Know the Operative procedures, Post operative complications and Post operative management 3. To differentiate between Benign and Malignant diseases of Head & Neck 4. Know to perform minor surgical procedures such as Draining an Abscess and taking a Biopsy c. ATTITUDE : 1. Willingness to apply the current knowledge of dentistry in the best interest of the patient and community

		2. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community d. INTEGRATION : By emphasizing on the relevant information and sound knowledge of Basic Science, to acquaint the student with various diseases, which may require surgical expertise and to train the student to analyse the history and be able to do a thorough clinical examination of the patient. This insight is gained in a variety of ways: 1. Lectures and small group teachings 2. Clinical Demonstrations 3. Observing Surgical procedures in theatres 4. Charts and models for Common surgical conditions
Third Year BDS	***Oral Pathology and Oral Microbiology***	a. KNOWLEDGE AND UNDERSTANDING: 1. Adequate knowledge of the scientific foundations' on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions; ability to evaluate and analyse' scientifically various established facts and data. 2. Adequate knowledge of the development, structure and function of the teeth, mouth and jaws and associated tissues both in health and disease and their relationship and effect on general state of health and also bearing On physical and Social well-being of the patient. 3. Adequate knowledge of clinical disciplines and methods which provide a coherent picture of anomalies, lesions and diseases of the teeth, mouth and jaws and preventive diagnostic and therapeutic aspects of dentistry. 4. Adequate clinical experience required for general dental practice 5. Adequate knowledge of the constitution, biological function and behavior of persons in health and sickness as well as the influence of the natural and social environment on the state of health in so far as it affect dentistry. d. SKILLS: A graduate should be able to demonstrate the following skills necessary for practice of dentistry 1. Diagnose and manage various common dental problems encountered in general dental practice keeping in mind the expectations and

		the right of the society to receive the best possible treatment available wherever possible. 2. Prevent and manage complications if encountered while carrying out various surgical and other procedures. 3. Carry out certain investigative procedures and ability to interpret laboratory findings. 4. Promote oral health and help prevent oral diseases where possible. 5. Control pain and anxiety among the patients during dental treatment. e. <u>ATTITUDE:</u> 1. Willingness to apply the current knowledge of dentistry in the best interest of the patient and community. 2. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life. 3. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community. 4. Willingness to participate in the CPED Programmes to update knowledge and professional skill from time to time. 5. Help and participate in the implementation of the national oral health policy. f. <u>INTEGRATION:</u> The knowledge gained from learning core basic and clinical science in medicine and dentistry are applied in the context of Oral Pathology for the following purpose:- 1. To understand the process of disease mechanism and consequential outcome. 2. To interpret radiological and/or laboratory features to make reliable pathological diagnosis, and thereby, to manage human health and disease. 3. In addition by integration of sound basic knowledge into clinical practice will enable students to develop and advance their skills for the betterment of patient care by applying scientific method either for critical appraisal of evidence based medicine or to pursue independent research relevant to medical/dental practice.

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Fourth Year BDS	***Oral Medicine and Radiology***	a. KNOWLEDGE AND UNDERSTANDING : i. Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions and should be able to evaluate and analyse scientifically various established facts and data. ii. Adequate knowledge of the development, structure and function of the teeth, mouth and jaws and associated tissues both in health and disease and their relationship and effect on general-state of health and also the bearing on physical and social well-being of the patient. iii. Adequate knowledge of clinical disciplines and methods, which provide a coherent picture of anomalies, lesions and diseases of the teeth, mouth and jaws and preventive, diagnostic and therapeutic aspects of dentistry. iv. Adequate clinical experience required for general dental practice v. Adequate knowledge of biological function and behaviour of persons in health and sickness as well as the influence of the natural and social environment on the state of health so far as it affects dentistry. b. SKILLS : i. Able to diagnose and manage various common dental problems encountered in general dental practice, keeping in mind the expectations and the right of the society to receive the best possible treatment available wherever possible. ii. Acquire skill to prevent and manage complications if encountered while carrying out various dental surgical and other procedures. iii. Possess skill to carry out required investigative procedures including clinical and radiological investigations and ability to interpret laboratory findings. iv. Promote oral health and help to prevent oral diseases wherever possible. v. Accurate planning of treatment vi. Competent in control of pain and anxiety during dental treatment. c.ATTITUDE:

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		A graduate should develop during the training period the following attitudes. i.Willing to apply current knowledge of dentistry in the best interest of the patients and the community. ii. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life. iii. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community. iv. Willingness to participate in the continuing education programmes to update knowledge and professional skills from time to time. v. To help and to participate in the implementation of national health programmes. d. INTEGRATION: From the integrated teaching, the student shall be able to describe the various signs and symptoms and interpret the clinical manifestation of disease processes. Horizontal integration can be done in common with basic science departments, and vertical integration can be done with clinical departments.
Fourth Year BDS	***Pedodontics and Preventive Dentistry***	a. KNOWLEDGE AND UNDERSTANDING: 1. Adequate knowledge of the scientific foundations' on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions; ability to evaluate and analyze scientifically various established facts and data. 2. Adequate knowledge of the development, structure and function of the teeth, mouth and Jaws and associated tissues both in health and disease and their relationship and effect on general state of health and also bearing on physical and social well being of the patient. 3. Adequate knowledge of clinical disciplines and methods which provide a coherent picture of anomalies, lesions and diseases of the teeth, mouth and jaws and preventive diagnostic and therapeutic aspects of dentistry. 4. Adequate clinical experience required for general dental practice 5. Adequate knowledge of the constitution, biological function and behaviour of persons in health and sickness as well as

		the influence of the natural and social environment on the state of health in so far as it affect dentistry. b. SKILLS: A graduate should be able to demonstrate the following skills necessary for practice of dentistry. 1. Diagnose and manage various common dental problems encountered in general dental practice keeping in mind the expectations and the right of' the society to receive the best possible treatment available wherever possible. 2. Prevent and manage complications if encountered while carrying out various surgical and other procedures. 3. Carry out certain investigative procedures and ability to interpret laboratory findings. 4. Promote oral health and help prevent oral diseases where possible. 5. Control pain and anxiety among the patients during dental treatment. c. ATTITUDE: A graduate should develop during the training period the following attitudes. 1. Willingness to apply the current knowledge of dentistry in the best interest of the patient and community. 2. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life. 3. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community. 4. Willingness to participate in the CPED Programmes to update knowledge and professional skill from time to time. 5. Help and participate in the implementation of the national oral health policy d. INTEGRATION: A graduate should have good knowledge and should be able to apply the different concepts and manage the patient as a whole.

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Fourth Year BDS	***Orthodontics and Dentofacial Orthopaedics***	a. KNOWLEDGE: (i) Demonstrate understanding of basic sciences relevant to speciality; (ii) Describe aetiology, pathophysiology, principles of diagnosis and management of common problems within the speciality in adults and children; (iii) Identify social, economic, environmental and emotional determinants in a given case and take them into account for planned treatment; (iv) Recognise conditions that may be outside the area of speciality or competence and to refer them to the concerned specialist; (v) Knowledge by self study and by attending courses, conferences and seminars pertaining to speciality; (vi) Undertake audit, use information technology and carry out research in both basic and clinical with the aim of publishing or presenting the work at various scientific gathering. b. SKILLS: I. 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; II. acquire adequate skills and competence in performing various procedures as required in the speciality. c.ATTITUDE: HUMAN VALUES, ETHICAL PRACTICE AND COMMUNICATION ABILITIES. i.adopt ethical principles in all aspects of practice; II. foster professional honesty and integrity; III. deliver patient care irrespective of social status, caste, creed, or religion of the patient; IV. develop communication skills, to explain various options available and obtain a true informed consent from the patient; V. provide leadership and get the best out of his team in a congenial working atmosphere; VI. apply high moral and ethical standards while carrying out human or animal research; VII. be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues

		when needed; VIII. respect patient's rights and privileges including patient's right to information and right to seek a second opinion c.INTEGRATION: Students should have a holistic understanding of each of the pathological situation and be able to frame a comprehensive treatment plan and deliver treatment to the limitations of what she/ he is trained and efficient and at the same time refer to the concerned specialists thereafter for opinion / further management .
Fourth Year BDS	***Periodontology***	a.KNOWLEDGE AND UNDERSTANDING: To have adequate knowledge and understanding of the basic periodontal tissues, etiology, pathophysiology, diagnosis and treatment planning for various periodontal disease/ problem. b.SKILL: To chart a proper clinical history after thorough examination of the patient, able to perform diagnostic procedure; able to interpret laboratory investigation; arrive at a provisional / definitive diagnosis regarding the periodontal problem in question. c.ATTITUDE: To develop the right attitude to store his knowledge and the willingness to learn newer concept so as to keep pace with current technology and development; also to seek opinion from an allied Medical Dental specialist as and when required. d.INTEGRATION: From the integrated teaching of other clinical sciences, the students shall be able to describe the various signs, and symptoms and interpret the clinical manifestations of disease processes.
Fourth Year BDS	***Prosthodontics and Crown and Bridge***	a. KNOWLEDGE: 1) Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions, ability to evaluate and analyze scientifically various established facts and deals. 2) Adequate knowledge of the development, structure and function of the teeth, mouth and jaws and associated tissues both in health and disease and their relationship and effect on general state of health and also bearing on physical and social well being of the patient.

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		3) Adequate knowledge of clinical disciplines and methods which provide a coherent picture of anomalies, lesions and diseases of the teeth, mouth and jaws and preventive diagnostic and therapeutic aspects of dentistry. 4) Adequate clinical experience required for the general dental practice. 5) Adequate knowledge of the constitution, biological functions and behavior of persons in health and sickness as well as the influence of the natural and social environment on the state of health in so far as it affects dentistry. b. ATTITUDE: During the training period, a graduate should develop the following attitudes. 1. Willingness to apply the current knowledge of dentistry in the best interest of the patient and community. 2. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life. 3. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community. 4. Willingness to participate in the CPED programmes to update knowledge and professional skill time to time. 5. Help and participate in the implementation of the National Oral Health Policy. c. SKILLS: A graduate should be able to demonstrate the following skills necessary for practice in dentistry. 1. Diagnose and mange various common dental problems encountered in general dental practice keeping in mind the expectations and the right of the society to receive the best possible treatment available wherever possible. 2. Prevent and manage complications if encountered while carrying out various surgical and other procedures. 3. Carry out certain investigative procedures and ability to interpret laboratory findings. 4. Promote oral health and help prevent oral disease where possible.

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		5. Control pain and anxiety among the patients during dental treatment. d. INTEGRATION: Integrated knowledge about all the divisions in Prosthodontics(CD,RPD,FPD,IMPLANTS etc)
Fourth Year BDS	***Conservative Dentistry and Endodontics***	a. KNOWLEDGE AND UNDERSTANDING: The graduate should acquire the following during the period of training. 1. Adequate knowledge and understanding of Etiology, Diagnosis and Treatment procedures. 2. Adequate knowledge of the scientific foundations on which dentistry is based and good understanding of various relevant scientific methods, principles of biological functions and should be able to evaluate and analyze scientifically various established facts and data. 3. Adequate knowledge of the development, structure and function of the teeth, mouth and jaws and associated tissues both in health and disease and their relationship and effect on general-state of health and also the bearing on physical and social well-being of the patient. 4. Adequate knowledge of clinical disciplines and methods, which provide a coherent picture of anomalies, lesions and diseases of the teeth, mouth and jaws and preventive, diagnostic and therapeutic aspects of dentistry. 5. Adequate clinical experience required for general dental practice. 6. Adequate knowledge of biological function and behavior of persons in health and sickness as well as the influence of the natural and social environment on the state of health so far as it affects dentistry. b. SKILLS: A graduate should be able to demonstrate the following skills necessary for practice of dentistry. 1. Able to diagnose and manage various common dental problems encountered in general dental practice, keeping in mind the expectations and the right of the society to receive the best possible treatment available wherever possible. 2. Acquire skill to prevent and manage complications if encountered while carrying out various dental surgical and other procedures.

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		3. Possess skill to carry out required investigative procedures and ability to interpret laboratory findings. 4. Promote oral health and help to prevent oral diseases wherever possible. 5. Competent in control of pain and anxiety during dental treatment. c. ATTITUDE: A graduate should develop during the training period the following attitudes. 1. Have empathy for the patient and do the best possible as situation demands 2. Willing to apply current knowledge of dentistry in the best interest of the patients and the community. 3. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life. 4. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community. 5. Willingness to participate in the continuing education programmes to update knowledge and professional skills from time to time. 6. To help and to participate in the implementation of national health programmes. d. INTEGRATION: 1. At the conclusion of the course the student should be able to diagnose and treat the disease efficiently. 2. Should integrate interdisciplinary approach and management
Fourth Year BDS	***Oral and Maxillofacial Surgery***	a. KNOWLEDGE AND UNDERSTANDING: At the end of the course and clinical training the graduate is expected to – 1. Apply the knowledge gained in the related medical subjects like pathology, Microbiology and general medicine in the management of patients with oral surgical problems 2. Diagnose, manage and treat (understand the principles of treatment) patients with oral surgical problems. 3. Gain Knowledge of a range of surgical treatments.

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		4. Be able to decide the requirement of a patient to have oral surgical specialist opinion or treatment. 5. Understand the principles of in-patient management. 6. Understand the management of major oral surgical procedures and principles involved in patient management. 7. Know the ethical issues and have communication ability. b. <u>SKILLS:</u> 1. A graduate should have acquired the skill to examine any patient with an oral surgical problem in an orderly manner, be able to understand requisition of various clinical and laboratory investigations and is capable of formulating differential diagnosis. 2. Should be competent in the extraction of teeth under both local and general anaesthesia. 3. Should be able to carry out certain minor oral surgical procedures under LA like frenectomy, alveolar procedures & biopsy etc. 4. Ability to assess, prevent and manage various complications during and after surgery. 5. Able to provide/primary care and manage medical emergencies in the dental office. 6. Understand the management of major oral surgical problems and principles involved, in inpatient management. c. <u>ATTITUDE:</u> A graduate should develop during the training period the following attitudes 1. Willingness to apply the current knowledge of dentistry in the best interest of the patient and community. 2. Maintain a high standard of professional ethics and conduct and apply these in all aspects of professional life. 3. Seek to improve awareness and provide possible solutions for oral health problems and needs throughout the community.

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		4. Willingness to participate in the CDE programmes to update knowledge and professional skill from time to time 5. Help and participate in the implementation of the national oral health policy. d. INTEGRATION: Horizontal integration - Provision of learning within the structure where individual departments/subject areas contribute to the development and delivery of learning in a meaningful, holistic manner. Links are made between the different subject areas and that learning is enriched by the connections and interrelationships being made explicit by this process. Vertical integration - combination of basic and clinical sciences in such a way that the traditional divide between preclinical and clinical studies is broken down. Basic science is represented explicitly in the curriculum within the clinical environments during all the years of undergraduate education and beyond into postgraduate training and continuing professional development. (e.g.) All the students studied a case of Oral cancer - the second-year student prepared the pathology part while the intern correlated it with the case presentation. This was followed by a first year explaining the anatomy and the final year explaining the signs, symptoms, grading and staging, The surgical part was correlated with anatomy by the postgraduate.
Fourth Year BDS	***Public Health Dentistry***	a. KNOWLEDGE: Apply basic sciences knowledge regarding etiology, diagnosis and management of all the oral conditions at the individual and community level Identify social, economic, environmental and emotional determinants in a given individual patient or a community for the purpose of planning and execution of community oral health programme. Ability to conduct oral health surveys in order to identify all the oral health problems affecting the community and find solutions using multi-disciplinary approach. Ability to act as a consultant in Community Oral Health and take part in research (both basic and clinical), present and publish the outcome at various scientific conferences and journals, both national and international. b. SKILLS:

		Take history, conduct clinical examination including all diagnostic procedures to arrive at diagnosis at the individual level and conduct survey of the community at a state and national level of all conditions related to oral health to arrive at community diagnosis. Plan and perform all necessary treatment , prevention, and promotion of Oral Health at the individual and community level. Plan appropriate Community Oral Health Programme, conduct the programme and evaluate, at the community level. Ability to make use of knowledge of epidemiology to identify causes and plan appropriate preventive and control measures. Develop appropriate person power at various levels and their effective utilization. Conduct survey and use appropriate methods to impart Oral Health Education Develop ways of helping the community towards easy payment plan, followed by evaluation of their oral health care needs. Develop the planning, implementation, evaluation and administrative skills to carry out successful Community oral Health programmes c. ATTITUDE: Adopt ethical principles in all aspects of Community Oral Health activities. To apply ethical and moral standards while carrying out epidemiological research. Develop communication skills, in particular to explain the causes and prevention of oral health diseases to the patient. Be humble and accept the limitations in his knowledge and skill and to ask for help from colleagues when needed and promote teamwork approach. Respect patient's rights and privileges including patient's right to information and right to seek a second opinion d. INTEGRATION: At the conclusions of the course the student should be able to communicate the needs of the community efficiently, inform the society of all the recent methodologies in preventing oral disease.

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COURSE OUTCOME FOR POST GRADUATES STUDENTS

PROSTHODONTICS AND CROWN & BRIDGE

SUBJECT	COURSE OUTCOME
PROSTHODONTICS AND CROWN & BRIDGE	**AIM:** To train the dental graduates so as to ensure higher level of competence in both general and specialty areas of Prosthodontics and prepare candidates with teaching, research and clinical abilities including prevention and after care in Prosthodontics – removable dental prosthodontics, fixed dental prosthodontics (Crown &Bridge), implantology, maxillofacial prosthodontics and esthetic dentistry. **GENERAL OBJECTIVES OF THE COURSE:** Training program for the dental graduates in Prosthetic dentistry– removable dental prosthodontics, fixed dental prosthodontics (Crown & Bridge), implantology, maxillofacial prosthodontics and esthetic dentistry and Crown & Bridge including Implantology is structured to achieve knowledge and skill in theoretical and clinical laboratory, attitude, communicative skills and ability to perform research with a good understanding of social, cultural, educational and environmental background of the society. • To have adequate acquired knowledge and understanding of applied basic and systemic medical sciences, both in general and in particularly of head and neck region. • The postgraduates should be able to provide Prosthodontic therapy for patients with competence and working knowledge with understanding of applied medical, behavioral and clinical science, that are beyond the treatment skills of the general BDS graduates and MDS graduates of other specialties, • To demonstrate evaluative and judgment skills in making appropriate decisions regarding prevention, treatment, after care and referrals to deliver comprehensive care to patients. **KNOWLEDGE:** The candidate should possess knowledge of applied basic and systemic medical sciences. • On human anatomy, embryology, histology, applied in general and particularly to head and neck, Physiology & Biochemistry, Pathology Microbiology & virology; health and diseases of various systems of the body (systemic) principles in surgery and medicine, pharmacology, nutrition, behavioral science, age changes, genetics, Immunology, Congenital defects & syndromes and Anthropology, Bioengineering, Bio-medical & Biological Principles • The student shall acquire knowledge of various Dental Materials used in the specialty and be able to provide appropriate indication, understand the

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manipulation characteristics, compare with other materials available, be adept with recent advancements of the same.

• Students shall acquire knowledge and practice of history taking, Diagnosis, treatmentplanning, prognosis, record maintenance of oral, craniofacial and systemic region.

• Ability for comprehensive rehabilitation concept with pre prosthetic treatment plan including surgical re-evaluation and prosthodontic treatment planning, impressions, jaw relations, utility of face bows, articulators, selection and positioning of teeth, teetharrangement for retention, stability, esthetics, phonation, psychological comfort, fit and insertion.

• Instructions for patients in after care and preventive Prosthodontics and management of failed restorations shall be possessed by the students.

• Understanding of all the applied aspects of achieving physical, psychological well-being of the patients for control of diseases and / or treatment related syndromes with the patient satisfaction and restoring function of Cranio mandibular system for a quality life of a patient.

• Ability to diagnose and plan treatment for patients requiring Prosthodontic therapy

• Ability to read and interpret radiographs, and other investigations for the purpose of diagnosis and treatment planning.

• The theoretical knowledge and clinical practice shall include principles involved for support, retention, stability, esthetics, phonation, mastication, occlusion, behavioral, psychological, preventive and social aspects of Prosthodontics science of Oral and Maxillofacial Prosthodontics and Implantology

• Tooth and tooth surface restorations, Complete denture Prosthodontics, removable partial denture Prosthodontics, fixed prosthodontics and maxillofacial and Craniofacial Prosthodontics, implants and implant supported Prosthodontics, T.M.J. and occlusion, craniofacial esthetics, and biomaterials, craniofacial disorders, problems of psychogenic origin.

• Should have knowledge of age changes, geriatric psychology, nutritional considerations and prosthodontic therapy in the aged population.

• Should have ability to diagnose failed restoration and provide prosthodontic therapy and after care.

• Should have essential knowledge on ethics, laws, and Jurisprudence and Forensic Odontology in Prosthodontics.

• Should know general health conditions and emergency as related to prosthodontics treatment like allergy of various materials and first line management of aspiration of prosthesis

• Should identify social, cultural, economic, environmental, educational and emotional determinants of the patient and consider them in planning the treatment.

• Should identify cases, which are outside the area of his specialty / competence, refer them to appropriate specialistsand perform interdisciplinary case management.

• To advice regarding case management involving surgical and interim treatment

• Should be competent in specialization of team management in craniofacial prosthesis design

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• To have adequate acquired knowledge, and understanding of applied basic, and systemic medical science knowledge in general and in particular to head and neck regions.
• Should attend continuing education programmes, seminars and conferences related to Prosthodontics, thus updating himself/herself.
• To teach and guide his/her team, colleagues and other students.
• Should be able to use information technology tools and carry out research both in basic and clinical areas, with the aim of publishing his/ her work and presenting his/her work at various scientific forums.
• Should have an essential knowledge of personal hygiene, infection control, prevention of cross infection and safe disposal of waste, keeping in view the risk of transmission of potential communicable and transmissible infections like Hepatitis and HIV.
• Should have an ability to plan and establish Prosthodontics clinic/hospital teaching department and practice management.
• Should have a sound knowledge (of the applications in pharmacology, effects of drugs on oral tissues and systems of body and in medically compromised patients.

SKILLS:

• The candidate should be able to examine the patients requiring Prosthodontic therapy, investigate the patient systemically, analyze the investigation results, radiographs, diagnose the ailment, plan the treatment, communicate it with the patient and execute it.
• To understand the prevalence and prevention of diseases of craniomandibular system related to prosthetic dentistry.
• The candidate should be able to restore lost functions of stomatognathic system like mastication, speech, appearance and psychological comforts by understanding biological, biomedical, bioengineering principles and systemic conditions of the patients to provide quality health care in the craniofacial regions.
• The candidate should be able to demonstrate good interpersonal, communication skills and team approach in interdisciplinary care by interacting with other specialties including medical specialty for planned team management of patients for craniofacial & oral acquired and congenital defects, temporomandibular joint syndromes, esthetics, Implant supported Prosthetics and problems of Psychogenic origins.
• Should be able to demonstrate the clinical competence necessary to carry out appropriate treatment at higher level of knowledge, training and practice skills currently available in their specialty area with a patient centered approach.
• Should be able to interpret various radiographs like IOPA, OPG, CBCT and CT. Should and be able to plan and modify treatment plan based on radiographic findings
• Should be able to critically appraise articles published and understand various components of different types of articles and be able to gather the weight of evidence from the same
• To identify target diseases and create awareness amongst the population regarding Prosthodontic therapy.
• To perform Clinical and Laboratory procedures with a clear understanding of biomaterials, tissue conditions related to prosthesis and

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have required dexterity & skill for performing clinical and laboratory all procedures in fixed, removable, implant, maxillofacial, TMJ and esthetics Prosthodontics.

- To carry out necessary adjunctive procedures to prepare the patient before prosthesis like tissue preparation and preprosthetic surgery and to prepare the patient before prosthesis / prosthetic procedures
- To understand demographic distribution and target diseases of Cranio mandibular region related to Prosthodontics.
- Computer based lab skills
- Forensic digital and manual record maintenance.

ATTITUDES:

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

COMMUNICATIVE ABILITIES:

- 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.

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COURSE CONTENTS:

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

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ESSENTIAL KNOWLEDGE:

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

APPLIED BASIC SCIENCES:

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

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

APPLIED ANATOMY OF HEAD AND NECK:

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

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

Growth & Development –Facial form and Facial growth and development overview 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 incraniofacial 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

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

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

APPLIED PHYSIOLOGY AND NUTRITION :

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

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

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

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

APPLIED PHARMACOLOGY AND THERAPEUTICS:

Dosage and mode of administration of drugs. Action and fate of drugs in the body, Drug addiction, tolerance and hypersensitive reactions, Drugs acting on the central nervous system, general anesthetics hypnotics, analeptics and tranquillizers. Local anesthetics, Chemotherapeutics and antibiotics, Antitubercular and anti syphilitic drugs, Analgesics and antipyretics, Antiseptics, styptics, Sialogogues and antisialogogues,

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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 histo pathology and clinical pathology.

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

APPLIED ORAL PATHOLOGY:

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

LABORATORY DETERMINATIONS:

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

BIOSTATISTICS:

Characteristics and limitations of statistics, planning of statistical experiments, sampling, collection, classification and presentation of data (Tables, graphs, pictograms etc) & Analysis of data, parametric and non parametric tests Introduction to Biostatistics - Scope and need for statistical application to biological data. Definition of selected terms – scale of measurements related to statistics, Methods of collecting data, presentation of the statistical diagrams and graphs. Frequency curves, mean, mode of median, Standard deviation and co-efficient of variation,

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Correlation – Co-efficient and its significance, Binominal distributions normal distribution and Poisson's distribution, Tests of significance.

RESEARCH METHODOLOGY:

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

All MDS candidates shall compulsorily attend the Research Methodology Workshop conducted by the University within 6 months from the date of joining the course. In this regard, the candidates will be issued a completion Certificate by the University.

APPLIED RADIOLOGY:

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

ROENTGENOGRAPHIC TECHNIQUES

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

APPLIED MEDICINE:

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

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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.
- **Tell show do technique –training skills.**

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

ORAL AND MAXILLOFACIAL PROSTHODONTICS AND IMPLANTOLOGY:

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

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

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

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

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

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

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

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

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

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

(f) Preparing patient for complete denture patients –Diagnosis and treatment planning for edentulous and partially edentulous patients – familiarity with patients, principles of perception, health questionnaires and identification data, problem identification, prognosis and treatment identification data, problem identification, prognosis and treatment planning – contributing history – patient's history, social information, medical status – systemic status with special reference to debilitating diseases, diseases of the joints, cardiovascular disorders, diseases of the skin, neurological disorders, oral malignancies, climacteric, use of drugs, mental health – mental attitude, psychological changes, adaptability, geriatric changes – physiologic, pathological, pathological and intra oralchanges. 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.

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	Biomechanical considerations – jaw relations, border tissues, saliva, muscular development – muscle tone, neuromuscular co-ordination, tongue, cheek and lips. Interpreting diagnostic findings and treatment planning. (g) **Pre prosthetic surgery** –Improving the patients denture bearing areas andridge relations. (h) **Non surgical methods** –rest for the denture supporting tissues, occlusal correction of the old prosthesis, good nutrition, conditioning of the patients musculature, (i) **Surgical methods** –Correction of conditions, that preclude optimal prosthetic function – hyperplastic ridge – epulis fissuratum and papillomatosis, frenular attachments and pendulous maxillary tuberosities, ridge augmentation, maxillary and mandibular oral implants, corrections of congenital deformities, discrepancies in jaw size, relief of pressure on the mental foramen, enlargement of denture bearing areas, vestibuloplasty, ridge augmentation, replacement of tooth roots with Osseo integrated denture implants. **(j) Immediate Denture** –Advantages, Disadvantages, Contraindications,Diagnosis, treatment planning and Prognosis, Explanation to the patient, Oral examinations, Examination of existing prosthesis, Tooth modification, Prognosis, Referrals/adjunctive care, oral prophylaxis and other treatment needs. First visit, preliminary impressions and diagnostic casts, management of loose teeth, custom trays, final impressions and master casts, two tray or sectional custom impression tray, location of posterior limit and jaw relation records, setting of the posterior denture teeth / verifying jaw relations and the patient try in. Laboratory phase, setting of anterior teeth, Wax contouring, flasking and boil out, processing and finishing, surgical templates, surgery and immediate denture insertion, post operative care and patient instructions, subsequent service for the patient on the immediate denture. (k**) Over dentures** (tooth supported complete dentures)–indications andtreatment planning, advantages and disadvantages, selection of abutment teeth, loss of abutment teeth, tooth supported complete dentures. Non-coping abutments, abutment with copings, abutments with attachments, submerged vital roots, preparations of the retained teeth. (l) Single Dentures: Single Mandibular denture to oppose natural maxillaryteeth, single complete maxillary denture to oppose natural Mandibular teeth to oppose a partially edentulous Mandibular arch with fixed prosthesis, partially edentulous Mandibular arch with removable partial dentures. Opposing existing complete dentures, preservation of the residual alveolar ridge, necessity for retaining maxillary teeth and preventing mental trauma. (m) **Art of communication in the management of the edentulous predicament –** Communication–scope, a model of communication, why communication is important? What are the elements of effective communication? special significance of doctor / patient communication, doctor behavior, The iatro sedative (doctor & act of making calm) recognizing and acknowledging the problem, exploring and identifying the problem, interpreting and explaining the problem, offering a solution to the problem for mobilizing their resources to operate in a most efficient

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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, denturelining materials and tissue conditioners, cast metal alloys as denture bases – base metal alloys.

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

(p) **Fabrication of complete dentures** –complete denture impressions– muscles of facial expressions and anatomical landmarks, support, retention, stability, aims and objectives of preservation, support, stability, aesthetics, and retention. Impression materials and techniques – need of 2 impressions the preliminary impression and final impressions. Developing an analogue / substitute for the maxillary denture bearing area – anatomy of supporting structures – mucous membrane, hard palate, residual ridge, shape of the supporting structure and factors that influence the form and size of the supporting bones, incisive foramen, maxillary tuberosity, sharp spiny process, torus palatinus, Anatomy of peripheral or limiting structures, labial vestibule, Buccal vestibule, vibrating lines. Preliminary and final impressions, impression making, custom tray and refining the custom tray, preparing the tray to secure the final impression, making the final impression, boxing impression and making the casts Developing an analogue / substitute for the Mandibular denture bearing area- anatomy of supporting structure, crest of the residual ridge, buccal shelf, shape of 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.

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(r) **Selecting and arranging artificial teeth and occlusion for the edentulous patient** – anterior tooth selection, posterior tooth selection, and principles in arrangement of teeth, and factors governing the position of teeth – horizontal & vertical relations. The inclinations and arrangement of teeth for aesthetics, phonetics and mechanics – to concept of occlusion.

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

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

(u) **Waxing contouring and processing the dentures their fit and insertion and after care –laboratory procedure**–wax contouring, flasking andprocessing, laboratory remount procedures, selective grinding, finishing and polishing. Critiquing the finished prosthesis – doctors evaluation, patients evaluation, friends evaluation, elimination of basal surface errors, errors in occlusion, interocclusal records for remounting procedures – verifying centric relation, eliminating occlusal errors. Special instructions to the patient – appearance with new denture, mastication with new dentures, speaking with new dentures, oral hygiene with dentures, preservation of residual ridges and educational material for patients, maintaining the comfort and health of the oral cavity in the rehabilitated edentulous patients. Twenty-four hours oral examination and treatment and (preventive) Prosthodontic – periodontic recall for oral examination 3 to 4 months intervals and yearly intervals.

(v) **Implant supported Prosthesis for partially edentulous patients** – Scienceof Osseo integration, clinical protocol (diagnostic,surgical and prosthetic) for treatment with implant supported over dentures, managing problems and complications. Implant Prosthodontics for edentulous patients: current and future directions. Implant supported prosthesis for partially edentulous patients – Clinical and laboratory protocol: Implant supported prosthesis, managing problems and complications o Introduction and Historical Review o Biological, clinical and surgical aspects of oral implants o Diagnosis and treatment planning o Radiological interpretation for selection of fixtures o Splints for guidance fort surgical placement of fixtures o Surgical and Intra oral plastic surgery, if any o Guided bone and Tissue regeneration consideration for implants fixture. o Implant supported prosthesis for complete edentulism and partial edentulism o Occlusion for implant supported prosthesis. o Peri-implant tissue and Management of peri-implantitis o Maintenance and after care o Management of failed restoration. o Work authorization for implant supported prosthesis – definitive instructions, legal aspects, delineation of responsibility.

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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 extensionsfrom Occlusal rests, canine rests, continuous bar retainers and linguoplates, modification areas, rugae support, direct – indirect retention. (vi) Teeth and denture bases – types, materials, advantages and dis-advantages, indications and contraindications and clinical use. Principles of removable partial Denture design – Bio mechanical considerations, and the factors influencing after mouth preparations – Occlusal relationship of remaining teeth, orientation of Occlusal plane, available space for restoration, arch integrity, tooth morphology, response of oral structure to previous stress, periodontal conditions, abutment support, tooth supported and tooth and tissue supported, need for indirect retention, clasp design, need for rebasing, secondary impression, need for abutment tooth modification, type of major connector, type of teeth selection, patients past experience, method of replacing single teeth or missing anterior teeth. Difference between tooth supported and tissue supported partial dentures. Essentials of partial denture design, components of partial denture design, tooth support, tissue support, stabilizing components, guiding planes, use of splint bar for denture support, internal clip attachments, overlay abutment as support for a denture base, use of a component partially to gain support

. c. Education of patient

d. Diagnosis and treatment planning

e. Design, treatment sequencing and mouth preparation

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

g. Diagnosis and treatment planning –Infection control and cross infectionbarriers – clinical and laboratory and hospital waste management, Objectives of prosthodontic treatment, Records, systemic evaluation, Oral examination, preparation of diagnostic cast, Interpretation of examination

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data, radiographic interpretation, periodontal considerations, caries activity, prospective surgical preparation, endodontic treatment, analysis of occlusal factors, fixed restorations, orthodontic treatment, need for determining the design of components, impression procedures and occlusion, need for reshaping remaining teeth, reduction of unfavorable tooth contours, differential diagnosis : fixed or removable partial dentures, choice between complete denture and removable partial dentures, choice of materials

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

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

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

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

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

m. Initial placement, adjustment and servicing of the removable partial denture – adjustments to bearing surfaces of denture framework, adjustmentof occlusion in harmony with natural and artificial dentition, instructions to the patient, follow – up services n. Relining and Rebasing the removable partial denture –Relining toothsupported dentures bases, relining distal extension denture bases, methods of reestablishing occlusion on a relined partial denture.

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

p. Removable partial denture considerations in maxillofacial prosthetics – Maxillofacial prosthetics, intra oral prosthesis, design considerations, maxillary prosthesis, Obturators, speech aids, palatal lifts, palatal augmentations, mandibular prosthesis, treatment planning, framework

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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

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determining the plane of occlusion, restoring lower posterior teeth, restoring upper posterior teeth, functionally generated path techniques for recording border movements intra orally, occlusal equilibration. Bruxism, Procedural steps in restoring occlusion, requirements for occlusal stability, solving occlusal problems through programmed treatment planning, splinting, solving – occlusal wear problems, deep overbite problems, anterior overjet problems, anterior open bite problems. Treating – end to end occlusion, splaed anterior teeth, cross bite problems, Crowded, irregular, or interlocking anterior bite. Using Cephalometric for occlusal analysis, solving severe arch malrelationship problems, transcranial radiography, postoperative care of occlusal therapy.

IV. FIXED PROSTHODONTICS

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

• **Diagnosis and treatment planning** –patients history and interview, patientsdesires and expectations and needs, systemic and emotional health, clinical examinations – head and neck, oral – teeth, occlusal and periodontal, Preparation of diagnostic cast, radiographic interpretation, Aesthetics, endodontics considerations, abutment selection – bone support, root proximities and inclinations, selection of abutments for cantilever, pier abutments, splinting, available tooth structures and crown morphology, TMJ and muscles of mastication and comprehensive planning and prognosis

. • **Management of Carious teeth** –caries in aged population, caries control,removal caries, protection of pulp, reconstruction measure for compromised teeth – retentive pins, horizontal slots, retentive grooves, prevention of caries, diet, prevention of root caries and vaccine for caries.

• **Periodontal considerations** –attachment units, ligaments, prevention ofgingivitis, periodontitis. Microbiological aspect of periodontal diseases, marginal lesion, occlusal trauma, periodontal pockets in attached gingiva, interdental papilla, gingival embrasures, gingival/periodontal prosthesis, radiographic interpretations of Periodontia, intraoral, periodontal splinting – Fixed prosthodontics with periodontially compromised dentitions, placement of margin restorations.

• **Biomechanical principles of tooth preparation** –individual tooth preparations - Complete metal Crowns – P.F.C., All porcelain – Cerestore crowns, dicor crowns, inceram etc. porcelain jacket crowns; partial 3/4, 7/8, telescopic, pin– ledge, laminates, inlays, onlays. Preparations for restoration of teeth– amalgam, glass Ionomer and composite resins. Resin bond retainers, Gingival marginal preparations – Design, material selection, and biological and mechanical considerations – intracoronal retainer and precision attachments – custom made and prefabricated.

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• **Isolation and fluid control** – Rubber dam application(s), tissue dilation– softtissue management for cast restoration, impression materials and techniques, provisional restorations, interocclusal records, laboratory support for fixed Prosthodontics, Occlusion, Occlusal equilibration, articulators, recording and transferring of occlusal relations, cementing of restorations.

• **Resins, Gold and gold alloys, glass Ionomer, restorations**.

• **Restoration of endodontically treated teeth, Stomatognathic Dysfunction and management**

• **Management of failed restorations Osseo integrated supported fixed Prosthodontics** –Osseo integratedsupported and tooth supported fixed Prosthodontics

• **CAD – CAM Prosthodontics**

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

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

• Etiology, diagnosis and cranio mandibular pain, differential diagnosis and management of orofacial pain – pain from teeth, pulp, dentin, muscle pain, TMJ pain – psychologic, physiologic – endogenous control, acupuncture analgesia, Placebo effects on analgesia, Trigeminal neuralgia, Temporal arteritis

• Occlusal splint therapy – construction and fitting of occlusal splints, management of occlusal splints, therapeutic effects of occlusal splints, occlusal splints and general muscles performance, TMJ joint uploading and anterior repositioning appliances, use and care of occlusal splints.

• Occlusal adjustment procedures – Reversible – occlusal stabilization splints and physical therapies, jaw exercises, jaw manipulation and other physiotherapy or irreversible therapy – occlusal repositioning appliances, orthodontic treatment, 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.

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TEACHING LEARNING METHODS (including Clinical Study)

(a) LECTURES: There shall be some didactic lectures in the speciality and in the allied fields. The departments shall encourage guest lectures in the required areas and integrated lectures by multi-disciplinary teams on selected topics, to strengthen the training programmes.

(b) JOURNAL REVIEW: The journal review meetings shall be held at least once a week. All trainees, associate and staff associated with the post-graduate programme are expected to participate actively and enter relevant details in the logbook. The trainee shall make presentations from the allotted journals of selected articles.

(c) SEMINARS: The seminars shall be held at least twice a week in each department. All trainees are expected to participate actively and enter relevant details in logbook.

(d) SYMPOSIUM: It is recommended to hold symposium on topics covering multiple disciplines.

(e) CLINICAL POSTINGS: Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases.

(f) CLINICO-PATHOLOGICAL CONFERENCE: The clinico pathological conference shall be held once a month involving the faculties of Oral Medicine and Radiology, Oral Pathology and allied clinical departments. The trainees shall be encouraged to present the clinical details, radiological and histo-pathological interpretations and participation in the discussions.

(g) INTER-DEPARTMENTAL MEETINGS: To encourage integration among various specialities, there shall be inter-departmental meeting chaired by the Dean with all heads of post-graduate departments at least once a month.

(h) TEACHING SKILLS: All the trainees shall be encourages to take part in undergraduate teaching programmes either in the form of lectures or group discussion.

(i) DENTAL EDUCATION PROGRAMMES: Each department shall organise dental education programmes on regular basis involving other institutions. The trainees shall also be encouraged to attend such programmes conducted outside their university or institute.

(j) CONFERENCES/WORKSHOPS/ADVANCED COURSES: The trainees shall be encouraged to attend conference/workshops/advanced courses and also to present at least two scientific papers and two posters at State/national level speciality and allied conferences/conventions during the training period.

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(k) ROTATION AND POSTING IN OTHER DEPARTMENTS: To bring in more integration among the specialities and allied fields, each department shall workout a programme to rotate the trainees in related disciplines.

VI. ESTHETICS

SCOPE, DEFINITIONS :

Morpho psychology and esthetics, structural esthetic rules – facialcomponents, dental components, gingival components and physical components. Esthetics and its relationship to function – Crown morphology, physiology of occlusion, mastication, occlusal loading and clinical aspect in bio esthetic aspects, Physical and physiologic characteristic and muscular activities of facial muscle, perioral anatomy and muscle retaining exercises Smile – classification and smile components, smile design, esthetic restoration of smile, Esthetic management of the dentogingival unit, intraoral materials for management of gingival contours, and ridge contours, Periodontal esthetics, Restorations – Tooth colored restorative materials, the clinical and laboratory aspects, marginal fit, anatomy, inclinations, form, size, shape, color, embrasures & contact point. Prosthodontic treatment should be practiced by developing skills, by treating various and more number of patients to establish skill to diagnose and treatment and after care with bio-mechanical, biological, bio-esthetics, bio-phonetics. All treatments should be carried out in more numbers for developing clinical skills. • Infection control, cross infection barrier – clinical & lab ; hospital & lab waste management.

COURSE YEAR	TEACHING / LEARNING ACTIVITIES:
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.

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		• 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 & bioesthetics, 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 patientsrequiring tooth and tooth surface restorations • Fabrication of adequate number of complete denture prosthesis following, higher clinical approach by utilizing semi-adjustable articulators, face bow and graphic tracing. • Understanding the use of dental surveyor and its application in diagnosis and treatment plan in R.P.D. • Adequate number of R.P.D's covering all partially edentulous situations. • Adequate number of Crowns, Inlays, laminates, FDP (fixed dental prosthesis) covering all clinical situations. • Selection of cases and following principles in treatment of partially or complete edentulous patients by implant supported prosthesis. • Treating single edentulous arch situations by implant supported prosthesis. • Diagnosis and treatment planning for implant prosthesis. • Ist stage and IInd stage implant surgery • Understanding the maxillofacial Prosthodontics, treating craniofacial and management of orofacial defects • Prosthetic management of TMJ syndrome • Occlusal rehabilitation

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		• 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

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PROCEDURE	CATEGORY			
	O	A	PA	PI
Tooth and tooth surface restoration a) Composites – fillings, laminates, inlay, onlay b) Ceramics – laminates, inlays, onlays c) Glass Ionomer				5 5 5
CROWNS				
FVC for metal	1	2	2	10
FVC for ceramic	1	2	2	10
Precious metal crown or Galvanoformed crown	1	-	1	5
Intra radicular crowns (central, lateral, canine, premolar, and molar)	1	-	-	5
	As many	5	5	5

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FIXED PARTIAL DENTURES				
Cast Porcelain (03 Units)			1	5
Cast Metal / Precious & Non Precious (3unit posterior)			1	5
Porcelain fused to metal (anterior and posterior)	1	1	1	10
Multiple abutments – maxillary and Mandibular full arch	1	1	1	5
Incorporation of custom made and prefabricated precision attachments	1	1	2	4
Adhesive bridge for anterior/posterior				5

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CAD – CAM Anterior/Posterior FPD				5
Metal fused to resin Anterior FPD			1	5
Interim provisional restorations (crowns and FPDs)	1	1	1	10
Immediate fixed partial dentures (interim) with ovate pontic	1	-	-	5
Fixed prosthesis as a retention and rehabilitation means for acquired and congenital defects – maxillofacial Prosthetics	1	1	1	5
Implant supported prosthesis	1	-	1	1
Implant – tooth supported prosthesis	1	-	1	1
REMOVABLE PARTIAL DENTURE				
Provisional partial denture	1	1	1	10

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Anatomic characterized prosthesis (by using semi adjustable articulator)	-	-	1	5
Single dentures	-	-	1	5
Overlay dentures	-	-		
Interim complete dentures as a treatment prosthesis for abused denture supporting tissues	-	-	1 1	5 5
Complete denture prosthesis (for abnormal ridge relation ridge form	-	-		

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patients	-	-	1	5
GERIATRIC PATIENTS Handling geriatric patients requiring nutritional counseling, psychological management and management of co-morbitity including xerostomia and systemic problems. Palliative care to elderly.				30
IMPLANT SUPPORTED COMPLETE PROSTHESIS Implant supported complete prosthesis (maxillary And - Mandibular)	-	-	1	1
MAXILLOFACIAL PROSTHESIS Guiding flange				

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obturator				
Speech and palatal lift prosthesis				
eye prosthesis				
Ear prosthesis				
Nose prosthesis			1	
Face prosthesis			1	4
Maxillectomy			1	2
Hemi mandibulectomy			1	2
Cranioplasty			1	
Finger head foot			1	2
Body prosthesis			1	2
Management of burns and scars			1	2

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

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MANAGEMENT OF FAILED RESTORATION Tooth and tooth				
Removable prosthesis Crown and fixed prosthesis Maxillofacial prosthesis Implant supported prosthesis Occlusal rehabilitation and TMJ syndrome Restoration failures of psychogenic origin				10 5 2 1 2 5
Restoration failures to age changes				2

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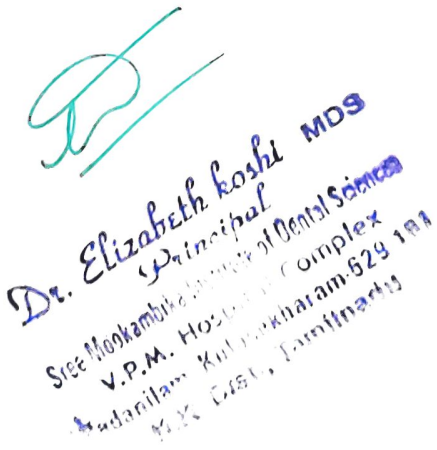
surface restorations				5



SCEINTIFIC PRESENTATIONS;

Journal club -5

Seminar -5

Scentific paper-3

Sceintific poster-3

Clinical discussion- 2

Other posting -1

DISSERTATION- Submission of Protocol, Continuous Evaluation of Dissertation, Submission of completed Dissertation:

Every candidate appearing for the post-graduate degree examination shall at least six months prior to the examinations, submit with his form for examination, four typewritten copies of the dissertation undertaken by the candidate, prepared under the direction and guidance of his/her guide.

Removable prosthesis - - - 10 Crowns and fixed prosthesis - - - 5 Maxillofacial prosthesis - - - 2 Implant supported prosthesis - - - 1 Occlusal rehabilitation and TMJ syndrome - - - 2 Restoration failures of psychogenic origin - - - 5 Restoration failures to age changes - - - 2It must be approved by the Institutional Review Board consisting of Principal, all the HOD's, an advocate, medical specialties and social worker within the first six months after the commencement of the course. The application for registration of dissertation topic must be sent through the Principal duly forwarded by the Professor/ HOD. The University will register such dissertation topic. In case, the students want to change the topic of dissertation, they can do it within the next three months. No change in the Guide/dissertation topic shall be made without prior approval of the University.

The aim of dissertation is to train a postgraduate student in research methodology. It includes identification of a problem with recent advances, designing of research study on collection of data, practical analysis and comparison of results and drawing conclusions.

The dissertation should be written under the following headings. Introduction / Aims and objective/ Review and literature/ Materials & Methods/ Results/ Discussion Conclusion/Summary

The written text of dissertation shall not be less than 100pages.

It should be neatly typed in double line spacing on one side (A4 size, 8. 27"x 11.69") and bounded properly. Photos, charts,

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	tables, tables and graphs can be attached where ever necessary. Spiral binding should not be used. The dissertation shall be certified by the Guide and Head of the department and forwarded by the Principal to the University. The dissertation so submitted shall be referred to the examiners for their examination and acceptance of it shall be a condition precedent to allow the candidate to appear for the written part of the examination. Provided that a candidate whose dissertation has been accepted by the examiner, but declared failed at the examination, shall be permitted to re-appear at the subsequent examination without a new dissertation. Provided further that if the dissertation is rejected by the examiner, the examiner shall assign reasons thereof with suggestions for its improvement to the candidate and such candidate shall re-submit his/ her dissertation to the examiner who shall accept it before appearing in the examination.

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PERIODONTOLOGY

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

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B) SKILLS:

- Take a proper clinical history, thorough examination of intra oral, extra oral, medical history evaluation, advice essential diagnostic procedures and interpret them to come to a reasonable diagnosis
- Effective motivation and education regarding periodontal disease maintenance after the treatment
- Perform both non-surgical & education regarding periodontal disease, maintenance after the treatment
- Perform both non-surgical and surgical procedures independently
- Provide Basic Life Support Service (BLS) recognizes the need for advance life support and does the immediate need for that.
- Human values, ethical practice to communication abilities2
- Adopt ethical principles in all aspects of treatment modalities; Professional honesty & integrity are to be fostered. Develop Communication skills to make awareness regarding periodontal disease Apply high moral and ethical standards while carrying out human or animal research, Be humble, accept the limitations in his/her knowledge and skill, and ask for help from colleagues when needed, Respect patients rights and privileges, including patients right to information and right to seek a second opinion.
- To learn the principal of lip repositioning and perio-aesthetics surgeries.

COURSE CONTENTS:

PART-I:

APPLIED BASIC SCIENCES

APPLIED ANATOMY:

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

PHYSIOLOGY:

1. Blood
2. Respiratory system – knowledge of the respiratory diseases which are a cause of periodontal diseases (Periodontal Medicine)
3. Cardiovascular system a. Blood pressure b.Normal ECG c. Shock
4. Endocrinology – hormonal influences on Periodontium

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5. Gastrointestinal system a.Salivary secretion – composition, function & regulation b.Reproductive physiology c. Hormones – Actions and regulations, role in periodontal disease d.Family planning methods
6. Nervous system a.Pain pathways b.Taste – Taste buds, primary taste sensation & pathways for sensation
7. Hemostasis

BIOCHEMISTRY:

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

PATHOLOGY:

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

MICROBIOLOGY:

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

PHARMACOLOGY:

1. General pharmacology
   a. Definitions – Pharmacokinetics with clinical applications, routes of administration including local drug delivery in Periodontics b. Adverse drug reactions and drug interactions

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2. Detailed pharmacology of a. Analgesics – opiod and nonopiod b. Local anesthetics c. Haematinics and coagulants, Anticoagulants d. Vit D and Calcium preparations e. Antidiabetics drugs f. Steroids g. Antibiotics h. Antihypertensive I. Immunosuppressive drugs and their effects on oral tissues j. Antiepileptic drugs

3. Brief pharmacology, dental use and adverse effects of a. General anesthetics b. Antipsychotics c. Antidepressants d. Anxiolytic drugs e. Sedatives f. Antiepileptics4 g. Antihypertensives h. Antianginal drugs i. Diuretics j. Hormones k. Pre-anesthetic medications

4. Drugs used in Bronchial asthma, cough

5. Drug therapy of a.Emergencies b.Seizures c. Anaphylaxis d.Bleeding e.Shock f. Diabetic ketoacidosis g.Acute addisonian crisis

6. Dental Pharmacology a.Antiseptics b.Astringents c. Sialogogues d.Disclosing agents e.Antiplaque agents

7. Fluoride pharmacology

BIOSTATISTICS:

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

PART II

PAPER 1

ETIOPATHOGENESIS:

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

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PAPER-II

CLINICAL AND THERAPEUTIC PERIODONTOLOGY AND ORAL IMPLANTOLOGY

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

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

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

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

B. Periodontal instrumentation

1. Periodontal Instruments 2. Principles of periodontal instrumentation 3. Instruments used in various parts of the mouth

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

D. Periodontal surgical phase – special emphasis on drug prescription

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

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

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

(iv) ORAL IMPLANTOLOGY

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

(v) MANAGEMENT OF MEDICAL EMERGENCIES IN PERIODONTAL PRACTICE

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

Training in research methodology, Biostatistics, Ethics / Bio-ethics in dentistry, Jurisprudence and Audits

Adopt ethical principles in all periodontic practice. Professional honesty and integrity are to be fostered. Treatment to be delivered irrespective of social status, caste, creed or religion of patient. Respect patient's rights and privileges including patients right to information and right to seek second opinion. Understanding, Observation, Correlation, Experimentation

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and evaluating dental research, scientific method, hypothesis and Research Strategies.

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.

All MDS candidates shall compulsorily attend the Research Methodology Workshop conducted by the University within 6 month from the date of joining the course. In this regard, the candidates will be issued a completion Certificate by the University. TEACHING LEARNING METHODS (including Clinical Study)

(a) **LECTURES:**
There shall be some didactic lectures in the speciality and in the allied fields. The departments shall encourage guest lectures in the required areas and integrated lectures by multi-disciplinary teams on selected topics, to strengthen the training programmes.

(b) JOURNAL REVIEW:
The journal review meetings shall be held at least once a week. All trainees, associate and staff associated with the post-graduate programme are expected to participate actively and enter relevant details in the logbook. The trainee shall make presentations from the allotted journals of selected articles.

(c) SEMINARS: The seminars shall be held at least twice a week in each department. All trainees are expected to participate actively and enter relevant details in logbook.

(c) SYMPOSIUM: It is recommended to hold symposium on topics covering multiple disciplines.

(e) CLINICAL POSTINGS: Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases.

(f) CLINICO-PATHOLOGICAL CONFERENCE: The clinico pathological conference shall be held once a month involving the faculties of Oral Medicine and Radiology, Oral Pathology and allied clinical departments. The trainees shall be encouraged to present the clinical details, radiological and histo-pathological interpretations and participation in the discussions.

(g) INTER-DEPARTMENTAL MEETINGS: To encourage integration among various specialities, there shall be inter-departmental meeting chaired by the Dean with all heads of post-graduate departments at least once a month.

(h) TEACHING SKILLS: All the trainees shall be encourages to take part in undergraduate teaching programmes either in the form of lectures or group discussion.

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(i) DENTAL EDUCATION PROGRAMMES: Each department shall organise dental education programmes on regular basis involving other institutions. The trainees shall also be encouraged to attend such programmes conducted outside their university or institute.

(j) CONFERENCES/WORKSHOPS/ADVANCED COURSES: The trainees shall be encouraged to attend conference/workshops/advanced courses and also to present at least two scientific papers and two posters at State/national level speciality and allied conferences/conventions during the training period.

(k) ROTATION AND POSTING IN OTHER DEPARTMENTS: To bring in more integration among the specialities and allied fields, each department shall workout a programme to rotate the trainees in related disciplines.

COURSE YEAR	TEACHING / LEARNING ACTIVITIES:
I YEAR M.D.S.	**1. Module 1** 1. X-ray techniques and interpretation. 2. Local anaesthetic techniques. 3. Identification of Common Periodontal Instruments. 4. To learn science of Periodontal Instruments maintance (Sharpening , Sterlization and Storate) 5. Concept of Biological width **a. Typhodont Exercise** (i) Class II Filling with Band and Wedge Application (ii) Crown cuttings **b. Medical** 1. Basic diagnostic microbiology and immunology, collection and handling of sample and culture techniques. 2. Introduction to genetics, bioinformatics. 3. Basic understanding of cell biology and immunological diseases. **Clinical work** 1. Applied periodontal indices 10 cases 2. Scaling and root planning:- with Proper written history a. Manual 20 Cases b. Ultrasonic 20 Cases 3. Observation / assessment of all periodontal procedures including implants9 **2. Module 2** 1. Interpretation of various bio-chemical investigations. 2. Practical training and handling medical emergencies and basic life support devices.

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		3. Basic biostatistics – Surveying and data analysis. **Clinical** 1. Case history and treatment planning 10 cases 2. Root planning 50 cases 3. Observation / assessment of all periodontal procedures including implant. 4. Selection of topic for Library dissertation and submission of Dissertation Synopsis. **3. Module 3** Minor surgical cases 20 cases (i) Gingival Depigmentation 3 Cases (ii) Gingival Curettage no limits (iii) ENAP 1 Case (iv) Gingivectomy/ Gingivoplasty 5 cases (v) Operculectomy 3 cases **Poster Presentation at the Speciality conference**
	II YEAR M.D.S.	**4. Module 4** **Clinical work** 1. Case history and treatment planning 10 cases 2. Occlusal adjustments 10 cases 3. Perio splints 10 cases 4. Local drug delivery techniques 5 cases 5. Screening cases for dissertation **5. Module 5** 1. Periodontal surgical procedures. a. Basic flap procedures 20 cases 2. Periodontal plastic and esthetic 10 cases a. Increasing width of attached gingival 5 cases b. Root coverage procedures / Papilla Preservation and Reconstruction 5 cases c. Crown lengthening procedures 5 cases d. Frenectomy 5 cases e. Vestibuloplasty 5 cases 3. Furcation treatment (Hemisection, Rootsection, Tunelling) 5 cases 4. Surgical closure of diastema. 2 cases
	III YEAR M.D.S	**6. Module 6** 1. Ridge augmentation procedures 5 cases 2. Implants Placements and monitoring 5 cases 3. Sinus lift procedures 2 cases 4. Case selection, preparation and investigation of implants. 5. Interdisciplinary Periodontics 2 each (i) Ortho – Perio (ii) Endo – Perio (iii) Restorative Perio (iv) Preprosthetic

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		(v) Crown Prep 6. Osseous Surgery 2 each (i) Resective (ii) Regenerative 7. Scientific paper/ poster presentation at the conference-10 **7. Module 7** **Clinical work** 1. Flap surgeries & regenerative techniques 25 cases (using various grafts & barrier membranes) 2. Assistance / observation of advanced surgical procedure 5 each 3. Micro Surgery 5 each 4. Record maintenance & follow-up of all treated cases including implants. 5. Submission of dissertation – 6 months before completion of III year. 6. Scientific paper presentation at conferences. **8. Module 8** 1. Refining of surgical skills. 2. Publication of an article in a scientific journal. 3. Preparation for final exams. **9. Module 9** 1. Preparation for final exams. 2. University exam
		Note: Maintenance of Work Diary / Check list / Log books as prescribed. **ASSESSMENT EXAMINATION:** In addition to regular evaluation, log book etc., Assessment examination should be conducted after every 3 modules & progress of the student monitored. **MONITORING LEARNING PROGRESS:** It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring is to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. **DISSERTATION** Every candidate appearing for the post-graduate degree examination shall at least six months prior to the examinations, submit with his form for

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	examination, four typewritten copies of the dissertation undertaken by the candidate, prepared under the direction and guidance of his/her guide. It must be approved by the Institutional Review Board consisting of Principal, all the HOD's, an advocate, medical specialties and social worker within the first six months after the commencement of the course. The application for registration of dissertation topic must be sent through the Principal duly forwarded by the Professor/ HOD. The University will register such dissertation topic. In case the students want to change the topic of dissertation, they cando it within the next three months. No change in the Guide/dissertation topic shall be made without prior approval of the University. The aim of dissertation is to train a postgraduate student in research methodology. It includes identification of a problem with recent advances, designing of research study on collection of data, practical analysis and comparison of results and drawing conclusions. The dissertation should be written under the following headings. Introduction / Aims and objective / Review and literature / Materials & Methods /Results / Discussion Conclusion / Summary The written text of dissertation shall not be less than 100pages. It should be neatly typed in double line spacing on one side (A4 size, 8. 27"x 11.69") and bounded properly. Photos, charts, tables, tables and graphs can be attached where ever necessary. Spiral binding should not be used. The dissertation shall be certified by the Guide and Head of the department and forwarded by the Principal to the University. The dissertation so submitted shall be referred to the examiners for their examination and acceptance of it shall be a condition precedent to allow the candidate to appear for the written part of the examination. Provided that a candidate whose dissertation has been accepted by the examiner, but declared failed at the examination, shall be permitted to re-appear at the subsequent examination without a new dissertation. Provided further that if the dissertation is rejected by the examiner, the examiner shall assign reasons thereof with suggestions for its improvement to the candidate and such candidate shall re-submit his/ her dissertation to the examiner who shall accept it before appearing in the examination.

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ORAL AND MAXILLOFACIAL SURGERY

SUBJECT	COURSE OUTCOME
ORAL AND MAXILLOFACIAL SURGERY	**OBJECTIVES:** The training program in Oral and Maxillofacial Surgery is structured to achieve the following five objectives- • Knowledge • Skills • Attitude • Communicative skills and ability • Research **Knowledge:** • To have acquired adequate knowledge and understanding of the Etiology, pathophysiology and diagnosis, treatment planning of various common oral and Maxillofacial surgical problems both minor and major in nature • To have understood the general surgical principles like pre- and post-surgical management, particularly evaluation, post-surgical care, fluid and electrolyte management, blood transfusion and post-surgical pain management. • Understanding of basic sciences relevant to practice of oral and maxillofacial surgery • Able to identify social, cultural, economic, genetic and environmental factors and their relevance to disease process management in the oral and Maxillofacial region. • Essential knowledge of personal hygiene and infection control, prevention of cross infection and safe disposal of hospital waste keeping in view the high prevalence of hepatitis and HIV. **Skills:** • To obtain proper clinical history, methodical examination of the patient, perform essential diagnostic procedures and order relevant laboratory tests and interpret them and to arrive at a reasonable diagnosis about the surgical condition. • To perform with competence minor oral surgical procedures and common maxillofacial surgery. To treat both surgically and medically the problems of the oral and Maxillofacial and the related area. • Capable of providing care for maxillofacial surgery patients. **Attitude:** • Develop attitude to adopt ethical principles in all aspect of surgical practice, professional honesty and integrity are to be fostered. Surgical care is to be delivered irrespective of the social status, caste, creed or religion of the patient.

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• Willing to share the knowledge and clinical experience with professional colleagues.
• Willing to adopt new techniques of surgical management developed from time to time based on scientific research which are in the best interest of the patient
• Respect patient right and privileges, including patients right to information and right to seek a second opinion.
• Develop attitude to seek opinion from an allied medical and dental specialist as and when required.

Communication Skills:

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

COURSE CONTENT:

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

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

The topics are considered as under:
- A) Applied Basic sciences
B) Oral and Maxillofacial surgery
C) Allied specialties

A) Applied Basic Sciences

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

1.Surgical anatomy of the scalp, temple and face
2.Anatomy of the triangles of neck and deep structures of the neck
3.Cranial and facial bones and its surrounding soft tissues with its applied aspects in maxillofacial injuries.
4.Muscles of head and neck; chest , lower and upper extremities (in consideration to grafts/flaps)
5.Arterial supply, venous drainage and lymphatics of head and neck
6.Congenital abnormalities of the head and neck
7.Surgical anatomy of the cranial nerves
8.Anatomy of the tongue and its applied aspects
9.Surgical anatomy of the temporal and infratemporal regions
10. Anatomy and its applied aspects of salivary glands, pharynx, thyroid and parathyroid gland, larynx, trachea, esophagus
11. Tooth eruption, morphology, and occlusion.
12. Surgical anatomy of the nose
. 13. The structure and function of the brain including surgical anatomy of intra cranial venous sinuses.
14. Autonomous nervous system of head and neck
15. Functional anatomy of mastication, deglutition, speech, respiration and circulation
16. Development of face, paranasal sinuses and associated structures and their anomalies
17. TMJ: surgical anatomy and function

Physiology:

1.Nervous system
• Physiology of nerve conduction, pain pathway, sympathetic and parasympathetic nervous system, hypothalamus and mechanism of controlling body temperature
2.Blood • Composition • Haemostasis, various blood dyscrasias and management of patients with the same • Hemorrhage and its control • Capillary and lymphatic circulation. • Blood grouping, transfusing procedures.
3.Digestive system • Saliva - composition and functions of saliva • Mastication, deglutition, digestion, assimilation • Urine formation, normal and abnormal constituents
4.Respiration • Control of ventilation, anoxia, asphyxia, artificial respiration • Hypoxia – types and management
5.CardioVascular System • Cardiac cycle, • Shock • Heart sounds, • Blood Pressure • Hypertension:

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6.Endocrinology • General endocrinal activity and disorder relating to thyroid gland, • Parathyroid gland, adrenal gland, pituitary gland, pancreas and gonads: • Metabolism of calcium

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

Biochemistry:

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

Pathology:

1.Inflammation

– • Repair and regeneration, necrosis and gangrene

• Role of component system in acute inflammation, • Role of arachidonic acid and its metabolites in acute inflammation, • Growth factors in acute inflammation • Role of molecular events in cell growth and intercellular signaling cell surface receptors • Role of NSAIDs in inflammation, • Cellular changes in radiation injury and its manifestation:

2.Haemostasis

• Role of endothelium in thrombogenesis, • Arterial and venous thrombi, • Disseminated Intravascular coagulation

3.Shock: • Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock • Circulatory disturbances, ischemia, hyperemia, venous congestion, edema, infarction

4.Chromosomal abnormalities: • Marfans Syndrome, Ehler's Danlos Syndrome, Fragile X- Syndrome

5.Hypersensitivity: • Anaphylaxis, type 2 hypersensitivity, type 3 hyper sensitivity and cell mediated reaction and its clinical importance, systemic lupus erythematosus. • Infection and infective granulomas.

6.Neoplasia: • Classification of tumors. • Carcinogenesis and carcinogens-chemical, viral and microbial • Grading and staging of cancers, tumor Angiogenesis, Paraneoplastic syndrome, spread of tumors • Characteristics of benign and malignant tumors 7.Others: • Sex linked agammaglobulinemia. • AIDS• Management of immuno deficiency patients requiring surgical procedures • De George Syndrome • Ghons complex, post primary pulmonary tuberculosis – pathology and pathogenesis. Oral

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

Microbiology:

• Immunity • Knowledge of organisms commonly associated with diseases of oral cavity. • Morphology cultural characteristics of strepto, staphylo, pneumo, gono, meningo, clostridium group of organisms, spirochetes, organisms of TB, leprosy, diphtheria, actinomycosis and moniliasis • Hepatitis B and its prophylaxis • Culture and sensitivity test • Laboratory determinations • Blood groups, blood matching, RBC and WBC count • Bleeding and clotting time etc, smears and cultures, • Urine analysis and cultures. Applied Pharmacology and Therapeutics: 1. Definition of terminologies used 2. Dosage and mode of administration of drugs. 3. Action and fate of drugs in the body 4. Drug addiction, tolerance and hypersensitivity reactions. 5. Drugs acting on the CNS 6. General and local anesthetics, hypnotics, analeptics, and tranquilizers. 7. Chemo therapeutics and antibiotics 8. Analgesics and antipyretics 9. Antitubercular and antisyphilitic drugs. 10. Antiseptics, sialogogues and antisialogogues 11. Haematinics 12. Antidiabetics 13. Vitamins A, B-complex, C, D, E, K

C) **Oral and Maxillofacial Surgery:**

• Evolution of Maxillofacial surgery. • Diagnosis, history taking, clinical examination, investigations. • Informed consent/medico-legal issues. • Concept of essential drugs and rational use of drugs.• Communication skills with patients- understanding, clarity in communication, compassionate explanations and giving emotional support at the time of suffering and bereavement • Principles of surgical audit – understanding the audit of process and outcome. Methods adopted for the same. Basic statistics. • Principles of evidence based surgery- understanding journal based literature study; the value of textbook, reference book articles, value of review articles; original articles and their critical assessment, understanding the value of retrospective, prospective, randomized control and blinded studies, understanding the principles and the meaning of various Bio-statistical tests applied in these studies. • Principles of surgery- developing a surgical diagnosis, basic necessities for surgery, aseptic technique, incisions, flap designs, tissue handling, hemostasis, dead space management, decontamination and debridement, suturing, edema control, patient general health and nutrition. • Medical emergencies – Prevention and management of altered consciousness, hyper sensitivity reaction, chest discomfort, respiratory difficulty. • Pre operative workup – Concept

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	of fitness for surgery; basic medical work up; work up in special situation like diabetes, renal failure, cardiac and respiratory illness; risk stratification • Surgical sutures, drains • Post operative care- concept of recovery room care, Airway management, Assessment of Wakefulness, management of cardio vascular instability in this period, Criteria for shifting to the ward, pain management • Wound management- Wound healing, factors influencing healing, basic surgical techniques, Properties of suture materials, appropriate use of sutures. • Surgical Infections – Asepsis and antisepsis, Microbiological principles, Rational use of antibiotics, special infections like Synergistic Gangrene and Diabetic foot infection, Hepatitis and HIV infection and cross infection. • Airway obstruction/management – Anatomy of the airway, principles of keeping the airway patent, mouth to mouth resuscitation, Oropharyngeal airway, endotracheal intubation, Cricothyroidectomy, Tracheostomy. • Anesthesia – stages of Anesthesia, pharmacology of inhalation, intravenous and regional anesthetics, muscle relaxants. • Facial pain; Facial palsy and nerve injuries. • Pain control – acute and chronic pain, cancer and non-cancer pain, patient controlled analgesia • General patient management – competence in physical assessment of patients of surgery, competence in evaluation of patients presenting with acute injury, particularly to maxillofacial region. Competence in the evaluation of management of patients for Anesthesia • Clinical oral surgery – all aspects of dento alveolar surgery • Pre-prosthetic surgery – A wide range of surgical reconstructive procedures involving their hard and soft tissues of the edentulous jaws. • Temporomandibular joint disorders – TMJ disorders and their sequelae need expert evaluation, assessment and management. It is preferable to be familiar with diagnostic and therapeutic arthroscopic surgery procedures. • Tissue grafting – Understanding of the biological mechanisms involved in autogenous and heterogeneous tissue grafting. • Reconstructive oral and maxillofacial surgery – hard tissue and soft tissue reconstruction. • Cyst and tumors of head and neck region and their management – including principles of tumor surgery, giant cell lesion of jaw bones, fibro osseous lesions of jaw.• Neurological disorders of maxillofacial region-diagnosis and management of Trigeminal Neuralgia, MPDS, Bells palsy, Frey's Syndrome, Nerve injuries • Maxillofacial trauma – basic principles of treatment, primary care, diagnosis and management of hard and soft tissue injuries, Comprehensive management including polytrauma patients • Assessment of trauma-multiple injuries patient, closed abdominal and chest injuries, penetrating injuries, pelvic fractures, urological injuries, vascular injuries. • Orthognathic surgery – The trainee must be familiar with the assessment and correcting of jaw deformities • Laser surgery – The application of laser technology in the surgical treatment of lesions amenable to such therapy • Distraction osteogenesis in maxillofacial region. • Cryosurgeries – Principles, the application of cryosurgery in the surgical management of lesions amenable to such surgeries. • Cleft lip and palate surgery- detailed knowledge of the development of the face, head and neck, diagnosis and treatment planning, Current concepts in the management of cleft lip and palate deformity, knowledge of nasal endoscopy and other diagnostic techniques in the evaluation of speech and hearing, concept of multi disciplinary team management • Aesthetic facial surgery – detailed

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knowledge of structures of face & neck including skin and underlying soft tissues, diagnosis and treatment planning of deformities and conditions affecting facial skin, underlying facial muscles, bone, eyelids, external ear etc., surgical management of post acne scaring, face lift, blepharoplasty, otoplasty, facial bone recountouring etc. • Craniofacial surgery – basic knowledge of developmental anomalies of face, head and neck, basics concept in the diagnosis and planning of various head and neck anomalies including facial cleft, craniosynostosis, syndromes, etc., Current concepts in the management of craniofacial anomalies. • Head and neck oncology – understanding of the principles of management of head and neck oncology including various pre cancerous lesions, Experience in the surgical techniques of reconstruction following ablative surgery. • Micro vascular surgery. • Implantology – principles, surgical procedures for insertion of various types of implants. • Maxillofacial radiology/ radio diagnosis • Other diagnostic methods and imaging techniques C) Allied Specialties: • General medicine: General assessment of the patient including children with special emphasis on cardiovascular diseases, endocrinal, metabolic respiratory and renal diseases, Blood dyscrasias • General surgery: Principles of general surgery, exposure to common general surgical procedures. • Neuro – surgery: Evaluation of a patient with head injury, knowledge & exposure of various Neuro – surgical procedures • ENT/Ophthalmology: Examination of ear, nose, throat, exposure to ENT surgical procedures, ophthalmic examination and evaluation, exposure to ophthalmic surgical procedures. • Orthopedic: basic principles of orthopedic surgery, bone diseases and trauma as relevant to Maxillofacial surgery, interpretation of radiographs, CT, MRI and ultrasound• Anesthesiology: Evaluation of patients for GA technique, general anesthetic drugs use and complications, management of emergencies, various IV sedation techniques. • Plastic Surgery- Basic Principles

Training in Research Methodology, Biostatistics, Ethics / Bioethics in Dentistry, Jurisprudence and Audits Training in Research Methodology:

All MDS candidates shall compulsorily attend the Research Methodology Workshop conducted by the University within 6 months from the date of joining the course. In this regard, the candidates will be issued a completion Certificate by the University.

TEACHING LEARNING METHODS (including Clinical Study)

(a) LECTURES:

There shall be some didactic lectures in the speciality and in the allied fields. The departments shall encourage guest lectures in the required areas and integrated lectures by multi-disciplinary teams on selected topics, to strengthen the training programmes.

(b) JOURNAL REVIEW: The journal review meetings shall be held at least once a week. All trainees, associate and staff associated with the post-graduate programme are expected to participate actively

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and enter relevant details in the logbook. The trainee shall make presentations from the allotted journals of selected articles.

(b) SEMINARS: The seminars shall be held at least twice a week in each department. All trainees are expected to participate actively and enter relevant details in logbook.

(d) SYMPOSIUM: It is recommended to hold symposium on topics covering multiple disciplines.

(e) CLINICAL POSTINGS: Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases.

(f) CLINICO-PATHOLOGICAL CONFERENCE: The clinico pathological conference shall be held once a month involving the faculties of Oral Medicine and Radiology, Oral Pathology and allied clinical departments. The trainees shall be encouraged to present the clinical details, radiological and histo-pathological interpretations and participation in the discussions.

(g) INTER-DEPARTMENTAL MEETINGS: To encourage integration among various specialities, there shall be interdepartmental meeting chaired by the Dean with all heads of post-graduate departments at least once a month.

(h) TEACHING SKILLS: All the trainees shall be encourages to take part in undergraduate teaching programmes either in the form of lectures or group discussion.

(i) DENTAL EDUCATION PROGRAMMES: Each department shall organise dental education programmes on regular basis involving other institutions. The trainees shall also be encouraged to attend such programmes conducted outside their university or institute.

(j) CONFERENCES/WORKSHOPS/ADVANCED COURSES: The trainees shall be encouraged to attend conference/workshops/advanced courses and also to present at least two scientific papers and two posters at State/national level speciality and allied conferences/conventions during the training period.

(k) ROTATION AND POSTING IN OTHER DEPARTMENTS: To bring in more integration among the specialities and allied fields, each department shall workout a programme to rotate the trainees in related disciplines.

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COURSE YEAR	TEACHING / LEARNING ACTIVITIES:
I YEAR M.D.S.	Study of applied basic sciences including practical (wherever necessary), basic computer sciences, exodontia, seminars on basic topics, selection of dissertation topic, library assignment topic, attending O.T, ward rounds, Medical Record keeping, Pre-clinical exercises, preparation of synopsis and its submission within the six months after admission to the university as per calendar of events. **Rotation and postings in other departments:** General medicine - 1 month General surgery - 1 month Ophthalmology - 15 days Neuro Surgery - 15 days ENT - 15 days Orthopedic - 15 days Plastic Surgery - 15 days Casualty - 1 month Anesthesia (ICU) - 15 days Radiology (CT, MRI, USG) - 15 days
II YEAR M.D.S.	• Minor oral surgery and higher surgical training • Submission of library assignment • Oncology - 2 months
III YEAR M.D.S	• Maxillofacial surgery • Submission of dissertation to the university, six months before the final examination.
	Monitoring Learning Progress: It is essential to monitor the learning progress to each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects. Checklists are given in Section **IV. DISSERTATION**

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		Every candidate appearing for the post-graduate degree examination shall at least six months prior to the examinations, submit with his form for examination, four typewritten copies of the dissertation undertaken by the candidate, prepared under the direction and guidance of his/her guide. It must be approved by the Institutional Review Board consisting of Principal, all the HOD's, an advocate, medical specialties and social worker within the first six months after the commencement of the course. The application for registration of dissertation topic must be sent through the Principal duly forwarded by the Professor/ HOD. The University will register such dissertation topic. In case the students want to change the topic of dissertation, they can do it within the next three months. No change in the Guide/dissertation topic shall be made without prior approval of the University. The aim of dissertation is to train a postgraduate student in research methodology. It includes identification of a problem with recent advances, designing of research study on collection of data, practical analysis and comparison of results and drawing conclusions. The dissertation should be written under the following headings. Introduction /Aims and objective/Review and lierature / Material & Methods/Results/Discussion **Conclusion Summary** The written text of dissertation shall not be less than 100pages. It should be neatly typed in double line spacing on one side (A4 size, 8. 27"x 11.69") and bounded properly. Photos, charts, tables, tables and graphs can be attached where ever necessary. Spiral binding should not be used. The dissertation shall be certified by the Guide and Head of the department and forwarded by the Principal to the University. The dissertation so submitted shall be referred to the examiners for their examination and acceptance of it shall be a condition precedent to allow the candidate to appear for the written

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part of the examination. Provided that a candidate whose dissertation has been accepted by the examiner, but declared failed at the examination, shall be permitted to re-appear at the subsequent examination without a new dissertation.

Provided further that if the dissertation is rejected by the examiner, the examiner shall assign reasons thereof with suggestions for its improvement to the candidate and such candidate shall re-submit his/ her dissertation to the examiner who shall accept it before appearing in the examination.

Paper wise distribution of syllabus:

PART- I :

Applied Basic Sciences

PART-II:

Paper– I:Minor Oral Surgery and Maxillofacial Trauma Minor Oral Surgery:

• Principles of Surgery: Developing A Surgical Diagnosis, Basic Necessities For Surgery, Aseptic Technique, Incisions, Flap Design Tissue Handling, Haemostasis, Dead Space Management, Decontamination And Debridement, Suturing, Oedema Control, Patient General Health And Nutrition. • Medical Emergencies: Prevention and management of altered cons-ciousness (syncope, orthostatic hypotension, seizures, diabetes mellitus, adrenal insufficiency), hypersensitivity reactions, chest discomfort, and respiratory difficulty. • Examination and Diagnosis: Clinical history, physical and radiographic, clinical and laboratory diagnosis, oral manifestations of systemic diseases, implications of systemic diseases in surgical patients. • Haemorrhage and Shock: Applied physiology, clinical abnormalities of coagulation, extra vascular hemorrhage, and hemorrhagic lesions, management of secondary hemorrhage, shock. • Exodontia: Principles of extraction, indications and contraindications, types of extraction,

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		complications and their management, principles of elevators and elevators used in oral surgery. • Impaction: Surgical anatomy, classification, indications and contraindications, diagnosis, procedures, complications and their management. • Surgical aids to eruption of teeth: Surgical exposure of unerupted teeth, surgical repositioning of partially erupted teeth. • Transplantation of teetH • Surgical Endodontics: Indications and contraindications, diagnosis, procedures of periradicular surgery • Preprosthetic Surgery: Requirements, types (alvoloplasty, tuberosity reduction, mylohyoid ridge reduction, genial reduction, removal of exostosis, vestibuloplasty) • Procedures to Improve Alveolar Soft Tissues: Hypermobile tissues- operative / sclerosing method, epulis fissuratum, frenectomy and frenotomy • Infectionsof Head and Neck: Odontogenic and non Odontogenic infections, factors affecting spread of infection, diagnosis and differential diagnosis, management of facial space infections, Ludwig angina, cavernous sinus thrombosis. • Chronic infections of the jaws: Osteomyelitis (types, etiology, pathogenesis, management) osteoradionecrosis• Maxillary Sinus: Maxillary sinusitis – types, pathology, treatment, closure of Oro – antral fistula, Caldwell- luc operation • Cysts of the Orofacial Region: Classification, diagnosis, management of OKC, dentigerous, radicular, non Odontogenic, ranula • Neurological disorders of the Maxillofacial Region: Diagnosis and management of trigeminal neuralgia, MPDS, bell's palsy, Frey's syndrome, nerve injuries. • Implantology: Definition, classification, indications and contraindications, advantages and disadvantages, surgical procedure. **• Anesthesia** Local Anesthesia: Classification of local anesthetic drugs, mode of action, indications and contra indications, advantages and disadvantages, techniques, complications and their management. **General Anesthesia:** Classification, stages of GA, mechanism of action, indications, and contra indications,

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

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		a) Salivary gland • Sialography • Salivary fistula and management • Diseases of salivary gland – developmental disturbances, cysts, inflammation and sialolithiasis • Mucocele and Ranula • Tumors of salivary gland and their management • Staging of salivary gland tumors • Parotidectomy b) Temporomandibular Joint • Etiology, history signs, symptoms, examination and diagnosis of temporomandibular joint disorders • Ankylosis and management of the same with different treatment modalities • MPDS and management • Condylectomy – different procedures • Various approaches to TMJ • Recurrent dislocations – Etiology and Management c) Oncology • Biopsy • Management of pre-malignant tumors of head and neck region • Benign and Malignant tumors of Head and Neck region • Staging of oral cancer and tumor markers • Management of oral cancer • Radical Neck dissection • Modes of spread of tumors • Diagnosis and management of tumors of nasal, paranasal, neck, tongue, cheek, maxilla and mandible • Radiation therapy in maxillofacial regions • Lateral neck swellings d) Orthognathic surgery • Diagnosis and treatment planning • Cephalometric analysis • Model surgery • Maxillary and mandibular repositioning procedures • Segmental osteotomies • Management of apertognathia • Genioplasty • Distraction osteogenesis e) Cysts and tumors of oro facial region • Odontogenic and non-Odontogenic tumors and their management • Giant Cell lesions of jawbone• Fibro osseous lesions of jawbone • Cysts of jaw f) Laser surgery • The application of laser technology in surgical treatment of lesions g) Cryosurgery • Principles, applications of cryosurgery in surgical management h) Cleft lip and palate surgery • Detailed knowledge of the development of the face, head and neck • Diagnosis and treatment planning • Current concepts in the management of cleft lip and palate deformity • Knowledge of

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		Naso endoscopy and other diagnostic techniques in the evaluation of speech and hearing • Concept of multidisciplinary team management i) Aesthetic facial surgery • Detailed knowledge of the structures of the face and neck including skin and underlying soft tissue • Diagnosis and treatment planning of deformities and conditions affecting facial skin • Underlying facial muscles, bone, Eyelids, external ear • Surgical management of post acne scarring, facelift, blepharoplasty, otoplasty, facial bone recontouring, etc j) Craniofacial surgery • Basic knowledge of developmental anomalies of the face, head and neck • Basic concepts in the diagnosis and planning of various head and neck anomalies including facial clefts, craniosynostosis, syndromes, etc. • Current concept in the management of Craniofacial anomalies ii) **Paper – III : Essays (descriptive and analyzing type questions)**

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CONSERVATIVE DENTISTRY AND ENDODONTICS

SUBJECT	COURSE OUTCOME
CONSERVATIVE DENTISTRY AND ENDODONTICS	**OBJECTIVES:** The following objectives are laid out to achieve the goals of the course. These are to be achieved by the time the candidate completes the course. These objectives may be considered under the following subtitles. **Knowledge:** At the end of 36 months of training, the candidates should be able to: • Describe aetiology, pathophysiology, periapical diagnosis and management of common restorative situations, endodontic situations that will include contemporary management of dental caries, management of trauma and pulpal pathosis including periodontal situations. • Demonstrate understanding of basic sciences as relevant to conservative / restorative dentistry and Endodontics. • Identify social, economic, environmental and emotional determinants in a given case or community and take them into account for planning and execution at individual and community level. • Ability to master differential diagnosis and recognize conditions that may require multi-disciplinary approach or a clinical situation outside the realm of the specialty, which he or she should be able to recognize and refer to appropriate specialist. • Update himself by self-study and by attending basic and advanced courses, conferences, seminars, and workshops in the specialty of Conservative Dentistry-Endodontics-Dental Materials and Restorative Dentistry. • Ability to teach/guide, colleagues and other students. Use information technology tools and carry out research both basic and clinical with the aim of his publishing his work and presenting the same at scientific platform. **Skills:** • Take proper chair side history, examine the patient and perform medical and dental diagnostic procedures as well as perform relevant tests and interpret to them to come to a reasonable diagnosis about the dental condition in general and Conservative Dentistry – Endodontics in particular. And undertake complete patient monitoring including preoperative as well as post-operative care of the patient. • Perform all levels of restorative work, surgical and non-surgical Endodontics as well as endodontic-periodontal surgical procedures as part of multidisciplinary approach to clinical condition. • Provide basic lifesaving support in emergency situations. • Manage acute pulpal and pulpo-periodontal situations. • Have a thorough knowledge of infection control measures in the dental clinical

environment and laboratories.
• Should have proper knowledge of sterilization procedures

Human Values, Ethical Practice and Communication Abilities

• Adopt ethical principles in all aspects of restorative and contemporary Endodontics including non-surgical and surgical Endodontics.
• Professional honesty and integrity should be the top priority.
• Dental care has to be provided regardless of social status, caste, creed or religion of the patient.
• Develop communication skills in particular to explain various options available for management and to obtain a true informed consent from the patient.
• Apply high moral and ethical standards while carrying on human or animal research.
• He/She shall not carry out any heroic procedures and must know his limitations in performing all aspects of restorative dentistry including Endodontics. Ask for help from colleagues or seniors when required without hesitation.
• Respect patient's rights and privileges including patients right to information.

COURSE CONTENTS:

PART-I:

Applied Basic Sciences: Applied Anatomy of Head and Neck:

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

Anatomy and Development of Teeth:

• Enamel – development and composition, physical characteristics, chemical properties, structure.
• Age changes – clinical structure.
• Dentin – development, physical and chemical properties, structure type of dentin, innervations, age and functional changes and clinical considerations.
• Pulp – development, histological structures, innervations, functions, regressive changes, clinical considerations.

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	• Dentin and pulp complex. • Cementum – composition, cementogenesis, structure, function, clinical considerations. • Knowledge of internal anatomy of permanent teeth, anatomy of root apex and its implications in endodontic treatment. • Periodontal ligament – development, structure, function and clinical considerations. • Salivary glands – structure, function, clinical considerations. I Eruption of teeth **Applied Physiology:** • Mastication, deglutition, digestion and assimilation, fluid and electrolyte balance. • Blood composition, volume, function, blood groups, haemostasis, coagulation, blood transfusion, circulation, heart, pulse, blood pressure, shock, respiration-control, anoxia, hypoxia, asphyxia, artificial respiration, and endocrinology – general principles of endocrine activity and disorders relating to pituitary, thyroid, parathyroid, adrenals including pregnancy and lactation. • Physiology of saliva – composition, function, clinical significance. • Clinical significance of vitamins, diet and nutrition – balanced diet. • Physiology of pain, sympathetic and Para sympathetic nervous system, pain pathways, physiology of pulpal pain, Odontogenic and non Odontogenic pain, pain disorders – typical and atypical. • Biochemistry such as osmotic pressure, electrolytic dissociation, oxidation, reduction etc. Carbohydrates, proteins, lipids and their metabolism, nucleoproteins, nucleic acid andtheir metabolism. Enzymes, vitamins and minerals, metabolism of inorganic elements, detoxification in the body, anti metabolites, chemistry of blood lymph and urine. **Pathology:** • Inflammation, repair, degeneration, necrosis and gangrene. • Circulatory disturbances – ischemia, hyperemia, edema, thrombosis, embolism, infarction, allergy and hypersensitivity reaction. • Neoplasms – classifications of tumors, characteristics of benign and malignant tumors, spread of tumors. • Blood dyscrasias. • Developmental disturbances of oral and Para oral structures, dental caries, regressive changes of teeth, pulp, periapical pathology, pulp reaction to dental caries and dental procedures. • Bacterial, viral, mycotic infections of the oral cavity. **Microbiology:** • Pathways of pulpal infection, oral flora and micro organisms associated with endodontic diseases, pathogenesis, host defense, bacterial virulence factors, healing, theory of focal infections, microbes relevance to dentistry – strepto, staphylococci, lactobacilli, corynebacterium, actinomycetes,

clostridium, neisseria, vibrio, bacteriods, fusobacteria, spirochetes, mycobacterium, virus and fungi. • Cross infection, infection control, infection control procedure, sterilization and disinfection. • Immunology – antigen antibody reaction, allergy, hypersensitivity and anaphylaxis, auto immunity, grafts, viral hepatitis, HIV infections and aids. Identification and isolation of microorganisms from infected root canals. Culture medium and culturing technique (Aerobic and anaerobic interpretation and antibiotic sensitivity test). Pharmacology: • Dosage and route of administration of drugs, actions and fate of drug in body, drug addiction, tolerance of hypersensitivity reactions. • Local anesthesia – agents and chemistry, pharmacological actions, fate and metabolism of anaesthetic, ideal properties, techniques and complications. • General anesthesia – pre medications, neuro muscular blocking agents, induction agents, inhalation anesthesia, and agents used, assessment of anesthetic problems in medically compromised patients.

• Anaesthetic emergencies

• Antihistamines, corticosteroids, chemotherapeutic and antibiotics, drug resistance, haemostasis, and haemostatic agents, anticoagulants, sympathomimitic drugs, vitamins and minerals (A, B, C, D, E, K IRON), anti sialogogue, immunosupressants, drug interactions, antiseptics, disinfectants, anti viral agents, drugs acting on CNS.

Biostatistics:

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

Research Methodology:

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

Applied Dental Materials:

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

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Training in Research Methodology, Biostatistics, Ethics / Bioethics, in Dentistry, Jurisprudence and Audits:

- Respect human life and the dignity of human individual
- Refrain from supporting or committing crimes against humanity and condemn all such acts
- Treat the sick and injured with competence and compassion
- Protect the privacy and confidentiality of those whom we care.
- Work freely with colleagues
- Educate the public
- Teach and mentor those who follow us

All MDS candidates shall compulsorily attend the Research Methodology Workshop conducted by the University within 6 months from the date of joining the course.
In this regard, the candidates will be issued a completion Certificate by the University.

PART-II:

Paper-I: Conservative Dentistry

1. Examination, diagnosis and treatment plan
2. Occlusion as related to conservative dentistry, contact, contour, its significance. Separation of teeth, matrices, used in conservative dentistry.
3. Dental caries- epidemiology, recent concept of etiological factors, pathophysiology, histopathology, diagnosis, caries activity tests, prevention of dental caries and management – recent methods.
4. Hand and rotary cutting instruments, development of rotary equipment, speed ranges, hazards.
5. Dental burs and other modalities of tooth reparation- recent developments (air abrasions, lasers etc.)
6. Infection control procedures in conservative dentistry, isolation equipments etc.
7. Direct concepts in tooth preparation for amalgam, composite, GIC and restorative techniques, failures and management.
8. Biologic response of pulp to various restorative materials and operative procedures.
9. Direct and indirect composite restorations.
10. Indirect tooth colored restorations- ceramic, inlays and onlays, veneers, crowns, recent advances in fabrication and gingival tissue management.
11. Impression procedures used for indirect restorations.
12. Cast metal restorations, indications, contraindications, tooth preparation for class II inlay, onlay, full crown restorations.Restorative

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techniques, direct and indirect methods of fabrication including materials used for fabrication like inlay wax, investment materials and casting.
13. Direct gold restorations.
14. Recent advances in restorative materials.
15. Esthetics including smile design
16. Management of non-carious lesions.
17. Management of discolored tooth
18. Minimal intervention dentistry.
19. Recent advances in restoration of endodontically treated teeth and grossly mutilated teeth.
20. Hypersensitivity-theories, causes and management.
21. Lasers in Conservative Dentistry.
22. CAD-CAM in restorative dentistry.
23. Digital imaging and its applications in restorative dentistry.
24. Clinical Photography.
25. Principles of esthetics.

l Color
l Facial analysis
l Smile design
l Principles of esthetic integration
l Treatment planning in esthetic dentistry

Paper-II: Endodontics

1. Rationale of endodontics.
2.Knowledge of internal anatomy of permanent teeth, anatomy of root apex and its implications in endodontic treatment
. 3.Dentin and pulp comple
x 4.Pulp and periapical pathology.

5.Pathobiology of periapex.
6.Diagnostic procedures – Orofacial dental pain emergencies: endodontic diagnosis and management, recent advances used for diagnosis.
7.Case selection and treatment planning.
8.Endodontic microbiology.
9.Infection control procedures used in Endodontics (aseptic techniques such as rubber dam, sterilization of instruments etc.)
10. Endodontic emergencies and management.
11. Access cavity preparation – objectives and principles
12. Endodontic instruments and instrumentation – recent developments, detailed description of hand, rotary, sonic, ultra sonic etc.
13. Working length determination, cleaning and shaping of root canal system and recent developments in techniques of canal preparation.
14. Root canal irrigants and intra canal medicaments.
15. Obturation materials, techniques and recent advances.
16. Traumatic injuries and management – endodontic treatment for young permanent teeth.
17. Endodontic surgeries, recent developments in technique and devices and wound healing.
18. Endoperio interrelationship and management.

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19. Lasers in Endodontics.
20. Multidisciplinary approach to endodontic situations.
21. Radiology and CBCT in endodontic practice.
22. Procedural errors in endodontics and their management.
23. Endodontic failures and retreatment.
24. Resorptions and its management.
25. Microscopes and Microsurgery in endodontics.
26. Single visit endodontics, current concepts and controversies.
27. Regenerative Endodontics
28. Geriatric Endodontics
29. Biologic response of pulp to various restorative materials and operative procedures
30. Local anesthesia in endodontics.
31. Restoration of endodontically treated teeth, recent advances
32. Effect of age and systemic health endodontics, with emphasis on treatment of medically complex endodontic patient.
33. Rhinosinusitis and endodontic disease
34. Vital pulp therapy
35. Records and legal responsibilities
36. Inflammation and immunology in endodontics
37. Non microbial endodontic disease
38. Pulpal reaction to caries and endodontic procedures
39. Bleaching principles
40. Outcome of endodontic treatment
41. Cracks and fracture

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

COURSE YEAR	**TEACHING / LEARNING ACTIVITIES:**
I YEAR M.D.S.	**•Pre Clinical Work – Conservative and Endodontics** **•Preclinical work on typhodont teeth** 1. Class II amalgam cavities a. Conservative preparation - 03 b. Conventional preparation - 03 2. Inlay cavity preparation including wax pattern and casting on premolars and molars – MO, DO, MOD - 02 3. Onlay preparation on molars including wax pattern and casting - 02 4. Full Crown a. Anterior - 02 b. Posterior – 02 (1 each to be processed) 5. 7/8 crown – 02 (1 to be processed) 6. 3 / 4 crown premolar – 02 (1 to be processed) **• Pre Clinical work on natural teeth** 1. Wax Carving of all permanent teeth 2. Inlay on molars and premolars MO, DO, and MOD including wax pattern and casting - 05 3. Amalgam cavity preparation

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a. Conventional - 02
b. Conservative - 02

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

Endodontics:

1. Sectioning of all maxillary and mandibular teeth (vertical & horizontal).
2. Access cavity opening in relation to maxillary and mandibular permanent teeth.
3. Access cavity preparation, BMP and Obturation
   a) Anterior (3 maxillary and 3 mandibular) - 06
      - Conventional prep - 02
      - Step back - 02
      - Crown down - 02
      - Obturation - 03 (2 lateral compaction and 1 thermoplasticized)

   b) Premolar – 04 (2 upper and 2 lower) obturation 1 each

   c) Molar – 06 (3 upper – 2 first molars and 1 second molar 3 lower – 2 first molars and 1 second molar) obturation 1 each
4. Post and core preparation and fabrication in relation to anterior and posterior teeth
   a. Anterior 10 (Cast Post 5 and prefabricated post 5)
   b. Posterior 05 (Cast Post 2 and prefabricated post 5)
5. Removable dies - 04

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

Clinical Work:

Amalgam (Cl II MO/DO/MOD)	30
Composite restorations	30
GIC Restorations	30
Complex amalgam restorations	05
Composite inlay + veneers (direct and indirect)	10

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		Ceramic jacket crowns		05
		Post and core for anterior teeth		10
		Bleaching	vital	05
			Non vital	05
		RCT Anterior		20
		Endo surgery – observation and assisting		05
		Presentation of: • Seminars – 5 seminars by each student – should include topics in dental materials, conservative dentistry and endodontics • Journal clubs – 5 by each student • Submission of synopsis at the end of 6 months • Library assignment work • Internal assessment – theory and clinicals.		
	II YEAR M.D.S.	Case discussion- 5		
		Ceramic jacket crowns		10
		Post and core for anterior teeth		10
		Post and core for posterior teeth		05
		Composite restoration		15
		Full crown for posterior teeth		15
		Cast gold inlay		05
		Other special types of work such as splinting Reattachment of fractured teeth etc.		10
		Anterior RCT		30
		Posterior RCT		40
		Endo surgery performed independently		05
		Management of endo – Perio problems		05
		Angle build up composite		05
		Diastema closure		05
		Composite Veneers		05
		• Under graduate teaching program as allotted by the HOD • Seminars – 5 by each student • Journal club – 5 by each student • Dissertation work • Prepare scientific paper / poster and present in conference and clinical meeting • Library assignment to be submitted 18 months after starting of the course • Internal assessment – theory and clinical		
	III YEAR M.D.S	Dissertation work to be submitted 6 months before final examination. **Clinical work** Cast gold inlay- Onlay, cuspal restoration Post and core Molar endodontics Endo surgery Diastema Closure		10 20 50 05 05

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		Angle Build up 05 • All other types of surgeries including crown lengthening, perioesthetics, hemi sectioning, splinting, replantation. **Presentation of:** • Seminars – 5 by each student • Journal club – 5 by each student • Under graduate teaching program as allotted by the HOD - 1/year • Internal assessment – theory and clinical • Clinical Case Discussion – 5/year • Scientific Publication – 1(during the M.D.S course) • Scientific Presentations - 4(during the M.D.S course with a minimum of 2 papers) • Specialty Conferences and/or PG Conventions attended - 3(during the M.D.S course)

The teaching and learning activities in each speciality shall be as under

(a) LECTURES:

There shall be some didactic lectures in the speciality and in the allied fields. The departments shall encourage guest lectures in the required areas and integrated lectures by multi-disciplinary teams on selected topics, to strengthen the training programmes.

(b) JOURNAL REVIEW: The journal review meetings shall be held at least once a week. All trainees, associate and staff associated with the post-graduate programme are expected to participate actively and enter relevant details in the logbook. The trainee shall make presentations from the allotted journals of selected articles.

(c) SEMINARS: The seminars shall be held at least twice a week in each department. All trainees are expected to participate actively and enter relevant details in logbook.

(d) SYMPOSIUM: It is recommended to hold symposium on topics covering multiple disciplines.

(e) CLINICAL POSTINGS: Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases.

(f) CLINICO-PATHOLOGICAL CONFERENCE:The clinico pathological conference shall be held once a month involving the faculties of Oral Medicine and Radiology, Oral Pathology and allied clinical departments. The trainees shall be encouraged to present the clinical details, radiological and histopathological interpretations and participation in the discussions.

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(g) INTER-DEPARTMENTAL MEETINGS: To encourage integration among various specialities, there shall be inter-departmental meeting chaired by the Dean with all heads of post-graduate departments at least once a month.

(h) TEACHING SKILLS: All the trainees shall be encourages to take part in undergraduate teaching programmes either in the form of lectures or group discussion.

(i) DENTAL EDUCATION PROGRAMMES: Each department shall organise dental education programmes on regular basis involving other institutions. The trainees shall also be encouraged to attend such programmes conducted outside their university or institute.

(j) CONFERENCES/WORKSHOPS/ADVANCED COURSES: The trainees shall be encouraged to attend conference/workshops/advanced courses and also to present at least two scientific papers and two posters at State/national level speciality and allied conferences/conventions during the training period.

(k) ROTATION AND POSTING IN OTHER DEPARTMENTS: To bring in more integration among the specialities and allied fields, each department shall workout a programme to rotate the trainees in related disciplines.

DISSERTATION

Every candidate appearing for the post-graduate degree examination shall at least six months prior to the examinations, submit with his form for examination, four typewritten copies of the dissertation undertaken by the candidate, prepared under the direction and guidance of his/her guide.

It must be approved by the Institutional Review Board consisting of Principal, all the HOD's, an advocate, medical specialties and social worker within the first six months after the commencement of the course. The application for registration of dissertation topic must be sent through the Principal duly forwarded by the Professor/ HOD. The University will register such dissertation topic. In case the students want to change the topic of dissertation, they cando it within the next three months. No change in the Guide/dissertation topic shall be made without prior approval of the University.

The aim of dissertation is to train a postgraduate student in research methodology. It includes identification of a problem with recent advances, designing of research study on collection of data, practical analysis and comparison of results and drawing conclusions.

The dissertation should be written under the following headings.

Introduction / Aims and objective / Review and literature / Materials & Methods / Results / Discussion

Conclusion / Summary

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	The written text of dissertation shall not be less than 100pages. It should be neatly typed in double line spacing on one side (A4 size, 8. 27"x 11.69") and bounded properly. Photos, charts, tables, tables and graphs can be attached where ever necessary. Spiral binding should not be used. The dissertation shall be certified by the Guide and Head of the department and forwarded by the Principal to the University. The dissertation so submitted shall be referred to the examiners for their examination and acceptance of it shall be a condition precedent to allow the candidate to appear for the written part of the examination. Provided that a candidate whose dissertation has been accepted by the examiner, but declared failed at the examination, shall be permitted to re-appear at the subsequent examination without a new dissertation. Provided further that if the dissertation is rejected by the examiner, the examiner shall assign reasons thereof with suggestions for its improvement to the candidate and such candidate shall re-submit his/ her dissertation to the examiner who shall accept it before appearing in the examination.

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ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS

ORTHODONTICS AND DENTOFACIAL ORTHOPAEDICS

SUBJECT	COURSE OUTCOME
ORTHODONTICS AND DENTOFACIAL ORTHOPEDICS	**OBJECTIVES:** The training programme in Orthodontics is to structure and achieve the following four objectives **Knowledge:** 1. The dynamic interaction of biologic processes and mechanical forces acting on the stomatognathic system during orthodontic treatment 2. The etiology, pathophysiology, diagnosis and treatment planning of various common Orthodontic problems 3. Various treatment modalities in Orthodontics – preventive, interceptive and corrective. 4. Basic sciences relevant to the practice of Orthodontics 5. Interaction of social, cultural, economic, genetic and environmental factors and their relevance to management of oro – facial deformities 6. Factors affecting the long-range stability of orthodontic correction and their management 7. Personal hygiene and infection control, prevention of cross infection and safe disposal of hospital waste, keeping in view the high prevalence of Hepatitis and HIV and other highly contagious diseases. **Skills:** 1. To obtain proper clinical history, methodical examination of the patient, perform essential diagnostic procedures, and interpret them and arrive at a reasonable diagnosis about the Dento-facial deformities. 2. To be competent to fabricate and manage the most appropriate appliance – intra or extra oral, removable or fixed, mechanical or functional, and active or passive – for the treatment of any orthodontic problem to be treated singly or as a part of multidisciplinary treatment of oro-facial deformities. **Attitude:** 1. Develop an attitude to adopt ethical principles in all aspects of Orthodontic practice. 2. Professional honesty and integrity are to be fostered 3. Treatment care is to be delivered irrespective of the social status, cast, creed and religion of the patients. 4. Willingness to share the knowledge and clinical experience with professional colleagues 5. Willingness to adopt, after a critical assessment, new methods and techniques of orthodontic management developed from time to time based on scientific research, which are in the best interest of the patient 6. Respect patients' rights and privileges, including patients right to information and right to seek a second opinion

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7. Develop attitude to seek opinion from allied medical and dental specialists as and when required

Communication Skills:

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

COURSE CONTENT:

(components of post graduate curriculum)

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

Theoretical knowledge:

All the teaching faculty and especially Professors should actively take part in imparting clinical, theoretical knowledge to each of the student. The students can be posted on rotation under each Professor and also have their clinical cases guided equally by all of them. The Associate Professors shall also discuss and guide / co – guide the students if they have adequate teaching experience

Spread of the Curriculum:

PART-I:

A. **Applied Basic Sciences:**

B. Applied Anatomy:

C. a. Prenatal growth of head:

D. Stages of embryonic development, origin of head, origin of face, origin of teeth

. b. Postnatal growth of head: Bones of skull, the oral cavity, development of chin, the hyoid bone, general growth of head, growth of the face.

c. Bone growth: Origin of bone, composition of bone, units of bone structure, schedule of Ossification, mechanical properties of bone, roentgen graphic appearance of bone

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d. Assessment of growth and development: Growth prediction, growth spurts, the concept of normality and growth increments of growth, differential growth, gradient of growth, methods of gathering growth data. Theories of growth and recent advances, factors affecting physical growth.

e. Muscles of mastication: Development of muscles, muscle change during growth, muscle function and facial development, muscle function and malocclusion

f. Development of dentition and occlusion: Dental development periods, order of tooth eruption, chronology of permanent tooth formation, periods of occlusal development, pattern of occlusion.

g. Assessment of skeletal age.

Physiology:

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

Dental Materials:

a. Gypsum products: Dental plaster, dental stone and their properties, setting reaction etc.
b. Impression materials: Impression materials in general and particularly of alginate impression material.
c. Acrylics: Chemistry, composition physical properties Composites: Composition types, properties, setting reaction
d. Banding and bonding cements:
e. Wrought metal alloys: Deformation, strain hardening, annealing, recovery, recrystallization, grain growth, properties of metal alloys
f. Orthodontic arch wires
g. Elastics: Latex and non-latex elastics.
h. Applied physics, Bioengineering and metallurgy
: i. Specification and tests methods used for materials used in Orthodontics:
j. Survey of all contemporary literature and recent advances in above mentioned materials:

Genetics:

a. Cell structure, DNA, RNA, protein synthesis, cell division
b. Chromosomal abnormalities
c. Principles of orofacial genetics
d. Genetics in malocclusion

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e. Molecular basis of genetics
f. Studies related to malocclusion
g. Recent advances in genetics related to malocclusion
h. Genetic counselling
i. Bioethics and relationship to Orthodontic management of patients.

Physical Anthropology:

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

Pathology:

a. Inflammation
b. Necrosis

Biostatistics:

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

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

Applied Pharmacology

Definitions & terminologies used –

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

PART-II:

Paper-I:

Basic Orthodontics Orthodontic History:

a. Historical perspective
b. Evolution of orthodontic appliances,

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c. Pencil sketch history of Orthodontic peers
d. History of Orthodontics in India

Concepts of Occlusion and Esthetics:

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

Etiology and Classification of Malocclusion:

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

Dentofacial Anomalies:

a. Anatomical, physiological and pathological characteristics of major groups of developmental defects of the orofacial structures. Diagnostic Procedures and Treatment Planning in Orthodontics: a. Emphasis on the process of data gathering, synthesis and translating it into a treatment plan
b. b. Problem cases – analysis of cases and its management
c. Adult cases, handicapped and mentally retarded cases and their special problems
d. Critique of treated cases.

Cephalometrics

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

Practice Management in Orthodontics:

a. Economics and dynamics of solo and group practices
b. Personal management
c. Materials management
d. Public relationse.
e. Professional relationship
f. Dental ethics and jurisprudence
g. Office sterilization procedures
h. Community based Orthodontics.
i. Orthodontic office design

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Paper-II:Clinical Orthodontics

Myofunctional Orthodontics:

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

Dentofacial Orthopedics:

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

Cleft lip and palate rehabilitation:

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

Biology of tooth movement:

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

Orthodontic / Orthognathic surgery:

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

Ortho / Perio / Prostho/Endo inter relationship:

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

Basic principles of mechanotherapy includes removable appliances and fixed appliances:

a. Design
b. Construction

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c. Fabrication
d. Management
e. Review of current literature on treatment methods and results

Applied preventive aspects in Orthodontics:

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

Clinical procedures

Interceptive Orthodontics:

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

Evidence Based Orthodontics:

Different types of fixed Mechanotherapy:

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

Retention and relapse:

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

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

Paper-III:

Essays (descriptive and analyzing type questions) Practical and clinical skills.

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PRE – CLINICAL EXERCISES

(Practical exercises) (Should be completed within 3 months) The students should be posted in rotation under all professors/ eligible teaching faculty. A general outline of the type of exercises is given here:

1. General Wire bending exercises to develop the manual dexterity.
2. Clasps, Bows and springs used in the removable appliances.
3. Soldering and welding exercises.
4. Fabrication of removable, habit breaking, mechanical and functional appliances, also all types of space maintainers and space regainers
. 5. Bonwill Hawley Ideal arch preparation
. 6. Construction of orthodontic models trimmed and polished.
7. Cephalometric tracing and various Analyses, also superimposition methods –8. Fixed appliance typodont exercise
9. Training shall be imparted in one basic technique i.e. Standard Edgewise / Begg technique or its derivative / Straight wire etc., with adequate exposure to other techniques. a) Typodont exercise • Band making • Bracket positioning and placement • Different stages in treatment appropriate to technique taught
10. Clinical photography
11. Computerized imaging (Computerised digital tracing using computer softwares and treatment predictions using software)
12. Preparation of surgical splints, and splints for TMJ problems.
13. Handling of equipment like vacuum forming appliances and hydro solder etc.(vacuum formed cap splint)

Basic preclinical exercise work for the MDS students

1. CLASPS

Sl. NO	EXERCISE	NO.
1	¾ CLASPS	1
2	Triangular clasps	1
3	Adams clasp	2
4	Modification of adams- with helix	2
5	Southend clasp	1

2. LABIAL BOWS

1.	Short labial bow(upper and lower)	1
2.	Long labial bow(upper and lower)	1
3.	Split high labial bow	1

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	3. Springs		
	1.	Double cantilever spring	**1**
	2.	Coffin spring	**1**
	3.	T - spring	**1**
	4. Appliance		
	1	Hawley's retention appliance with anterior bite plane	1
	2	Upper Hawley's appliance with posterior bite plane	1
	3	Upper expansion appliance with expansion screw	1
	4	Habit breaking appliance with tongue crib	1
	5	Oral screen and double oral screen	1
	6	Lip bumper	1
	7	Inclined plane	1
	8		
	9	Splint for Bruxism	1
	10	Catalans appliance	1
	11	Activator	1
	12	Bionator Frankel-FR 1& 2 appliance	1
	13	Twin block	1
	14	Lingual arch	1
	15	TPA	1
	16	Quad helix	1
	17	Utility arches	1
	18	Pendulum appliance	1

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	19 20 21	Canine Retractor(Marcotte & PG Spring) Maxillary intrusion splint with tube positioning for headgear Occlusal splint U/L with biostar	1 1

5. FIXED APPLIANCES – COMPONENTS

Nance holding arch(19 gauge)
Lower lingual arch(19 gauge)
Transpalatal arch(19 gauge)
Quad helix (19 gauge)
Fixed tongue crib(21 gauge)
Hass expansion applliance (19 gauge)
Adam's clasp with soldered buccal tube (21 gauge)

6.LIGHT ARCH ROUND WIRE EXERCISES:

- **STRAIGHTENING OF WIRE 3 INCHES IN LENGTH (0.016")- one number**
- **CUSPID CIRCLE (0.016")**
- **BOOT SHAPE INTERMAXILLARY HOOK (0.016")**
- **5 VERTICAL LOOPS (0.0 16")**
- **BAYONET BENDS (0.016")**
- **BUCCOLINGUAL OFFSET BENDS (0.016")**
- **MOLAR STOP OR LUG (0.016")**
- **DOUBLE BACK BEND (0.016")**
- **UPPER PLAIN ARCH FORM (0.016")**
- **LOWERARCH FORM WITH INTERMAXILLARY HOOK (0.016")**
- **UPPER PLAIN ARCH WIRE WITH BAYONETBENDS(0.016")**
- **PLAINARCH WITH TOE IN BENDS (0.016")**
- **PLAIN ARCH WITH TOE OUT BENDS (0.016")**
- **UPPER PLAIN ARCH FORM WITH ANCHOR BEND (0.016")**
- **LOWER LOOPED ARCH WIRE WITH ANCHOR BEND (0.016")**
- **STAGE II ARCH WIRE (0.018")**
- **STAGE III ARCH WIRE - UPPER (0.020"), LOWER (0.018")**
- **UPRIGHTING SPRING (RIGHT AND LEFT) (0.0 14") (CANINE AND PREMOLAR)**
- **ROTATION CORRECTION SPRING (0.020")**
- **SEPARATING SPRING (0.018")**
- **BREAKING AUXLARY (0.014")**
- **Two SPUR BEGG ARCH (0.014")**
- **FOUR SPUR BEGG ARCH (0.014")**
- **RECTANGULAR WIRE EXERCISES**
- **IDEAL ARCH BONWILL-HAWLEY (SS 16x22)**

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- PLACEMENT OF 1ST ORDER BENDS (SS 16x22)

- PLACEMENT OF 2ND ORDER BENDS (SS16x22) PLACEMENT OF 3RD ORDER BENDS (SS 16x22)
- UTILITY ARCH WIRE (SS 16x22) o PROTRACTION o RETRACTION
- TEAR DROP LOOP (SS 16x22) o WITH SWEEP o WITHOUT SWEEP
- BULL LOOP (SS 16X22)
- KEYHOLE LOOP (SS 16x22)- SINGLE&DOUBLE
- BOX LOOP (SS 16x22)
- T LOOP (TMA 17x25)

7. Soldering exercises:

Sl.no	Exercise	No.
1	Star / comb / Christmas tree	1

8. Study model preparation: As per specification of " indian board of orthodontics" standards

9. Model analysis – Mixed and permanent Dentition:

10. Cephalometrics

Sl.no	Exercise
1	Lateral cephalogram to be traced in different colours and superimposed to see the accuracy of tracing.
2	Vertical and anterio posterior cephalometric analysis(steiners, mcnamara, bjork, COGS , WITS DOWNS , tweeds , ricketts, grummons)
3	Soft tissue analysis – holdaway and burstone
4	Various superimposition methods

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11. Basics of Clinical Photography including Digital Photography:

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

Sl. no	Exercise
1	Teeth setting in Class-II division I malocclusion with maxillary anterior Proclination and mandibular anterior crowding
2	Band pinching, welding brackets and buccal tubes to the bands
3	Different Stages dependent on the applied technique
4	Bonding of brackets with Niti plain arch wire 17x25
5	Retraction mechanics — t loop and tear drop
6	Intrusion mechanics — k-sir and three piece

CLINICAL WORK:

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

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

The type of cases can be as follows:

- Removable active appliances
- Class-I malocclusion with Crowding
- Class-I malocclusion with bi-maxillary protrusion
- Class-II division – 1
- Class-II division – 2
- Class-III (Orthopedic, Surgical, Orthodontic cases)
- Inter disciplinary cases
- Removable functional appliance cases like activator, Bionator, functional regulator, twin block and new developments

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- Fixed functional appliances – Herbst appliance, jasper jumper etc
- Dento-facial orthopedic appliances like head gears, rapid maxillary expansion, NITI expander etc.,
- Appliance for arch development such as molar distalization
- Fixed mechano therapy cases (Begg, PEA, Tip edge, Edgewise, lingual)
- Retention procedures of above treated cases.

WRITING THESIS/RESEARCH PAPERS:

Attitudes including Communication Skills

A. Develop adequate communication skills particularly with the patients giving them the various options available to manage a particular Dentofacial problem and to obtain a true informed consent from them for the most appropriate treatment available at that point of time

B. Develop the ability to communicate with professional colleagues in orthodontics or other specialities through various media like correspondence, internet, e-video, conference, etc. To render the best possible treatment Training in Research Methodology, Biostatistics, Ethics / Bioethics in Dentistry, Jurisprudence and Audits All MDS candidates shall compulsorily attend the Research Methodology Workshop conducted by the University within 6 months from the date of joining the course. In this regard, the candidates will be issued a completion Certificate by the University.

EVERY POST GRADUATE STUDENT MUST UNDERGO A TRAINING IN RESEARCH METHODOLOGY, BIOSTATISTICS, ETHICS, BIOETHICS IN RESEARCH, JURISPRUDENCE AND AUDITS, WITHIN THE FIRST SIX MONTHS OF COURSE, WHICH WILL HELP THEM TO DECIDE THEIR DISSERTATION TOPIC AND METHODOLOGY Health Informatics ¨C usage of Information technology (Computer) STUDENTS SHOULD BE MADE WELL FAMILIAR WITH THE REQUIRED COMPUTER AND INFORMATICS SKILLS .

(a) LECTURES: There shall be some didactic lectures in the speciality and in the allied fields. The departments shall encourage guest lectures in the required areas and integrated lectures by multi-disciplinary teams on selected topics, to strengthen the training programmes.

(b) JOURNAL REVIEW: The journal review meetings shall be held at least once a week. All trainees, associate and staff associated with the post-graduate programme are expected to participate actively and enter relevant details in the logbook. The trainee shall make presentations from the allotted journals of selected articles.

(c) SEMINARS: The seminars shall be held at least twice a week in each department. All trainees are expected to participate actively and enter relevant details in logbook.

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(d) SYMPOSIUM: It is recommended to hold symposium on topics covering multiple disciplines.

(e) CLINICAL POSTINGS: Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases.

(f) CLINICO-PATHOLOGICAL CONFERENCE: The clinico pathological conference shall be held once a month involving the faculties of Oral Medicine and Radiology, Oral Pathology and allied clinical departments. The trainees shall be encouraged to present the clinical details, radiological and histo-pathological interpretations and participation in the discussions.

(g) INTER-DEPARTMENTAL MEETINGS: To encourage integration among various specialities, there shall be inter-departmental meeting chaired by the Dean with all heads of post-graduate departments at least once a month.

(h) TEACHING SKILLS: All the trainees shall be encourages to take part in undergraduate teaching programmes either in the form of lectures or group discussion.

(i) DENTAL EDUCATION PROGRAMMES: Each department shall organise dental education programmes on regular basis involving other institutions. The trainees shall also be encouraged to attend such programmes conducted outside their university or institute.

(j) CONFERENCES/WORKSHOPS/ADVANCED COURSES: The trainees shall be encouraged to attend conference/workshops/advanced courses and also to present at least two scientific papers and two posters at State/national level speciality and allied conferences/conventions during the training period.

(k) ROTATION AND POSTING IN OTHER DEPARTMENTS: To bring in more integration among the specialities and allied fields, each department shall workout a programme to rotate the trainees in related disciplines.

STRUCTURED TRAINING PROGRAMME

(a) Journal Clubs 5 in a year

(b) Seminars 5 in a year

(c) Clinical Case Presentations 4 in a year

(d) Lectures taken for undergraduates1 in a year

(e) Scientific Paper / Poster Presentations In State /National Level Conferences 4 papers/posters during three years of training workshop period

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(f) Clinico Pathological Conferences 2 presentations during three years of training period
(g) Scientific Publications (optional) one publication in any indexed scientific journal
(h) Submission of Synopsis one synopsis within six months from the date of commencement of the course
(i) Submission of Dissertation months one dissertation within six months before appearing for the University examination
(j) Submission of Library Dissertation one dissertation within eighteen months from the date of commencement

DISSERTATION:

Every candidate appearing for the post-graduate degree examination shall at least six months prior to the examinations, submit with his form for examination, four typewritten copies of the dissertation undertaken by the candidate, prepared under the direction and guidance of his/her guide. It must be approved by the Institutional Review Board consisting of Principal, all the HOD's, an advocate, medical specialties and social worker within the first six months after the commencement of the course. The application for registration of dissertation topic must be sent through the Principal duly forwarded by the Professor/ HOD. The University will register such dissertation topic. In case the students want to change the topic of dissertation, they cando it within the next three months. No change in the Guide/dissertation topic shall be made without prior approval of the University. The aim of dissertation is to train a postgraduate student in research methodology.

It includes identification of a problem with recent advances, designing of research study on collection of data, practical analysis and comparison of results and drawing conclusions

The dissertation should be written under the following headings. Introduction /Aims and objective/Review and literature/Materials & Methods/Results/Discussion

Conclusion/Summary

The written text of dissertation shall not be less than 100pages. It should be neatly typed in double line spacing on one side (A4 size, 8. 27"x 11.69") and bounded properly. Photos, charts, tables, tables and graphs can be attached where ever necessary. Spiral binding should not be used.

The dissertation shall be certified by the Guide and Head of the department and forwarded by the Principal to the University. The dissertation so submitted shall be referred to the examiners for their examination and acceptance of it shall be a condition precedent to allow the candidate to appear for the written part of the examination. Provided that a candidate whose dissertation has been accepted by the examiner, but declared failed at the examination, shall be permitted to re-appear at

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	the subsequent examination without a new dissertation. Provided further that if the dissertation is rejected by the examiner, the examiner shall assign reasons thereof with suggestions for its improvement to the candidate and such candidate shall re-submit his/ her dissertation to the examiner who shall accept it before appearing in the examination.

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ORAL & MAXILLOFACIAL PATHOLOGY AND ORAL MICROBIOLOGY

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

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	I MDS	**1. Biostatistics and Research Methodology**: • Basic principles of biostatistics and study as applied to dentistry and research • Collection/ organization of data/ measurement scales / presentation of data and analysis • Measures of central tendency • Measures of variability • Sampling and planning of health survey • Probability, normal distribution & indicative statistics • Estimating population values • Tests of significance(parametric/non-parametric qualitative methods) • Analysis of variance • Association, correlation and regression **Approach:** • Didactic Lectures **2.Applied Gross Anatomy of head and neck, histology and genetics :** • Temporo-mandibular joint • Trigeminal nerve and facial nerve • Muscles of mastication • Tongue • Salivary glands • Nerve supply, blood supply, lymphatic drainage & venous drainage of oro-dental tissues • Development of face, palate, mandible, maxilla, tongue and applied aspects of the same • Development of teeth & dental tissues and developmental defects of oral and maxilla- facial region & abnormalities of teeth • Maxillary sinus • Jaw muscles and facial muscles• Introduction to genetics • Modes of inheritance • Chromosomal anomalies of oral tissues & single gene disorders **Approach:** • Didactic Lectures • Postings in the Department of Anatomy for dissection of Head, Face and Neck **3. Physiology (General & Oral) :** • Saliva • Pain • Mastication • Taste • Deglutition • Wound healing • Vitamins (influence on growth, development and structure of oral soft and hard

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		tissues & paraoral tissues) • Calcium metabolism • Theories of mineralization • Tooth eruption and shedding • Blood and its constituents • Hormones (influence on growth, development and structure of oral soft and hard tissues & paraoral tissues) **Approach:** • Didactic Lectures **4. Cell Biology :** • Cell structure and function (ultra structural & molecular aspects) • Intercellular junctions • Cell cycle and division • Cell cycle regulators • Cell–cell & cell-extracellular matrix interactions • Detailed molecular aspects of DNA,RNA and intracellular organelles, transcription and translation and molecular biology techniques **Approach:** • Seminars & Didactic Lectures **5. General Histology :** • Light & electron microscopy considerations of epithelial tissues and glands,bone. • Light & electron microscopy considerations of hemopoetic system, lymphatic system, muscle, neural tissue, endocrinal system (thyroid, pituitary, parathyroid) **Approach:** • Didactic Lectures • Postings in the Department of Anatomy & Histology for slide discussion • Record book to be maintained 6. Biochemistry : • Chemistry of carbohydrates, lipids and proteins • Methods of identification and purification • Metabolism of carbohydrates, lipids and proteins • Biological oxidation • Various techniques-cell fractionation and ultra filtration, centrifugation, electrophoresis, spectrophotometry and radioactive techniques **Approach:**

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		• Didactic Lectures • Postings in the Department of Biochemistry to familiarize with various techniques • Record book to be maintained **7. General Pathology :** • Inflammation and chemical mediator • Thrombosis • Embolism • Necrosis • Repair • Degeneration • Shock • Hemorrhage • Pathogenic mechanisms at molecular level • Blood dyscrasias • Carcinogenesis and neoplasia **Approach:** • Didactic Lectures & Seminars • General Pathology posting - 15 days **8. General Microbiology :** • Definitions of various types of infections • Routes of infection and spread • Sterilization ,disinfection and antiseptics • Bacterial genetics • Physiology, growth of microorganisms **Approach:** • Didactic Lectures & Seminars **9. Basic Immunology :** • Basic principles of immunity, antigen and antibody reaction • Cell mediated and humoral immunity • Immunology of hypersensitivity • Immunological basis of auto immune phenomena • Immunodeficiency with relevance to opportunistic infections • Basic principles of transplantation and tumor immunity **Approach:** • Didactic Lectures & Seminars **10. Systemic Microbiology / Applied Microbiology :** Morphology, classification, pathogenicity, mode of transmission, methods of prevention, collection and transport of specimen for laboratory diagnosis, staining methods, common culture media, interpretation of laboratory reports and antibiotic sensitivity tests. • Staphylococci • Streptococci •

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		Corynebacterium diphtheria • Mycobacteria • Clostridia, bacteroids & fusobacteria • Actinomycetales • Spirochetes • General structure, broad classification of viruses, pathogenesis, pathology of viral infections • Herpes virus • Hepatitis virus • HIV • General properties of fungi • Superficial, subcutaneous, deep opportunistic infections • General principles of fungal infections, method of collection of samples, diagnosis and examination of fungi **Approach:** • Didactic Lectures & Seminars • Postings in the Department of Microbiology to familiarize with relevant diagnostic methods – 15 days • Record book to be maintained **11. Oral biology (Oral and Dental Histology) :** • Study of morphology of permanent and deciduous teeth • Structure and function of oral, dental and paraoral tissues including their ultra structure, molecular and biochemical aspects Approach: • Didactic Lectures & Seminars • Slide discussion on histological appearance of normal oral tissues • Record book to be maintained **12. Basic Histo-Techniques and Microscopy :** • Routine hematological tests and clinical significance of the same • Biopsy procedures for oral lesions • Tissue processing • Microtome and principles of microtomy • Various stains used in histopathology and their applications • Microscope, principles and theories of microscopy • Light microscopy and various other types including electron microscopy• Fixation and fixatives • Ground sections and decalcified sections • Cytological smears **Approach:** • Didactic Lectures & Seminars • Postings in Clinical Pathology and Microbiology for relevant training • Preparation of Ground and decalcified sections, tissue processing, sectioning and staining • Tooth Carving (Permanent Dentition) • Record book to be maintained

		1. Oral and Dental Pathology: • Developmental disorders of oral and paraoral structures • Potentially malignant disorders • Benign and malignant tumors of the oral cavity • Odontogenic cysts and tumors • Pathology of salivary glands • Regressive alterations of teeth • Bacterial, fungal, viral and protozoal infections of the oral cavity • Dental caries • Diseases of pulp and periapical region • Spread of oral infection • Healing of oral wounds • Physical and chemical injuries of oral cavity • Oral aspects of metabolic diseases • Diseases of bones and joints • Diseases of skin and mucous membrane • Diseases of periodontia • Diseases of blood and blood forming organs • Diseases of nerves and muscles • Oro-facial pain • Immunological diseases of oral cavity including tumor immunology • Molecular pathology • Oral Microbiology **Approach:** • Didactic Lectures & Seminars • Postings in the Department of Dermatology of a Medical College – 15 days • Postings in a Cancer Centre – 15 days **2. Basic histo-techniques and microscopy:** • Enzyme histochemistry • Principles, techniques and applications of immunofluorescence • Principles, techniques and applications of immunohistochemistry • Preparation of frozen sections • Museum set up • Quality control • Animal models **Approach:** • Didactic Lectures & Seminars • Training to be imparted in the Department or in other institutions having the facility • Visit to the centre of animal experimentation to be familiarize with laboratory techniques, upkeep and care of animals – 15 days • Record book to be maintained **3. Recent Molecular Techniques:** • Basic principles, techniques and applications of – • PCR • BLOTS • Hybridization • Recombinant DNA

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		technology • Micro array • DNA sequencing • Cell culture and cloning **Approach:** • Didactic Lectures & Seminars • Training to be imparted in the Department or in other institutions having the facility – 15 days • Record book to be maintained **4. Recording of Case History and Clinico-Pathological Discussions:** **Approach:** • Postings in the Department of Oral Medicine, Diagnosis & Radiology – 6 months • Oral surgery posting - 2 months • Record of minimum 10 case histories to be maintained **5. Histopathology – Slide discussion:** • Record book to be maintained
	III MDS	• Forensic odontology • Giant cell lesions • Clear cell lesions • Round cell lesions • Spindle cell lesions • Pigmented lesions • Fibro-osseous lesions Mechanism of formation and expansion of cysts of orofacial region • Mechanism of growth and metastasis of tumors • Lab diagnosis of bacterial infections • Lab diagnosis of viral infections • Lab diagnosis of fungal infections • Hamartomas • Phakomatoses • Vascular tumors of oro-facial region • Genodermatoses • Tumor markers

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		• Histogenesis of salivary gland tumors • Tumor angiogenesis • Concept of premalignancy • Blue cell lesions • Molecular basics of oral squamous cell carcinoma • Matrix remodelling in pathological condition • Etiopathogenesis of developmental defects of teeth • Viral oncogenesis • Lesions associated with impacted and missing teeth • Syndromes affecting oro-facial region • Hereditary oral defects • Techniques to assess the prognosis of neoplastic lesions • Vesiculo-bullous lesions • Lymphoreticular malignancy • Haemopoietic malignancy • Micronutrients • Oral aspects of metabolic disorders • Hormones and oro-maxillofacial lesions • Matrix metalloproteinases • Current concepts in HIV related oral diseases • Current concepts in OSMF • Epithelial –connective tissue interaction • Stem cell research **Approach:** • Didactic Lectures & Seminars • Postings in the Department of Forensic Medicine / Sciences – 15 days • Record book to be maintained • **Research Methodology Workshop** All MDS candidates shall compulsorily attend the Research Methodology Workshop conducted by the University within 6 months from the date of joining the course. In this regard, the candidates will be issued a completion Certificate by the University. **Monitoring Learning Progress:** It is essential to monitor the learning progress of each candidate through continuous appraisal and regular assessment. It not only helps

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		teachers to evaluate students, but also students to evaluate themselves. The monitoring should be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment is done using checklists that assess various aspects. Checklists are given in Section **IV.TEACHING LEARNING METHODS (including Clinical Study)** **(a) LECTURES:** There shall be some didactic lectures in the speciality and in the allied fields. The departments shall encourage guest lectures in the required areas and integrated lectures by multi-disciplinary teams on selected topics, to strengthen the training programmes. (b) JOURNAL REVIEW: The journal review meetings shall be held at least once a week. All trainees, associate and staff associated with the post-graduate programme are expected to participate actively and enter relevant details in the logbook. The trainee shall make presentations from the allotted journals of selected articles. (c) SEMINARS: The seminars shall be held at least twice a week in each department. All trainees are expected to participate actively and enter relevant details in logbook. (d) SYMPOSIUM: It is recommended to hold symposium on topics covering multiple disciplines. (e) CLINICAL POSTINGS: Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases. (f) CLINICO-PATHOLOGICAL CONFERENCE: The clinico pathological conference shall be held once a month involving the faculties of Oral Medicine and Radiology, Oral Pathology and allied clinical departments. The trainees shall be encouraged to present the clinical details,

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		radiological and histo-pathological interpretations and participation in the discussions. (g) INTER-DEPARTMENTAL MEETINGS: To encourage integration among various specialities, there shall be inter-departmental meeting chaired by the Dean with all heads of post-graduate departments at least once a month. (h) TEACHING SKILLS: All the trainees shall be encourages to take part in undergraduate teaching programmes either in the form of lectures or group discussion. (i) DENTAL EDUCATION PROGRAMMES: Each department shall organise dental education programmes on regular basis involving other institutions. The trainees shall also be encouraged to attend such programmes conducted outside their university or institute. (j) CONFERENCES/WORKSHOPS/ADVANCED COURSES: The trainees shall be encouraged to attend conference/workshops/advanced courses and also to present at least two scientific papers and two posters at State/national level speciality and allied conferences/conventions during the training period. (k) ROTATION AND POSTING IN OTHER DEPARTMENTS: To bring in more integration among the specialities and allied fields, each department shall workout a programme to rotate the trainees in related disciplines. **DISSERTATION** Every candidate appearing for the post-graduate degree examination shall at least six months prior to the examinations, submit with his form for examination, four typewritten copies of the dissertation undertaken by the candidate, prepared under the direction and guidance of his/her guide. It must be approved by the Institutional Review Board consisting of Principal, all the

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		HOD's, an advocate, medical specialties and social worker within the first six months after the commencement of the course. The application for registration of dissertation topic must be sent through the Principal duly forwarded by the Professor/ HOD. The University will register such dissertation topic. In case the students want to change the topic of dissertation, they cando it within the next three months. No change in the Guide/dissertation topic shall be made without prior approval of the University. The aim of dissertation is to train a postgraduate student in research methodology. It includes identification of a problem with recent advances, designing of research study on collection of data, practical analysis and comparison of results and drawing conclusions. The dissertation should be written under the following headings. Introduction /Aims and Objective /Review and literature /Materials & Methods/Result /Discussion **Conclusion/Summary** The written text of dissertation shall not be less than 100pages. It should be neatly typed in double line spacing on one side (A4 size, 8. 27"x 11.69") and bounded properly. Photos, charts, tables, tables and graphs can be attached where ever necessary. Spiral binding should not be used. The dissertation shall be certified by the Guide and Head of the department and forwarded by the Principal to the University. The dissertation so submitted shall be referred to the examiners for their examination and acceptance of it shall be a condition precedent to allow the candidate to appear for the written part of the examination.

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		Provided that a candidate whose dissertation has been accepted by the examiner, but declared failed at the examination, shall be permitted to re-appear at the subsequent examination without a new dissertation. Provided further that if the dissertation is rejected by the examiner, the examiner shall assign reasons thereof with suggestions for its improvement to the candidate and such candidate shall re-submit his/ her dissertation to the examiner who shall accept it before appearing in the examination

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ORAL MEDICINE AND RADIOLOGY

SUBJECT	COURSE OUTCOME
ORAL MEDICINE AND RADIOLOGY	Oral Medicine is a speciality of dentistry concerned with the basic diagnostic procedures and techniques useful in recognising the diseases of the oral tissues of local and constitutional origin and their medical management. Radiology is a science dealing with x-rays and their uses in diagnosis and treatment of diseases in relation to orofacial diseases **1. GOAL** The goals of the post-graduate training in Oral Medicine and Radiology specialities is to train the graduate in Dental Surgery who will (i) Practice Oral Medicine and Radiology efficiently and effectively, backed by scientific knowledge and skill; (ii) Exercise empathy and a caring attitude and maintain high ethical standards; (iii) Continue to evince keen interest in professional education in the speciality and allied specialities whether in teaching or practice; (iv) Willing to share the knowledge and skills with any learner, junior or a colleague; (v) To develop the faculty for critical analysis and evaluation of various concepts and views and to adopt the most rational approach. **2. OBJECTIVES** The objective of the post-graduate training is to train a student so as to ensure higher competence in both general and special area of interest and prepare him or her for a career in teaching, research and speciality practice. A student must achieve a high degree of clinical proficiency in the subject and develop competence in research and its methodology in the concerned field. The objectives to be achieved by the candidate on completion of the course may be classified as under:– (a) Knowledge (Cognitive domain) (b) Skills (Psycho motor domain) (c) Human values, ethical practice and communication abilities **(A) KNOWLEDGE** (i) demonstrate understanding of basic sciences relevant to speciality; (ii) describe etiology, pathophysiology, principles of diagnosis and management of common problems within the speciality in adults and children; (iii) identify social, economic, environmental and emotional determinants in a given case and take them into account for planned treatment; (iv) recognise conditions that may be outside the area of speciality or competence and to

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(v) update knowledge by self study and by attending courses, conferences and seminars pertaining to speciality;
(vi) undertake audit, use information technology and carry out research in both basic and clinical with the aim of publishing or presenting the work at various scientific gathering;

(B) ATTITUDE

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

(C) SKILLS

(i) 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;
(ii) acquire adequate skills and competence in performing various procedures as required in the speciality.

3. COMPONENTS OF THE POSTGRADUATE CURRICULUM

- Theoretical Knowledge

demonstrate understanding of basic sciences relevant to speciality; describe etiology, pathophysiology, principles of diagnosis and management of common problems within the speciality in adults and children; identify social, economic, environmental and emotional determinants in a given case and take them into account for planned treatment;

- Practical and Clinical Skills

(i) 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; (ii) acquire adequate skills and competence in performing various procedures as required in the speciality.

- **Writing Thesis / Research Papers**

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All Post Graduate students shall prepare a dissertation based on the clinical or experimental work or any other study conducted by them under the supervision of the The Head of Department and guide. Submission of Synopsis related to the dissertation work: One synopsis within six months from the date of commencement of the course

Submission of Dissertation months:

One dissertation within six before appearing for the university examination • Attitudes including Communication Skills Develop adequate communication skills particularly with the patients giving them various options available to manage a particular Dentofacial problem and to obtain a true informed consent from them for the most appropriate treatment available at that point of time. Develop the ability to communicate with professional colleagues through various media like correspondence, Internet, e-video, conference, etc. To render the best possible treatment. Training in Research Methodology, Biostatistics, Ethics/Bioethics in Dentistry , Jurisprudence and Adults

• Research methodology

All MDS candidates shall compulsorily attend the Research Methodology Workshop conducted by the University within 6 months from the date of joining the course. In this regard, the candidates will be issued a completion Certificate by the University. Definitions types of research, designing written protocol for research, objectivity in methodology, quantification, records and analysis. Biostatistics- introduction, applications, uses and limitations of bio-statistics in Public Health dentistry, collection of data, presentation of data, measures of central tendency, measures of dispersion, methods of summarizing, parametric and non parametric tests of significance, correlation and regression, multivariate analysis sampling and sampling techniques – types, errors, bias, trial and calibration.

Bioethics

1. Respect human life and the dignity of every individual
. Refrain from supporting or committing crimes against humanity 3. Treat the sick and injured with competence and compassion 4. Protect the privacy and confidentiality of those for whom we care and breach that confidence only when keeping it would seriously threaten their health and safety or that of others 5. Work freely with colleagues to discover, develop, and promote advances in medicine and public health that ameliorate suffering and contribute to human well being 6. Educate the public about present and future threats to the health of humanity 7. Advocate for social, economic, educational and political changes that ameliorate suffering and contribute to human well being. 8. Teach and mentor those who follow US, for they are the future of our caring profession. • Health informatics- usage of information technology (Computer) basic understanding of computers and its components, operating software (Windows), Microsoft office,

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preparation of teaching materials like slides, project, multimedia knowledge.

4. THEORY SYLLABUS

Applied Anatomy

1. Gross anatomy of the face:

a. Muscles of Facial Expression And Muscles Of Mastication
b. Facial nerve
c. Facial artery
d. Facial vein
e. Parotid gland and its relations

2. Neck region:

a. Triangles of the neck with special reference to Carotid, Digastric triangles and midline structures
b. Facial spaces
c. Carotid system of arteries, Vertebral Artery, and Subclavian arteries
d. Jugular system Internal jugular External jugular
e. Lymphatic drainage
f. Cervical plane
g. Muscles derived from Pharyngeal arches
h. Infratemporal fossa in detail and temporomandibular joint
i. Endocrine glands Pituitary
j. Sympathetic chain
k. Cranial nerves-V, VII, IX, XI, & XII
• Thyroid • Parathyroid I. Exocrine glands • Parotid • Thyroid Page 4 of 21• Parathyroid 3. Oral Cavity: a. Vestibule and oral cavity proper b. Tongue and teeth c. Palate - soft and hard 4. Nasal Cavity a. Nasal septum b. Lateral wall of nasal cavity c. Paranasal air sinuses 5. Pharynx: Gross salient features of brain and spinal cord with references to attachment of cranial nerves to the brainstem. Detailed study of the cranial nerve nuclei of V, VII, IX, X, XI, XII Osteology: Comparative study of fetal and adult skull Mandible: Development, ossification, age changes and evaluation of mandible in detail

Embryology

1. Development of face, palate, nasal septum and nasal cavity, paranasal air sinuses 2. Pharyngeal apparatus in detail including the floor of the primitive pharynx 3. Development of tooth in detail and the age changes 4. Development of salivary glands 5. Congenital anomalies of face must be dealt in detail.

Histology:

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1. Study of epithelium of oral cavity and the respiration tract 2. Connective tissue 3. Muscular tissue 4. Nervous tissue 5. Blood vessels 6. Cartilage, bone and teeth 8. Tongue 9. Salivary glands 10. Tonsil, thymus, lymph nodes

Physiology:

1. **General Physiology:**

• Cell • Body Fluid Compartments • Classification • Composition • Cellular transport • RMP and action potential Muscle Nerve Physiology 2. Structure of a neuron and properties of nerve fibers 3. Structure of muscle fibers and properties of muscle fibers 4. Neuromuscular transmission 5. Mechanism of muscle contraction

Blood:

1. RBC and Hb 2. WBC - Structure and functions 3. Platelets - functions and applied aspects 4. Plasma proteins 5. Blood Coagulation with applied aspects 6. Blood groups 7. Lymph and applied aspects

Respiratory System:

• Air passages, composition of air, dead space, mechanics of respiration with pressure and volume changes • Lung volumes and capacities and applied aspects • Oxygen and carbon dioxide transport • Neural regulation of respiration • Chemical regulation of respiration • Hypoxia, effects of increased barometric pressure and decreased barometric pressure • Cardio-Vascular System: • Cardiac Cycle • Regulation of heart rate/ Stroke volume / cardiac output / blood flow • Regulation f blood pressure • Shock, hypertension, cardiac failure

Excretory system

• Renal function tests Gastro - intestinal tract: • Composition, functions and regulation of: • Saliva • Gastric juice • Pancreatic juice • Bile and intestinal juice • Mastication and deglutition

Endocrine system:

• Hormones - classification and mechanism of action • Hypothalamic and pituitary hormones • Thyroid hormones • Parathyroid hormones and calcium homeostasis • Pancreatic hormones • Adrenal hormones

Central Nervous System:

• Ascending tract with special references to pain pathway

Special Senses:

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• Gustation and Olfaction

Biochemistry

1. Carbohydrates - Disaccharides specifically maltose, lactose, sucrose –

Digestion of starch/absorption of glucose -Metabolism of glucose, specifically glycolysis, TCA cycle, gluconeogenesis -Blood sugar regulation - Glycogen storage regulation -Glycogen storage diseases -Galactosemia and fructosemia

2. Lipids

• Fatty acids- Essential/non essential • Metabolism of fatty acids- oxidation, ketone body formation, utilization ketosis • Outline of cholesterol metabolism- synthesis and products formed from cholesterol

3. Protein

-Amino acids- essential/non essential, complete/ incomplete proteins - Transamination/ Deamination (Definition with examples) -Urea cycle - Tyrosine- Hormones synthesized from tyrosine -In born errors of amino acid metabolism - Methionine and transmethylation

4. Nucleic Acids –

Purines/Pyrimidines Purine analogs in medicine • DNA/RNA-Outline of structure • Transcription / translation Steps of protein synthesis Inhibitors of protein synthesis Regulation of gene function

5. Minerals –

Calcium/Phosphorus metabolism specifically regulation of serum calcium levels -Iron metabolism - Iodine metabolism -Trace elements in nutrition

6. Energy Metabolism

- Basal metabolic rate - Specific dynamic action (SDA) of foods

7. Vitamins –

Mainly these vitamins and their metabolic role- specifically vitamin A, Vitamin C, Vitamin D, Thiamin, Riboflavin, Niacin, Pyridoxine

Pathology

: 1. Inflammation:

• Repair and regeneration, necrosis and gangrene • Role of complement system in acute inflammation • Role of arachidonic acid and its metabolites in acute inflammation

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	• Growth factors in acute inflammation • Role of molecular events in cell growth and intercellular signaling cell surface receptors • Role of NSAIDS in inflammation • Cellular changes in radiation injury and its manifestations Homeostasis • Role of Endothelium in thrombo - genesis • Arterial and venous thrombi • Disseminated Intravascular Coagulation Shock • Pathogenesis of hemorrhagic, neurogenic, septic, cardiogenic shock, circulatory disturbances, ischemic hyperemia, venous congestion, edema, infarction Chromosomal Abnormalities: • Marfan's syndrome • Ehler's Danlos Syndrome • Fragile X Syndrome Hypersensitivity: • Anaphylaxis • Type II Hypersensitivity • Type III Hypersensitivity • Cell mediated Reaction and its clinical importance • Systemic Lupus Erythmatosus • Infection and infective granulomas Neoplasia: • Classification of Tumors • Carcinogenesis & Carcinogens - Chemical, Viral and Microbial • Grading and Staging of Cancer, tumor Angiogenesis, Paraneoplastic Syndrome • Spread of tumors • Characteristics of benign and malignant tumors Others: • Sex linked agamaglobulinemia • AIDS • Management of Immune deficiency patients requiring surgical procedures • De George's Syndrome • Ghons complex, post primary pulmonary tuberculosis - pathology and pathogenesis **Phamacology:** 1. Definition of terminologies used 1. Dosage and mode of administration of drugs 3. Action and fate of drugs in the body 4. Drug addiction, tolerance and hypersensitive reactions 6. General and local anesthetics, hypnotics, analeptics, and & tranquilizers Chemotherapeutics and antibiotics 8. Analgesics and anti - pyretics 9. Anti - tubercular and anti - syphilitic drugs 10. Antiseptics, sialogogues, and anti - sialogogues 11. Haematinics 12. Anti - diabetics 13. Vitamins - A B Complex, C, D, E, K 14. Steroids

Part II:

Paper I :

Oral And Maxillofacial Radiology Study includes Seminars / lectures / Demonstrations

1. History of radiology, structure of x - ray tube, production of x - ray, property of x rays
1. Biological effects of radiation
2. Filtration of collimation, grids and units of radiation
3. Films and recording media
4. Processing of image in radiology
5. Design of x -ray department, dark room and use of automatic processing units 6. Localization by radiographic techniques
7. Faults of dental radiographs and concept of ideal radiograph
8. Quality assurance and audit in dental radiology
9. Extra - oral-imaging techniques
10. OPG and other radiologic techniques
11. Advanced imaging technique like CT Scan, MRI, Ultras one & thermo graphic 12. Radio nucleotide techniques
13. Contrast radiography in salivary gland, TMJ, and other radiolucent pathologies 14. Radiation protection and ICRP guidelines
15. Art of radiographic report, writing and descriptors preferred in reports
16. Radiograph differential diagnosis of radiolucent, radio opaque and mixed lesions
17. Digital radiology and its various types of advantages

Paper II:

Oral Medicine, therapeutics and laboratory investigations

1. Study includes seminars / lectures / discussion 2. Methods of clinical diagnosis of oral and systemic diseases as applicable to oral tissue including modern diagnostic techniques 3. Laboratory investigations including special investigations of oral and bro - facial diseases 4. Teeth in local and systemic diseases, congenital, and hereditary disorders 5. Oral manifestations of systemic diseases 6. Oro - facial pain 7. Psychosomatic aspects of oral diseases 8. Management of medically compromised patients including medical emergencies in the dental chair 9. Congenital and Hereditary disorders involving tissues of oro facial region Page 9 of 2110. Systemic diseases due to oral foci of infection 11. Hematological, Dermatological, Metabolic, Nutritional, & Endocrinal conditions with oral manifestations 12. Neuromuscular diseases affecting oro -facial region 13. Salivary gland disorders 14. Tongue in oral and systemic diseases 15. TMJ dysfunction and diseases 16. Concept of immunity as related to oro - facial lesions, including AIDS 17. Cysts, Neoplasms, Odontomes, and fibro - osseous lesions 18. Oral changes in Osteo - dystrophies and chondro - dystrophies 19. Pre malignant and malignant lesions of oro facial region 20.

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Allergy and other miscellaneous conditions 21. Therapeutics in oral medicine -clinical pharmacology 22. Forensic odontology 23. Computers in oral diagnosis and imaging 24. Evidence based oral care in treatment planning

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

Procedural and Operative Skills:

(The numbers mentioned are minimum to be performed by each candidate)

1st Year

Observe, Assist, & Perform under supervision Observe, Assist, & Perform under supervision 2. Intra - oral radiograph Perform an interpret -100

2 nd year

1. Dental treatment to medically compromised patients - - Observe, assist, and perform under supervision 2. Extra - oral radiographs, digital radiography - 25 - - Observe, assist and perform under supervision Operative skills: 1. Giving intra - muscular and intravenous injections Page 10 of 211. Administration of oxygen and life saving drugs to the patients 3. Performing basic CPR and certification by Red Cross

3rd Year

All the above Performed independently-
Case history: Routine cases -25 Interesting Cases - 25 Intra - oral Radiographs - 100 Periapical view - 50 Bitewing view - 25 - Occlusal view - 25 Extra-oral radiographs of different views -50

Monitoring Learning Progress

It is essential to monitor the learning progress to each candidate through continuous appraisal and regular assessment. It not only helps teachers to evaluate students, but also students to evaluate themselves. The monitoring to be done by the staff of the department based on participation of students in various teaching / learning activities. It may be structured and assessment be done using checklists that assess various aspects.

5. TEACHING LEARNING METHODS (including Clinical Study)

(a) LECTURES:

There shall be some didactic lectures in the speciality and in the allied fields. The departments shall encourage guest lectures in the required

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areas and integrated lectures by multi-disciplinary teams on selected topics, to strengthen the training programmes.

(b) JOURNAL REVIEW:

The journal review meetings shall be held at least once a week. All trainees, associate and staff associated with the post-graduate programme are expected to participate actively and enter relevant details in the logbook. The trainee shall make presentations from the allotted journals of selected articles.

(c) SEMINARS:

The seminars shall be held at least twice a week in each department. All trainees are expected to participate actively and enter relevant details in logbook.

(d) SYMPOSIUM:

It is recommended to hold symposium on topics covering multiple disciplines.

(e) CLINICAL POSTINGS:

Each trainee shall work in the clinics on regular basis to acquire adequate professional skills and competency in managing various cases.

(f) CLINICO-PATHOLOGICAL CONFERENCE:

The clinico pathological conference shall be held once a month involving the faculties of Oral Medicine and Radiology, Oral Pathology and allied clinical departments. The trainees shall be encouraged to present the clinical details, radiological and histo-pathological interpretations and participation in the discussions.

(g) INTER-DEPARTMENTAL MEETINGS:

To encourage integration among various specialities, there shall be inter-departmental meeting chaired by the Dean with all heads of post-graduate departments at least once a month.

(h) TEACHING SKILLS:

All the trainees shall be encourages to take part in undergraduate teaching programmes either in the form of lectures or group discussion.

(i) DENTAL EDUCATION PROGRAMMES:

Each department shall organise dental education programmes on regular basis involving other institutions. The trainees shall also be encouraged to attend such programmes conducted outside their university or institute.

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(j) CONFERENCES/WORKSHOPS/ADVANCED COURSES:

The trainees shall be encouraged to attend conference/workshops/advanced courses and also to present at least two scientific papers and two posters at State/national level speciality and allied conferences/conventions during the training period.

(k) ROTATION AND POSTING IN OTHER DEPARTMENTS:
To bring in more integration among the specialities and allied fields, each department shall workout a programme to rotate the trainees in related disciplines.

6. Structured Training Programme –

Clinical Postings yearwise Rotations and Posting in other Departments/institutions.

To bring in more integration among the specialities and allied fields, departments shall workout a programme to rotate All Post Graduate students. They should be posted in following departments for 15 days in 2nd year of training period on Rotation basis to acquire clinical and Diagnostic skills.

: Oral and Maxillofacial Surgery (15 days) Oral and Maxillofacial Pathology (15 days) Page 12 of 21Department of General Radiology (15 days) Radiotherapy (15 days) Medical Oncology (15 days) Dermatology (15 days)

7. Dissertation –

Submission of Protocol, Continuous Evaluation of Dissertation, Submission of completed Dissertation Every candidate appearing for the post-graduate degree examination shall at least six months prior to the examinations, submit with his form for examination, four typewritten copies of the dissertation undertaken by the candidate, prepared under the direction and guidance of his/her guide.

It must be approved by the Institutional Review Board consisting of Principal, all the HOD's, an advocate, medical specialties and social worker within the first six months after the commencement of the course. The application for registration of dissertation topic must be sent through the Principal duly forwarded by the Professor/ HOD.

The University will register such dissertation topic. In case the students want to change the topic of dissertation, they can do it within the next three months. No change in the Guide/dissertation topic shall be made without prior approval of the University.

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comparison of results and drawing conclusions. The dissertation should be written under the following headings.

Introduction /Aims and objective/Review and literature/Materials & Methods/Results/Discussion

COURSE YEAR	TEACHING / LEARNING ACTIVITIES:
I YEAR M.D.S.	1. Observe, Assist, & Perform under supervision Observe, Assist, & Perform under supervision 2. Intra - oral radiograph Perform an interpret - 100
II YEAR M.D.S.	1. Dental treatment to medically compromised patients -Observe, assist, and perform under supervision 2. Extra - oral radiographs, digital radiography - 25 - Observe, assist and perform under supervision **Operative skills:** 1. Giving intra - muscular and intravenous injections 2. Administration of oxygen and life saving drugs to the patients 3. Performing basic CPR and certification by Red Cross
III YEAR M.D.S	**All the above** • Performed independently-Case history: • Routine cases -25 • Interesting Cases – 25 • Intra - oral Radiographs - 100 • Periapical view - 50 • Bitewing view - 25

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		• Occlusal view - 25 • Extra-oral radiographs of different
	Conclusion/Summary The written text of dissertation shall not be less than 100pages. It should be neatly typed in double line spacing on one side (A4 size, 8. 27"x 11.69") and bounded properly. Photos, charts, tables, tables and graphs can be attached where ever necessary. Spiral binding should not be used. The dissertation shall be certified by the Guide and Head of the department and forwarded by the Principal to the University . The dissertation so submitted shall be referred to the examiners for their examination and acceptance of it shall be a condition precedent to allow the candidate to appear for the written part of the examination. Provided that a candidate whose dissertation has been accepted by the examiner, but declared failed at the examination, shall be permitted to re-appear at the subsequent examination without a new dissertation. Provided further that if the dissertation is rejected by the examiner, the examiner shall assign reasons thereof with suggestions for its improvement to the candidate and such candidate shall re-submit his/ her dissertation to the examiner who shall accept it before appearing in the examination.	

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