



CURRICULUM BS DENTAL TECHNOLOGY

**INSTITUTE OF PARAMEDICAL SCIENCES
KHYBER MEDICAL UNIVERSITY
PESHAWAR**

CURRICULUM FOR BS DENTAL TECHNOLOGY

Institute mission:

- IPMS is committed to provide window to all those students who aspire to become highly qualified health professionals and enable them to work as professionals. The IPMS KMU will endeavor to provide highly committed technologist to healthcare system of KPK.

Aims of BS Dental Technology:

- To produce highly knowledgeable and skilled dental technologists through training in dental clinics and dental laboratories under supervision of qualified faculty.
- To meet the future Dental care needs of the community and provision of trained dental Technology teachers and researchers.

Objectives:

- 1) To perform an effective role in the field of dentistry to improve the community dental health.
- 2) To provide dental therapist/technologists a status and recognition in the dental care delivery system through Improving their capability and Increasing awareness of their responsibilities.
- 3) To assist Maxillofacial surgeons during surgeries
- 4) To perform effective role in delivering the conservative treatment for the primary teeth
- 5) To enable the dental Technologists to fabricate prosthodontic appliances, crown and bridges, orthodontic appliances and surgical splints etc.
- 6) To provide primary dental care services to the community.
- 7) To enable the dental technologist, perform the exodontia of primary teeth and simple permanent teeth.
- 8) To enable the dental Technologist to perform the routine conservative treatment of permanent teeth.
- 9) To provide platform to conduct research in their respective field in pursuance of excellence.

Prepared By,

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FRAME WORK FOR B.S. Dental Technology (4 Year Programme)

➤ Total numbers of Credit hours	130 (HEC recommended:124-133)
➤ Duration	4 years
➤ Semester duration	16-18 weeks
➤ Semesters	8
➤ Course Load per Semester	15-18 Credit hours
➤ Number of courses per semester	5-8

SCHEME OF STUDIES FOR 4 YEAR B.S. DENTAL

Semester/Year	Name of Subject	CODE	Credits
First	BIOCHEMISTRY-I	PMS-601	4(3+1)
	HUMAN PHYSIOLOGY-I	PMS-602	4(3+1)
	HUMAN ANATOMY-I	PMS-603	4(3+1)
	ENGLISH-I	PMS-604	2(2+0)
	PAK STUDIES	PMS-605	2(2+0)
	COMPUTER SKILLS	PMS-606	2(1+1)
			18
Second	BIOCHEMISTRY-II	PMS-607	4(3+1)
	HUMAN PHYSIOLOGY-II	PMS-608	4(3+1)
	HUMAN ANATOMY-II	PMS-609	4(3+1)
	ENGLISH-II	PMS-610	2(2+0)
	ISLAMIC STUDIES	PMS-611	2(2+0)
			16
Third	GENERAL PATHOLOGY-I	PMS-612	3(2+1)
	PHARMACOLOGY-I	PMS-614	3(2+1)
	COMMUNICATION SKILLS	PMS-615	2(1+1)
	MEDICAL MICROBIOLOGY-I	PMS-613	3(2+1)
	DENTAL MATERIALS-I	DEN-601	3(2+1)
	ORAL HISTOLOGY	DEN-602	3(2+1)
			17
Fourth	BEHAVIORAL SCIENCES	PMS-619	2(2+0)
	TOOTH MORPHOLOGY	DEN-603	3(2+1)
	DENTAL MATERIALS-II	DEN-604	3(2+1)
	PERIODONTOLOGY	DEN-605	3(2+1)
	ORAL PATHOLOGY AND ORAL MEDICINE-I	DEN-606	3(2+1)
	PHARMACOLOGY- II	PMS-616	3(2+1)
			17

Fifth	PARTIAL DENTURE PROSTHODONTICS	DEN-607	3(2+1)
	ORAL PATHOLOGY AND ORAL MEDICINE-II	DEN-608	3(2+1)
	MINOR ORAL SURGERY-I	DEN-609	3(2+1)
	COMMUNITY & PREVENTIVE DENTISTRY	DEN-610	3(2+1)
	FUNDAMENTALS OF ORAL AND MAXILLOFACIAL RADIOLOGY	DEN-611	3(2+1)
	OPERATIVE DENTISTRY	DEN-612	3(2+1)
			18
Sixth			
	FUNDAMENTALS OF IMPLANTOLOGY	DEN-619	3(2+1)
	MINOR ORAL SURGERY-II	DEN-621	3(2+1)
	ENDODONTICS	DEN-613	3(2+1)
	COMPLETE DENTURE PROSTHODONTICS	DEN-614	3(2+1)
	ORTHODONTICS-I	DEN-615	3(2+1)
	PAEDIATRIC DENTISTRY	DEN-616	3(2+1)
			18
Seventh	ORTHODONTICS-II	DEN-617	3(2+1)
	FIXED PROSTHODONTICS	DEN-618	3(2+1)
	BIOSTATISTICS	PMS-622	3(2+1)
	FUNDAMENTAL OF INFECTION CONTROL	PMS-624	2(1+1)
	EPIDEMIOLOGY	PMS-623	3(2+1)
	RESEARCH METHODOLOGY	PMS-621	3(2+1)
			17
Eight	RESEARCH PROJECT	PMS-626	6
	SEMINAR	PMS-627	1
	BIOETHICS	PMS- 625	2(2+0)
	MAXILLOFACIAL PROSTHODONTICS	DEN-622	3(2+1)
	MEDICAL EMERGENCIES IN DENTAL PRACTICE	DEN-620	3(2+1)

			15
	TOTAL CREDIT HOURS		136

Total credit hours= 136

HEC recommendation=124-136

1st SEMESTER COURSES

- 1. MEDICAL BIOCHEMISTRY-I**
- 2. HUMANPHYSIOLOGY-I**
- 3. HUMANANATOMY-I**
- 4. ENGLISH-I**
- 5. PAKSTUDIES**
- 6. COMPUTERSKILLS**

Course objectives:

- To understand the chemical composition, biochemical role, digestion and absorption of macro and micro molecules of the cell.
- To understand different biochemical reactions in cell.
- To understand mechanism of action of hormones.

Course contents:

Acids, bases, pH and buffers, Biochemical composition and functions of the cell membrane, Transport across the cell membrane, Carbohydrates: Introduction, structure, function, digestion and absorption, Amino acids and proteins: Introduction, structure, function, digestion and absorption, Lipids: Introduction, structure, function, digestion and absorption, Vitamins and minerals, Fluid, electrolyte and acid base balance, Cell signaling and hormone action, Body secretions: Composition and function of saliva, gastric acid (HCL), pancreatic juice, bile, hormones and GI functions

Practical's:

1. Blood sample collection for Biochemical analysis
2. Preparation and calculation of Solutions
3. Principles of Biochemistry analyzers (spectrophotometer, flame photometer)
4. Determination of Cholesterol, TG, HDL, LDL, sugar, calcium and phosphorus in blood

Recommended Books

- Harper's Biochemistry Robert K. Murray, Daryl K. Graner 28th edition 2009
- Biochemistry by Dr. U. Satyanarayana, UChakrapani
Lehninger Principles of Biochemistry, 6E
Marks' Essentials of Medical Biochemistry A Clinical Approach,
Second Edition

Course Objectives:

- To understand the basic concepts of physiology beginning from the cell organization to organ system function.
- To understand the organization of cell, tissue organ and system with respect to their functions.
- To Understand the physiology of Respiration, G.I.T, Urinary system and Endocrine system

Course contents:

Functional organization of human body, Mechanism of Homeostasis, Cell structure and its function, function of different Tissue, Functions of the skin, , Types and function of muscle, Neuromuscular junction, functions of the endocrine glands, Breathing Mechanism, Exchange of respiratory Gaseous, Transport of respiratory gases, Function of different part of Digestive system, Function of liver and pancreas, Digestion and Absorption in Gastrointestinal tract, Patho-Physiology of Gastrointestinal Disorders, Formation of Urine by the Kidney, Glomerular filtration, Renal and associated mechanism for controlling ECF, Regulation of Acid-Base Balance, Male Reproductive System (Male), Prostate gland, Spermatogenesis, Female Reproductive System, Menstrual Cycle and Pregnancy and parturition, Mammary Glands and Lactation and Fertility Control

Practical's:

1. Introduction to microscope
2. Bleeding time
3. Clotting time
4. WBCs count
5. RBCs count
6. Platelets count
7. Reticulocytes count

Recommended Books:

- Essentials of Medical Physiology K Sembulingam, Prema Sembulingam Sixth Edition 2013
- Concise Physiology Dr. Raja Shahzad 1st Edition 2012
- Guyton And Hall Textbook of Medical Physiology John E. Hall, Arthur C. Guyton Professor and Chair 2006
- Ross and Wilson Anatomy and Physiology in Health and Illness 11th Edition Anne Waugh, Allison Grant 2010

Course Objectives:

- To understand the basic concepts of anatomy beginning from the cell organization to organ system function
- To understand the basic concepts of general anatomy including skeleton and musculoskeletal.
- To Understand the anatomy of Thorax Abdomen and pelvis

Course contents:

Musculo skeletal system (Axial and Appendicular), Axial Skeleton, Different bones of human body, Axial and Appendicular Skeleton, Classification on the basis of development, region and function, General concept of ossification of bones, parts young bone, Blood supply of long bones. Joints Structural Regional and functional classification of joints, Characteristics of synovial joints, Classification of synovial joints, Movements of synovial joints. Muscular System Parts of muscle Classification of muscles (skeletal, Cardiac, smooth) Thoracic wall: Muscles of thorax, Surface Anatomy, Trachea, lungs, pleura, mammary glands (breast), Heart and thoracic vessels. Thoracic cavity: Mediastinum, Lungs, bronchi, blood supply and lymphatic Abdominal wall: Skin, nerve and blood supply, Muscles of anterior abdominal wall. Abdominal cavity: General Arrangement of the Abdominal Viscera, Peritoneum, Omenta, mesenteries, Stomach, blood, nerve, lymphatic supply, small intestine, blood, nervous and lymphatic supply, Large intestine: blood nerve and lymphatic supply. The pelvic wall: Anterior, posterior wall, diaphragm. Pelvic cavity: Ureters, urinary bladder Male genital organs, Female genital organs, Muscles of pelvic region, blood supply, nerve supply.

Practical's:

1. Study Axial and Appendicular skeleton on human Skeletal model.
2. Study musculoskeletal system on human Musculo Skeletal model.
3. Study organs of Special senses.
4. Study and understand anatomy of Thorax, Abdomen and Pelvis through:
5. Human Models
6. Video demonstration.

Recommended Books:

- Ross and Wilson Anatomy and Physiology in health and illness 11th Edition Waugh Grant.
- Clinical Anatomy (By regions) 9th edition, Richard Snell.

Reference books:

- Netter Atlas of human anatomy 5th Edition Saunders.
- Gray's Anatomy for student's 2nd Edition Drake Vogel Mitchell.

Course Objective:

- To enable the students to meet their real-life communication needs
- To enhance language skills and develop critical thinking

Course Contents:

Vocabulary Building Skills: Antonyms, Synonyms, Homonyms, One word Substitute, Prefixes and suffixes, Idioms and phrasal verbs, Logical connectors, Check spellings, Practical Grammar & Writing Skill: Parts of Speech, Tenses, Paragraph writing: Practice in writing a good, unified and coherent paragraph, Précis writing and comprehension, Translation skills: Urdu to English, Reading skills: Skimming and scanning, intensive and extensive, and speed reading, summary and comprehension Paragraphs, Presentation skills: Developing, Oral Presentation skill, Personality development (emphasis on content, style and pronunciation)

Recommended books:

- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press 1986. ISBN 0 19 4313506.
- Reading. Advanced. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1991. ISBN 0 19 4534030.

Course Objectives:

- To develop vision of Historical Perspective, Government, Politics, Contemporary Pakistan, ideological background of Pakistan.
- To study the process of governance, national development, issues arising in the modern age and posing challenges to Pakistan.

Course Contents:

Historical Perspective: Ideological rationale with special reference to Sir Syed Ahmed Khan, Allamah Muhammad Iqbal and Quaid-e-Azam Muhammad Ali Jinnah, Factors leading to Muslim separatism, People and Land, Indus Civilization, Muslim advent, Location and Geo-Physical features. Government and Politics in Pakistan, Political and constitutional phases:1947-58,1958-71,1971-77,1977-88,1988-99,1999 onward Contemporary Pakistan: Economic institutions and issues, Society and social structure, Ethnicity, Foreign policy of Pakistan and challenges, Futuristic outlook of Pakistan.

Books Recommended:

- Akbar, S. Zaidi. *Issue in Pakistan's Economy*. Karachi: Oxford University Press,2000.
- Mehmood, Safdar. *Pakistan Kayyun Toota*, Lahore: Idara-e-Saqafat-e-Islamia, Club Road, Nd.
- Amin, Tahir. *Ethnos - National Movement in Pakistan*, Islamabad: Institute of Policy Studies, Islamabad.
- Afzal, M. Rafique. *Political Parties in Pakistan*, Vol. I, II & III. Islamabad: National Institute of Historical and cultural Research,1998.

Course objectives:

- To understand the basic of computer
- To utilize the MS office, internet and email

Course Contents:

Introduction to Computer and Window XP/7; MS Office 2007 (Word, Excel, PowerPoint); Internet access and different data bases available on the internet; Email.

Recommended Books:

- Computer science by Muhammad Ashraf, edition 1st2010

2nd SEMETER COURSES

- **BIOCHEMISTRY-II**
- **HUMANPHYSIOLOGY-II**
- **HUMANANATOMY-II**
- **ENGLISH-II**
- **ISLAMICSTUDIES**

Course objective:

By the end of this course the students of BS technology will be able to:

- Discuss the basic concept of biomolecules and its metabolism in human body
- Describe the significance of various enzymes and hormones in human body
- Demonstrate various enzymes and hormones on biochemistry analyzer and interpret its result for the diagnosis and monitoring

Content:

Carbohydrates metabolism (Glycolysis, Glycogenolysis, Gluconeogenesis, Glycogenesis, Pentose phosphate pathway, Fermentation and ethanol metabolism, Krebs cycle, ETC, Cori cycle, Glucose alanine cycle), Protein and amino acids metabolism (synthesis and degradation of amino acids, Lipid metabolism (Beta oxidation, Cholesterol metabolism), Nucleotide metabolism (Purine and pyrimidine degradation, uric acid formation), Nutrition (Major food groups, Balanced diet , Metabolic changes in starvation, Protein energy malnutrition, Obesity, kwashiorkor, Marasmus), Clinical diagnostic enzymology: clinical significance of ALT, AST, ALP, GGT, LDH and isoenzymes, CK and isoenzymes, Pancreatic lipase and amylase, cholinesterase, G6PD, ACP, cardiac troponins, ANP, BNP and pro-BNP)

Practical:

- Determination of liver, cardiac, pancreatic enzymes
- Determination of urea and uric acid
- Demonstration of ELISA, CMIA and CLIA instrument

Books:

Biochemistry by Dr. U. Satyanarayana, U Chakrapani

Marks' Essentials of Medical Biochemistry A Clinical Approach, Second Edition

Harper's Illustrated Biochemistry a LANGE medical book twenty-sixth edition

Lehninger Principles of Biochemistry, 6E

Mc Graw Hill's Manual of laboratory and diagnostic tests by DENISE D. WILSON, PHD, APN, FNP, ANP

Course Objectives:

- To understand the basic concepts of physiology beginning from the organization of the systems to their role in the body.
- Understand the organization and function of various systems
- Understand the physiology of Blood, CVS, Nervous System and special senses
- Students will be able to understand immunity, its types and immune reactions

Course Contents:

Physiology of Nervous System, Function of various cranial nerves, Functions of somatic motor nervous system Functions of the autonomic nervous system, function of neurons, neuroglial cells and their components. Resting membrane potential and an action potential, function of a synapse and reflex arc, functions of the specialized sense organs: Eye, physiology of site, accommodation, optic nerve and optic chiasma, Ear, functions of the internal, middle and external ear Physiology of the hearing and balance, Smell, physiology of olfactory nerve. Taste, physiology of taste Location of the taste buds Physiology of speech, Blood: Composition and function of Blood , hematopoiesis, Blood grouping, Coagulation mechanism, Physiology of Cardiovascular system The Physiology of Pulmonary Systemic Circulation: Arteries Veins Local Control of Blood Vessels Nervous Control of Blood Vessels Regulation of Arterial Pressure, The function of Lymphatic System, tonsils, lymph nodes, the spleen and the thymus, Classification and physiology of Immune system, Antigens and Antibodies, Primary and secondary responses to an antigen Antibody- mediated immunity and cell-mediated immunity Role of lymphocyte in immunity regulation.

Practical's

1. Spirometry
2. Electrocardiography
3. Blood Pressure Measurement.
4. Normal and abnormal ECG interpretation.
5. Pulse rate measurement
6. Heart sounds

Recommended Books

- Essentials of Medical Physiology K Sembulingam, Prema Sembulingam Sixth Edition 2013
- Guyton And Hall Textbook Of Medical Physiology John E Hall, Arthur C. Guyton Professor and Chair 2006
- Ross and Wilson Anatomy and Physiology in Health And Illness 11th Edition Anne Waugh, Allison Grant 2010

Course Objectives:

- To understand the basic concepts of anatomy beginning from the cell organization to organs system function
- To understand the anatomy of upper limb, lower limb and head and neck.
- To understand the knowledge about endocrine system

Course contents:

The upper limb Bones of shoulder girdle and Arm, Muscles, Axilla, Brachial plexus, Cubital fossa, the forearm, hand bones, muscles, Blood supply, Nerve supply, lymphatics, The lower limb Fascia, Bones, Muscles, Femoral triangle, Blood supply, Nerve supply, Lymphatic supply. Head and neck Skull, Mandible, Cranial nerves, cranial cavity, Meninges, Brain, Orbit, Neck, Endocrine System Classification of endocrine glands, Pituitary glands, Thyroid Glands, Adrenal gland and differences between the cortex and medulla.

Practical's:

Study and understand the anatomy of Upper limb, Lower limb, Head and Neck through:

1. Human Models.
2. Video demonstration
3. Study radiographs of upper and lower limb.

Recommended Books:**Essential books** (text books)

- Ross and Wilson Anatomy and Physiology in health and illness 11th Edition Waugh Grant.
- Clinical Anatomy (By regions) 9th edition, Richard S. Snell.

Reference books

- Netter Atlas of human anatomy 5th Edition Saunders.
- Gray's Anatomy for students 2nd Edition Drake Vogel Mitchell.
- BD. Chourasia Human Anatomy (Allregions)

Course Objectives:

- To enhance students writing, reading and listening skills.
- To enhance language skills and develop critical thinking.

Course contents:

Writing Skill: CV and job application, Technical Report writing, Writing styles, Changing narration: Converting a dialogue into a report, Converting a story into a news report, Converting a graph or picture into a short report or story, Active and Passive voice, Letter / memo writing and minutes of the meeting, use of library and internet resources, Essay writing, Phrases - Types and functions, Clauses - Types and functions, Punctuation: Tenses - Types, Structure, Function, Conversion into negative and interrogative. Speaking Skill: Group Discussion (Various topics given by the teacher), Presentation by the students (individually), Role Play Activities for improving Speaking. Listening Skill: Listening Various Documentaries, Movies, and online listening activities to improve the listening as well as pronunciation of the words.

Recommended Books:

- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press 1986. ISBN 0 19 4313506.
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 1. Third edition. Oxford University Press. 1997. ISBN0194313492.
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press. 1997. ISBN0194313506
- Intermediate by Marie-Christine Boutin, Suzanne Brinand and Francoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 0 19 435405 7 Pages 20-27 and 35-41.
- Reading. Upper Intermediate. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1992. ISBN 0 19 4534022.

Course Objectives:

- To learn about Islam and its application in day-to-day life.
- To provide Basic information about Islamic Studies
- To enhance understanding of the students regarding Islamic Civilization
- To improve Students skill to perform prayers and other worships
- To enhance the skill of the students for understanding of issues related to faith and religious life.

Course contents:

Fundamental beliefs of Islam, Belief of Towhead, Belief in Prophet hood, Belief in the Day of Judgment, Worships, Salaat / Prayer, Zakat /Obligatory Charity, Suam / Fasting, Hajj / Pilgrimage, Jihad, Importance of Paramedics In Islam, Ethics, Religion and Ethics, Higher Intents / Objectives of Islamic Sharia and Human Health, Importance and Virtues of Medical Profession, Contribution and Achievements of Muslim Doctors, Knowledge of the Rights, Wisdom and Prudence, Sympathy /Empathy, Responsible Life, Patience, Humbleness, Self Respect, Forgiveness, Kindhearted, Beneficence, Self Confidence, Observing Promise, Equality, Relation among the Doctors, Jealousy, Backbiting, Envy, Etiquettes of Gathering, Relation between a Doctor and a Patient, Gentle Speaking, Mercy and Affection, Consoling the Patient, To inquire the health of Patient, Character building of the Patient, Responsibilities of a Doctor,

Recommended Books:

- Islamiyat (Compulsory) for Khyber Medical University, Medical Colleges and Allied Institutes

3rd Semester Courses

- 1. PATHOLOGY-I**
- 2. PHARMACOLOGY-1**
- 3. COMMUNICATIONSKILLS**
- 4. MEDICALMICROBIOLOGY-I**
- 5. DENTALLATERIALS-I**
- 6. ORALHISTOLOGY**

Course Objectives:

- To understand different pathological processes.
- To the processes blood coagulation and embolism
- To understand the mechanism of wound healing and regeneration

Course Contents:

Introduction to pathology, Cell injury, Cellular adaptation, Acute Inflammation, Chronic Inflammation, Cell Repair & Wound Healing, Regeneration & Repair, Hemodynamic Disorders, Edema, Hemorrhage, Thrombosis, Embolism, Infarction & Hyperemia, Shock, compensatory mechanism of shock, possible consequences of thrombosis & difference between arterial & venous emboli, Neoplasia, Dysplasia, benign and malignant neoplasms, metastasis

Practical's:

1. Estimation of Prothrombin Time
2. Estimation of Clotting Time
3. Estimation of Bleeding Time
4. Estimation of Activated Partial Thromboplastin Time

Recommended Books:

- Robbins Basic Pathology Kumar Abbas Aster 9th Edition 2013
- Review Of General Pathology Moh. Firdaus 9th Edition
- Short Text Book of Pathology Moh. Inam Danish 3rd Edition 2006

Course Objectives:

By the end of semester students will be able to:

- Define common terms related to pharmacology and drug therapy.
- Discuss relevant historical, legal, and ethical issues related to pharmacology and drug therapy.

Course Contents:

Introduction to Pharmacology, Pharmacokinetics, Pharmacodynamics, Adverse effects of drugs, Classification of drugs, Drugs affecting the Autonomic Nervous System, NSAID, Opioids, Drugs Affecting Endocrine system (Corticosteroids, Thyroid and Anti Thyroid), Gastrointestinal Drugs (PPI, H₂ blockers and Antacids), Anti-Histamines, Anesthetics (General and local anesthetics),

Practical: 1. Introduction to drug dosage form 2. Study of the action of drugs (Atropine) on the rabbit's eye

Recommended books:

Lippincott's pharmacology (text book) by Mycek 6th Edition published by Lippincott Raven 2012.
□ Katzung textbook of pharmacology (Reference Book) by Bertram Katzung 12th Edition, Published by Appleton.

Course Objectives

By the end of the course students will be able to:

- Communicate effectively both verbally and non-verbally
- Apply the requisite academic communication skills in their essay writing and other forms of academic writing
- Use various computer-mediated communication platforms in their academic and professional work
- Relate to the interpersonal and organizational dynamics that affect effective communication in organizations.

Course contents:

Introduction to Communication , Meaning and definition of Communication, The process of communication, Models of communication, Effective Communications in Business, Importance and Benefits of effective communication, Components of Communication, Communication barriers, Non verbal communication, Principles of effective communication, Seven Cs, Communication for academic purposes, Introduction to academic writing, Summarizing, paraphrasing and argumentation skills, Textual cohesion, Communication in Organizations, Formal communication networks in organizations, Informal communication networks, Computer- mediated communication (videoconferencing, internet, e-mail, skype, groupware, etc.), Business Writing , Memos, Letters, Reports, Proposals, Circulars, Public Speaking and Presentation skills, Effective public presentation skills, Audience analysis, Effective argumentation skills, Interview skills.

Recommended Books:

- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press 1986. ISBN 0 19 4313506.
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 1. Third edition. Oxford University Press. 1997. ISBN0194313492.
- Practical English Grammar by A.J. Thomson and A.V. Martinet. Exercises 2. Third edition. Oxford University Press. 1997. ISBN0194313506
- Intermediate by Marie-Christine Boutin, Suzanne Brinand and Francoise Grellet. Oxford Supplementary Skills. Fourth Impression 1993. ISBN 0 19 435405 7 Pages 20-27 and 35-41.
- Reading. Upper Intermediate. Brian Tomlinson and Rod Ellis. Oxford Supplementary Skills. Third Impression 1992. ISBN 0 19 4534022.

Course objectives:

- To introduce the students with basic concepts in bacteriology and mycology.
- To introduce the students with common bacterial and fungal infections.
- To introduce the students with diagnosis of common bacterial and fungal infections.

Course contents:

Historical review and scope of microbiology, sterilization, disinfection and antisepsis, structure and function of prokaryotic cell, difference between prokaryotic and eukaryotic cell, bacterial growth and metabolism, bacterial classification, normal microbial flora of human body, mechanism of bacterial pathogenesis, host parasite interaction, Immune response to infection, common bacterial pathogen prevailing in Pakistan, introduction to fungi, fungal characteristic, morphology, structure, replication and classification, mechanism of fungal pathogenesis, common fungal pathogen prevailing in Pakistan.

Practical:

1. Introduction and demonstration of Laboratory Equipment's used in Microbiology.
2. Inoculation and isolation of pure bacterial culture and its antibiotic susceptibility testing.
3. Demonstration of different types of physical and chemical methods of sterilization, and disinfection.
4. Students should be thorough to work with compound microscope.
5. Detection of motility: Hanging drop examinations with motile bacteria, non-motile bacteria.
6. Simple staining methods of pure culture and mixed culture
7. Gram's staining of pure culture and mixed culture
8. AFB staining of Normal smear, AFB positives smear
9. KOH preparation for fungal hyphae.
10. Germ tube test for yeast identification.
11. Gram stain for candida.

Recommended books:

- Sherris Medical Microbiology: An Introduction to Infectious Diseases. Ryan, K. J., Ray, C. G., 4th ed. McGraw-Hill,2003.
- Clinical Microbiology Made Ridiculously Simple. Gladwin, M.,& Trattler, B., 3rd ed. Med Master, 2004.
- Medical Microbiology and Infection at a Glance. Gillespie, S., H., Bamford, K., B., 4th ed. Wiley-Blackwell,2012.
- Medical Microbiology, Kayser, F., H., & Bienz, K., A., Thieme,2005.
- Review of Medical Microbiology and Immunology. Levinson, W., 10th ed. McGraw Hill Professional,2008.

- Jawetz, Melnick, & Adelberg's Medical Microbiology. Brooks, G., Carroll, K., C., Butel, J., & Morse, S., 26th ed. McGraw-Hill Medical, 2012.

Course Objectives:

By the end of semester students will be able to:

- Describe properties and manipulation of different impression materials
- How to take impression with different impression materials
- Differentiate different types of dental materials

Course Content:

Properties of dental materials, Classification of impression materials, Dental plasters, Plastic impression compound, zinc oxide eugenol, Elastic hydrocolloids, Elastomers, Addition silicones, condensation silicones, Gypsum products, Dental waxes, Dental investments, Gypsum bonded investment, silicone bonded, phosphate bonded investment, Base metal alloys, Gold alloys, Soldering and welding, Casting

Practical:

1. Identification of dental materials
2. Manipulation of dental plasters
3. Manipulation of impression materials
4. Identification of different waxes
5. Identification of different casting techniques

Recommended Books:

- Basic dental materials by John Jay Manapalil, 2nd edition Jaypee
- Essentials of dental materials SH Sotratur, 1st edition Jaypee
- Applied dental materials by John F McCabe and Angus W.G. Walls, 9th edition Blackwell publishing Ltd.
- Dental biomaterials by Zohaib Khursheid and Zeshan Sheikh, 2nd edition paramount books

Course objectives:

By the end of semester students will be able to:

- To describe structure and composition of enamel, dentin-pulp complex and periodontium
- To explain development of tooth and its supporting structures

Course Content:

Structure of oral tissues, Development of mandible and maxilla, Development of tooth and its Supporting structures, Composition of enamel, Formation of enamel, Structure of enamel, Structure, composition and formation of dentin-pulp complex. Composition, formation and structure of periodontium, Physiological tooth movement, Shedding of teeth, eruption of teeth, Function of saliva, Histology of major and minor Salivary glands, Functions of oral mucosa, Structure of oral mucosa,

Practical:

1. Microscopic slides and images of enamel and dentine
2. Explaining the structural organization of oral tissues

Recommended Books:

1. Ten Cates's oral histology: Development, structure and function by Antonio Nanci Elsevier Health Sciences
2. Orban's Oral Histology and Embryology, Bhaskar S.: 11th edition, 1991, Mosby.
3. Fundamentals of Oral Histology and Physiology by R. Hand, Marion E. Frank Wiley-Blackwell
4. Textbook of Dental and Oral Histology with Embryology and Multiple Choice Questions by Chandra Girish, Chandra Mithilesh, Chandra Nidhee, Chandra Satish, Chandra Shaleen Edition 2/e Jaypee

4th Semester Courses

- 1. BEHAVIORAL SCIENCES**
- 2. TOOTHMORPHOLOGY**
- 3. DENTAL MATERIALS-II**
- 4. PERIODONTOLOGY**
- 5. ORAL PATHOLOGY AND ORAL MEDICINE I**
- 6. PHARMACOLOGY-II**

Course Objectives

- Conducting diagnostic interviews
- Formulating and clarifying diagnostic findings and treatment recommendations
- Documenting evaluation and treatment procedures, involving duties such as recording results of diagnostic interviews, lab studies, and/or treatment plans in a timely way according to the medical records protocols of the rotation site

Course Contents:

Introduction to Behavioral Sciences and its importance in health: Bio-Psycho-Social Model of Health Care and the Systems Approach, Normality vs Abnormality, Importance of Behavioral sciences in health, Desirable Attitudes in Health Professionals Understanding Behavior: Sensation and sense organs, Perception, Attention and concentration, Memory, Thinking, Communication, Individual Differences: Personality, Intelligence, Emotions, Motivation, Learning, Stress and Stressors, Life Events, Stress, Management, Interviewing / Psychosocial History Taking, Allied Health Ethics-Hippocratic oath, Culture and Allied Health practice, Psychological reactions, Breaking Bad News, Pain, Sleep, Consciousness.

Recommended Books:

- Behavioral Sciences by M.H Rana 2007, edition 5th
- Sociology in a Changing World by William Kornblum 8th edition 2007
- Changing Behavior: Immediately Transform Your Relationships with Easy-to-Learn, Proven Communication Skills by Georgiana Donadio 2011, edition 5th

Course Objectives:

By the end of the semester students will be able to:

- Differentiate between primary and permanent dentition
- Describe general characteristics of permanent maxillary and mandibular teeth

Course Content:

General characteristics of permanent maxillary and mandibular central incisor, lateral incisor, first premolar, Second premolar, first molar, second molar, third molar, general characteristics of deciduous teeth

Practical's :

1. Identification of important landmarks of Teeth on study models
2. Diagram sketching of various teeth

Recommended Book:

- Dental Functional Morphology By Peter W. Lucas, Cambridge University Press
- Dental Morphology: An Illustrated Guide by G. C. Van Beek BDS(Brist) (Author) Butterworth-Heinemann; 2 edition (27 Jan. 1983)
- Dental Anatomy and Tooth Morphology by P. Sampath Kumar (Author) JPB (2007)
- Concise Dental Anatomy and Morphology 4th Edition by James L. Fuller (Author)

Course Objectives:

By the end of this course students will be able to:

- Describe composition and manipulation of different filling materials.

Course Content:

Tooth cutting materials, Different types of burs, Finishing and polishing materials, Ceramics, Dental cements, Zinc oxide eugenol cement, zinc phosphate cement, Zinc poly carboxylate cement, Calcium hydroxide cement, Silicate cement, Glass ionomer cement, Direct filling gold, Properties and composition of Dental amalgam, Manipulation of dental amalgam, lining materials, Denture base resins, Composition and manipulation of acrylic resins, Composite resins

Practical:

1. Identify different shapes of burs
2. Identify diamond and carbide burs.
3. Manipulation of ceramics
4. Manipulation of dental cements
5. Manipulation of resins

Recommended Books:

- Basic Dental Materials by John J. Manappallil, 2nd edition, Jaypee
- Essentials of dental materials by SH Soratur, 1st edition, Jaypee
- Applied Dental Materials by Jhon F. McCabe and Angus W.G. Walls 9th edition, Blackwell publishing Ltd.
- Dental Biomaterials by Zohaib Khurshid and Zeeshan Sheikh, 2nd edition, paramount Books

DEN-605 PERIODONTOLOGY Credit Hours: 3(2+1)

Course objectives:

By the end of the semester students will be able to:

- Describe etiology and classification of periodontal diseases
- Diagnose different periodontal diseases.

Course Contents:

Anatomy of periodontium, Basic etiology of periodontal disease, Classification of periodontal diseases, Gingivitis, Gingival enlargement, Periodontitis, Early onset periodontitis, Gingival recession, Occlusal Trauma, Pericoronitis, Gingival abscess, Periodontal examination, diagnosis, prognosis and treatment plan, Plaque control in periodontal therapy

Practical:

- Hospital based scaling and polishing.

Recommended Book:

1. A Text Book Of Clinical Periodontology By JanLindhe
2. Essentials Of Periodontology ByElizabeth

DEN-606 ORAL PATHOLOGY AND ORAL MEDICINE -I Credit Hours: 3(2+1)

Course Objectives:

By the end of the semester students will be able to:

- Describe different disorders of teeth and supporting structures
- Interpret pathological changes clinically and radiographically

Course Outlines:

Disorders of development of teeth, Dental caries, disorders of dental pulp, disorders of Periodontium, cysts of jaws and oral tissues, diseases of salivary glands, disorders of bone, diseases of temporo-mandibular joint, , Diseases of the oral mucosa: Non-infective stomatitis, Tongue disorders, Common benign mucosal swellings.

Practical:

- Identification of slides of different oral pathologies
- Visit to maxillofacial ward to observe patients with oral pathologies and their management along with history taking

Recommended Book:

- Textbook of Oral Pathology by Sanjay Saraf, Jaypee Brothers Publishers
- Clinical Outline of Oral Pathology, 4th Edition by Lewis R. Eversole (Author) Pmph USA
- Cawson's Essentials of Oral Pathology and Oral Medicine, 8e 8th Edition by Roderick A. Cawson, Churchill Livingstone

Course objectives:

To provide quality patient care in routine as well as advanced procedures.

To understand the mechanism of drug action at molecular as well as cellular level, both desirable and adverse.

To understand the principles of pharmacokinetics i.e. drug absorption, distribution, metabolism and excretion and be able to apply these principles in therapeutic practice.

Course contents:

Drugs acting on cardiovascular system; Drugs for heart failure, anti-hypertensive drugs, antianginal drugs, Anti Hyperlipidemic drugs, Blood drugs(Anticoagulants), Diuretics, Chemotherapeutics drugs([Anti- protozoal, Anti-Malarial], Anti-Fungal, Anthelmintic), Antibiotics(Penicillin's, cephalosporin's, macrolides, aminoglycosides, fluroquinolones), Drugs acting on Respiratory system(Asthma).

Practical:

1. Routes of drug administration 2. Study of action pilocarpine on rabbit eye.

Recommended books:

Lippincott s pharmacology (text book) by Mycek 6th Edition published by Lippincott Raven 2012.
Katzung textbook of pharmacology (Reference Book) by Bertram Katzung 12th Edition, Published by Appleton.

Fifth Semester

- 1. PARTIAL DENTURE PROSTHODONTICS**
- 2. ORAL PATHOLOGY AND ORAL MEDICINE -II**
- 3. MINOR ORALSURGERY-I**
- 4. COMMUNITY& PREVENTIVE DENTISTRY**
- 5. FUNDAMENTALS OF ORAL AND MAXILLOFICIAL RADIOLOGY**
- 6. OPERATIVE DENTISTRY**

Course objectives:

- To introduce students with basic concepts of prosthodontics
- To fabricate removable partial denture
- To describe functions and parts of articulator
- To describe indications and merits, demerits of immediate denture and over denture.

Course contents:

Introduction to prosthodontics, Biological and mechanical considerations of partial denture, component parts of partial Denture, Maxillary major connector, Mandibular major connector, Minor connectors, Direct retainers, Indirect retainers Denture base materials ,Materials of artificial teeth, Designing of partial denture, Surveying, Parts of surveyor, Selection Of major connector, Selection of denture base materials, Selection of artificial teeth, Arrangement of teeth, Try-In, Curing, Finishing and polishing , Insertion of partial denture, Over denture,

Practical:

- Surveying
- Designing
- Construction of wax pattern, spruing, investing, casting, finishing and polishing of metal framework
- Repair and relining and rebasing of partial denture

Recommended books:

- Boucher's Prosthodontics
- Fenn's Clinical Dental Prosthetics
- A Color Guide To Removable Partial Denture Design Davenport JC, BaskerRM, Heath JR, Ralph JP &Glantz

Objectives:

At the end of this module the students will be able:

- Interpret pathological changes clinically and radiographically
- Describe different oral lesions

Course contents:

Major infection of mouth , jaws and perioral tissue ,tumors, odontogenic ,odontogenic tumors and tumors like lesions of the jaws ,oral premalignancy ,oral cancers, common benign mucosal swellings ,soft tissues neoplasms , melanoma and other pigmented lesions.

Practical:

- Identification of slides of different oral pathologies
- Visit to maxillofacial ward to observe patients with oral pathologies and their management along with history taking.

Recommended Books:

- Textbook of Oral Pathology by Sanjay Saraf, Jaypee Brothers Publishers
- Clinical Outline of Oral Pathology, 4th Edition by Lewis R. Eversole (Author) Pmph USA
- Cawson's Essentials of Oral Pathology and Oral Medicine, 8e 8th Edition by Roderick A. Cawson, ChurchillLivingstone

Objectives:**At the end of this module the students will be able:**

- To understand the composition of Local Anesthesia
- To perform diagnostic procedures of minor oral surgery
- To administer the local anesthesia on patients.
- To know about infection control in surgical setup

Course contents:

History taking, Clinical examination, Clinical Evaluation, patient surgeon positions, chair positioning, principles of surgery, Wound repair, Infection control in surgical practice, Principles of routine exodontia, indications & contraindications, Instrumentations for basic oral surgery, Pharmacology of local anesthetics, Classification and Compositions, Administration of local anesthesia, Infiltration techniques, Nerve block techniques, Complications of local anesthesia

Practical:

- Administration of local anesthesia
- Instruments sterilization
- Extraction of primary teeth
- Simple extraction of permanent teeth

Recommended books:

- J Peterson, Tucker, Edward Ellis. Contemporary Oral & Maxillofacial surgery
- Hand book of local anesthesia by Stanley F. Malamed.

Course objectives:

To produce awareness towards dental problem of the community prior to occurrence

Course contents:

Basic concepts of health, disease and infection, Relationship of environment and health, Role of Nutrition in health and disease, Objectives and principles of health education, Epidemiological methods, Epidemiology of oral diseases, Prevention of oral diseases, primary preventive services, fluorides in caries Prevention.

Recommended books:

- Community Oral Health by Cynthia M.Pine
- Preventive Dentistry by John O.Forrest

Course objectives:

- To understand biology of radiation and radiation safety in dentistry along with the knowledge of radiologic techniques for procuring, exposing and developing dental films.
- Identification of the anatomical features and common pathology visible on dental radiographs
- Interpretation of dental radiographs as relevant to dentistry

Course contents:

Legislation and regulations relating to dental radiography and ionizing radiation, Dental x-ray tube and apparatus, ionizing radiation and its effects on body tissues hazards involved in dental radiography, and measures to be taken to protect patients and operator during the taking of radiographs, Knowledge of the different types of radiographs and their use e.g;

Periapical radiographs, Bitewing radiographs, Occlusal radiographs, PA view of skull, Lateral view, OPG, CEPH, Digital radiography, Identification of the anatomical features and common pathology visible on dental radiographs, Interpretation of dental radiographs as relevant to dentistry

Practical:

- a) The techniques for taking dental radiographs
- b) Preparation of developer and fixer solution
- c) Dry processing of radiographs
- d) The principles of processing dental radiographs and the faults which may occur,
- e) The importance of quality assurance in dental radiographs

Recommended books:

CLARK'S POSITIONING IN RADIOGRAPHY 12TH EDITION

A. Stewart Whitley Charles Sloane Graham Hoadley Adrian D. Moore Chrissie W. Alsop

COURSE OBJECTIVES:

- To introduce students with different moisture control methods
- To design cavity according J.V blacks classification
- To introduce cavity preparation for inlay and on lay wax

COURSE CONTENTS:

Assessment, examination, diagnosis and treatment planning of dental caries ,Fundamentals of tooth preparation ,Preliminary consideration for operative dentistry ,Direct tooth colored and non tooth, colored restorative materials, Composite, and Amalgam ,Class I,II and III cavity preparation ,Restorative failure ,Postoperative Problems.

PRACTICALS:

1. Cavity preparation on mounted teeth
2. Oral examination and treatment planning
3. Saliva control techniques (rubber dam)

RECOMMENDED BOOKS:

Operative Dentistry by M.A.Marzouk
Art and Science of Operative Dentistry by Sturtevant
Inlays Crowns and Bridges by Colin R Cowel
Introduction to Metal Ceramic Technology by W. Patrick Naylor
A Colour Atlas of Clinical Operative Dentistry, Crowns and Bridges 2nd Edition. Grundy and Glyn Jones
Resin Bonded Bridges Tay W-M

Sixth Semester

- 1. FUNDAMENTALS OF IMPLANTOLOGY**
- 2. MINOR ORAL SURGERY II**
- 3. COMPLETE DENTURE PROSTHODONTICS**
- 4. ORTHODONTICS I**
- 5. PEDIATRIC DENTISTRY**
- 6. ENDODONTICS**

DEN-619 FUNDAMENTALS OF IMPLANTOLOGY Credit Hours 3(2+1)

Objectives:

To introduce the students with the types and classification of implants
To describe implant placement.
To prepare implant supported prosthesis.

Course Content:

Introduction of dental implants, Types of implants, Subperiosteal implants, Endosteal implants, Osseointegration, Uses of dental implants, Planning of implants, Biomechanical considerations of implants, Main surgical procedures, placing the implant, Timing of implants after tooth extraction, Healing time, One stage surgery – two stage surgery, Immediate placement, Additional surgical procedures, Hard tissue reconstruction, Soft tissue reconstruction, Recovery, Prosthetic procedures for single teeth, bridges and fixed dentures, Prosthetic procedures for removable denture, Maintenance, Risks and complications.

Practical:

Practical demonstration of surgical procedures involved in placement of implants
Fabrication of implant supported prosthesis.

Recommended Books:

- Misch, Carl E (2007). Contemporary Implant Dentistry. St. Louis, Missouri: Mosby Elsevier.
- Balaji, S. M. (2007). Textbook of Oral and Maxillofacial Surgery. New Delhi: Elsevier India.

Objectives:

At the end of this module the students will be able:

- To describe diseases of oral cavity
- To perform diagnostic procedures of minor oral surgery
- To manage complications of minor oral surgical procedures

Course contents:

Tooth extraction, specific technique for removal of each tooth, modification for primary teeth extraction, principles of flap design & management, techniques for open extractions, multiple extractions, indications and contraindications of impacted teeth, classification for third molar impaction, removal of impacted teeth and surgical procedure, post-operative patient management, management of extraction complications, Management of dent alveolar fracture, extractions of broken down root, suturing, excision of mucocele, apicectomy, operculectomy, epulis removal, frenectomy biopsy taking.

Practical:

- Demonstration of patient and chair positioning
 - To perform of all minor oral surgical procedure
 - Extraction of Permanent teeth, impacted teeth
 - Post extraction management

Recommended Books:

- J Peterson, Tucker, Edward Ellis. Contemporary Oral & Maxillofacial surgery
- Oral and maxillofacial surgery by Kruger

OBJECTIVES:

Enables to diagnose dental caries lesion

Enables to form the tooth cavities according J.V black classification

Enables to know the properties and requirements of restorative material

COURSE CONTENTS:

Pulp therapy for the young permanent teeth , Apexification , Apexogenesis, Endodontics , Diagnostic Procedures, Clinical Classification of pulpal & Periapical disease ,Reversible pulpitis. Irreversible pulpitis. Acute apical periodontitis. Acute apical abscess ,Chronic apical periodontitis, Instruments , Internal Morphology & Access opening, Pulpectomy – diagnostic & working length, cleaning filing, shaping, Bio-mechanical canal preparation etc. , Irrigants & intra canal medicaments . Root canal sealers & obturation. Failures in endodontics, Endo – perio lesion, Internal, external resorption, Radiographic Analysis.

PRACTICALS_

- Access cavity preparation.
- Canal locations on mounted teeth.
- Root canal preparation and obturation steps on mounted teeth.

RECOMMENDED BOOKS:

Operative Dentistry by M.A.Marzouk

Art and Science of Operative Dentistry by Sturtevant Inlays Crowns and Bridges by Colin R Cowel

Introduction to Metal Ceramic Technology by W. Patrick Naylor

Endodontics - Problem Solving in Clinical Practice – Ford

Textbook of Endodontics, 3E Nisha & Amit Garg (2014)

Mastering Endodontic Instrumentation, John T. McSpadden, D.D.S. Cloudland Institute

DEN-614 Complete Denture Prosthodontics Credit Hours3(2+1)

Course objectives:

To describe steps involved in complete denture fabrication
To fabricate complete denture

Course contents:

Biomechanics of edentulous state. Tissue response to complete denture. Construction of special tray from primary impression construction of secondary denture base from secondary impression. Formation of occlusal wax rims articulators and articulation. Biological consideration in jaw relation and jaw movements biological consideration in vertical jaw relation. Biological consideration in horizontal jaw relation recording and transferring bases and occlusion rims. Relating the patient to articulator selection of artificial teeth for edentulous patient. Set up of teeth completion of try- in . laboratory procedures tooth supported complete denture. Single complete denture opposing natural teeth. Relining and rebasing of complete denture. Management of manufacturing defects repair of denture.

Practical:

- Construction of special tray from primary impression.
- Construction of permanent denture base from secondary impression
- Formation of occlusal wax rims
- Articulators and articulation
- Selection of teeth
- Set up of teeth
- Flasking, dewaxing and processing procedures
- Finishing and polishing techniques
- Relining and rebasing
- Immediate dentures

Recommended books:

- Boucher's Prosthodontics
- Fenn's Clinical Dental Prosthetics
- A Color Guide To Removable Partial Denture Design Davenport JC, Basker RM, Heath JR, Ralph JP & Glantz
- Removable Denture Construction. Bates JF, Huggett R & Stafford GD
- Over Dentures in General Dental Practice. Basker RM, Harrison A, Ralph JP & Watson C

Objectives:

At the end of this module the students will be able:

- To diagnose various malocclusions.
- To describe development of occlusion
- To understand removable orthodontic appliances.
- To describe Myofunctional orthodontic appliances
- To know preventive and interceptive procedures

Course contents:

Development of occlusion, classification and etiology of malocclusion, orthodontic diagnosis, parafunctional habits, general concept of orthodontic appliances, removable appliances, Myofunctional appliances, vestibular screen, activators, bionators, frankels appliances, inclined plan, headgear, space maintainers, interceptive orthodontics.

Practical:

- Laboratory procedures for different appliances
- Wire bending techniques
- Fabrication of Adams clasp, labial bows, springs and retractors
- Fabrication of Myofunctional appliances, Removable appliances

Recommended Books:

- Orthodontics, The art and science by S.I bhalajhi
- Orthodontics at a glance by Daljit Gill, Blackwell

Objectives;

1. To enable the dental therapist to perform the simple restorative procedure in children
2. To enhance the dental and oral status of children
3. Able to early detect caries in children and manage it.

Course Contents:

local anesthesia for children, diagnosis and prevention of dental caries, treatment of dental caries in the preschool child, operative treatment of dental caries in the primary dentition, operative treatment of dental caries in the young permanent dentition, advanced restorative dentistry in children's, periodontal disease in children, anomalies of tooth formation and eruption pulp therapy for primary teeth, one step and two step pulpotomy. Fissure sealants and fluoride applications, space management, space maintainers, splinting.

Practical;

1. Application of fluoride in primary teeth
2. Application of fissure sealant in primary teeth
3. Pulpotomy
4. Simple restorative procedures in primary teeth

References;

1. pediatric dentistry - 3rd ed. (2005) Richard Welbury, Monty Duggal
2. dentistry for the child by Ralph McDonald

Seventh Semester

- 1. BIostatISTICS**
- 2. EPIDEMIOLOGY**
- 3. RESEARCH METHODOLOGY**
- 4. FUNDAMENTAL OF INFECTION CONTROL**
- 5. FIXED PROSTHODONTICS**
- 6. ORTHODONTICS-II**

Course objectives:

By end of this course the students will be able to:

- Explain epidemiological terminologies
- Apply the knowledge to Calculate disease risk, prevalence, and incidence
- Select and choose an appropriate study design for epidemiological research
- Explain the confounding and Biases in research studies

Course Contents:

Introduction to Epidemiology and basic terms used in Epidemiology, Epidemiological Triangle, Measures of Disease Occurrence; Incidence and Prevalence, Dynamics of disease transmission, Measurement of disease frequency, risk, rate, ratio, and proportion, Calculation of Mortality and Morbidity, Study Design/Study type i.e. Cross-sectional, analytical cross-sectional, case-control, cohort, case report, case series, RCT, quasi-experiment, survey, and surveillance, Confounding and Biases, Odds ratio and relative risk, Screening and diagnosis, Validity, Reliability, Components of validity: sensitivity and specificity, PPV, and NPV of tests.

Practical Work:

- Calculation of Sensitivity and specificity
- Calculation of Incidence and prevalence
- Finding risk of disease, rate and frequency

Recommended Books:

- 1.An_Introduction_to_Epidemiology_for_Health_Professionals

Epidemiology by Leon Gordis 5th Edition

Course Objectives:

By the end of this course the students will be able to:

- Write a problem statement and research question
- Develop research proposal/synopsis
- Design data collection tools
- Write research project report/thesis
- Disseminate/publish their research findings

Course Contents:

Introduction to research, Types of research; Qualitative and Quantitative Research, Identification of Problem and Problem statement writing or Research question writing, Literature Search and review, Basics of Scientific writing, Synopsis/Proposal writing, Designing of data collection tools i.e. questionnaire, interview, and survey, Ethical principles of Research and their examples to apply those principles, Writing of research report (Abstract, Introduction, Methodology, Results, Discussion, Conclusion), In-text citation and reference writing, reference writing software i.e. Mendley, Plagiarism, Authorship, Introduction to Scientific Journal, how to target journal, Types of Publications i.e. Original article, Narrative and systematic review, meta-analysis, Editorial, letter to the editor

Practical Work:

- Literature Search
- Survey conduct
- Citation and Referencing
- Proposal writing
- Data collection and displaying

Recommended Books:

- Research Methodology by Ranjit Kumar 3rd Edition
- Foundation of Clinical Research by Portney LG Walkais MP in 1993, Publisher by Appleton and lauge USA
- A guide to Research Methodology, Biostatistics and Medical writing by college of physicians and surgeons Pakistan by WHO collaboration center
- Health system research project by Corlien M Varkerisser, Indra Pathmanathan, Ann Brownlee in 1993 by International Development Research Center in New Dehli, Singapore.

Objectives:

At the end of this module the students will be able:

- To demonstrate various fixed orthodontic appliances.
- To plan treatment planning for some common malocclusion.
- To understand different lab procedures related to fixed orthodontics like soldering and welding etc.

Course contents:

Cephalometric, types, uses, landmarks, soft tissue land marks, line and planes, down analysis Model analysis, Carrey's analysis and Bolton's analysis, fixed appliances, Methods of gaining spaces, Arch Expansion, extraction in routine orthodontic treatment, Treatment planning, Anchorage, Management of common malocclusion, Lab procedures, welding, soldering, study model, acrylization.

Practical:

- Brackets placement
- Model analysis
- Land marking of Cephalometric
- Fabrication of Arch expansion appliance
- Fabrication, Soldering and welding of molar tubes

Recommended Books:

- Orthodontics, The art and science by S.I bhalajhi
- Orthodontics at a glance by Daljit Gill, Blackwell

Objectives:

- To demonstrate cavity designs for inlays or onlays
- To describe different types of crowns and bridges
- To fabricate different types of crowns and bridges

Course Contents:

Crowns Terminology, Indications & Contra indications, Diagnosis & Treatment Planning, Basic Principles of preparation, Porcelain Jacket Crowns, Indications & Contraindications, Clinical assessment, and steps of preparation. Porcelain Fused to metal crowns Indications, Contraindications, Clinical assessment, Steps of preparation Full Crowns Indications, Contraindications, Elementary knowledge of cavity design for inlays (MOD, Class II, Class V) and onlays Principles of bridge design, Wax pattern of inlays, onlays, full veneer crown, jacket crown, Partial veneer crown, Resin bonded bridges, Types of crowns and bridges, Pontic designs, and Causes Of bridge failure, Porcelain fused to metal post and core crowns, full crowns.

Practical:

- Inlays (class II, M.O.D., and Class V).
- Onlay and lab preparation
- Bridge design (Cantilever, fixed). And lab preparation
- Inlays (Class I, Class V, ceramic inlays). And lab preparation
- Full veneer crown. And lab preparation
- Jacket crown.

Recommended Books:

Contemporary of fixed prosthodontics by 4th edition by Rossential. and. fujimoto

Prosthodontics at a Glance by Irfan Ahmad

Course objectives:

- To introduce the students with basic concepts in infection control.
- To introduce the students with infection control principles and practices.
- To introduce the students with importance of immunization and hand hygiene in infection control.
- To introduce the students with the role of clinical laboratory in infection control.

Course contents:

Introduction to infection control, principle of infection control, source and transmission of infection, infection in the hospital environment, immunization prophylaxes, exposure prophylaxes, sterilization, disinfection and antisepsis, practical disinfection, epidemiology of infectious disease, antimicrobial agents, antibiotic and their uses (prophylactic, empirical, and therapeutic), antibiotic resistance and policy, principles of laboratory diagnosis of infectious diseases, biomedical waste management, biosafety levels, hand hygiene, standard precautions and PPE.

Practical:

1. Demonstration of hand washing and hand rubbing technique.
2. Preparation of different disinfection and antiseptic solutions.
3. Demonstration of biomedical waste managements in hospitals.
4. Demonstration of cleaning and disinfection of working premises.
5. Demonstration of how to handle spills and aseptic handling.
6. Demonstration of standard precautions and PPE.

Recommended Books:

- Fundamentals of Infection Prevention and Control: Theory and Practice. [Weston](#), D., Wiley-Blackwell, 2013.
- Sherris Medical Microbiology: An Introduction to Infectious Diseases. Ryan, K. J., Ray, C. G., 4th ed. McGraw-Hill, 2003.
- District Laboratory Practice in Tropical Countries, Part1 & Part 2. [Cheesbrough](#), M., 2nd ed. Cambridge University Press, 2006.
- Medical Microbiology and Infection at a Glance. Gillespie, S., H., Bamford, K., B., 4th ed. Wiley-Blackwell, 2012.

Eight Semester

- 1. RESEARCHPROJECT**
- 2. SEMINAR**
- 3. BIOETHICS**
- 4. MAXILLOFACIAL PROSTHODONTICS**
- 5. MEDICAL EMERGENCIES IN DENTAL PRACTICE**

Objectives:

- Students will learn some basic research methodology and gain knowledge about research.
- It will hopefully result in some of presentation or publication for the students and will provide a research oriented environment

Course contents:

During last year each student should select a topic of research report with consultation of his/her supervisor and shall prepare and submit research report to Khyber Medical University by the end of last year.

Practical:

A hard copy of research project should submit to examination for degree requirements fulfillment.

During last year each student should select a topic of research work with consultation of his/her supervisor and shall present his/her research work through a seminar

Course Objectives:

- Use the approach of ethical principles the safety and benefits of the patients
- Analyze bioethical issues in practice

Course Contents:

Introduction of bioethics ,ethical principles ,autonomy ,informed consent, intentional non disclosure ,patient self determination act ,the health insurance portability and accountability act of 1996(HIPAA),privacy and security rules , non maleficence ,slippery slope arguments, beneficence, paternalism, justice, social justice , the patient protection and affordable care act, professional patient relationships ,unavoidable trust ,human dignity , patient advocacy ,moral suffering ,ethical dilemmas

Recommended Books:

- Introduction to bioethics and ethical decision making by Karen L. Rich (chapter 2).2015

DEN-622 Maxillofacial prosthodontics Credit Hours:3(2+1)

Course Objectives:

To introduce students with different maxillofacial prosthesis and their applications.

Course Contents:

Elementary knowledge of various maxillofacial prosthesis, Trauma, Orthognathic surgery, Classification Of obturators and its uses, Various types of jaw splints and their uses, Classification of gunning splints and Uses, various types of jaw exercises and uses, Various types of stunts and uses.

Practical:

- Clinical diagnosis of various maxillofacial and cranio facial defects
- Lab procedures involved in fabrication of splints, stunts and obturators.

Recommended Books:

- J Peterson, Tucker, Edward Ellis. Contemporary Oral & Maxillo facial surgery
- Oral and Maxillofacial Surgery by Kruger

Course Objectives:

- To enable the students to identify the medically compromised patient before the oral procedures
- To assist and help the complicated and complex cases
- Enable the students to manage the medically compromised patient

Course Contents:

Biographic Data , Chief Complaint History of Chief Complaint ,Medical History ,Review of Systems ,physical examination ,management of patients with compromising

medical conditions ,Cardiovascular Problems ,Ischemic Heart Disease ,Cerebrovascular Accident (Stroke), Dysrhythmias ,Heart Abnormalities that Predispose to Infective Endocarditis,,Congestive Heart Failure(Hypertrophic Cardiomyopathy), Pulmonary Problems

„Asthma „,Chronic Obstructive Pulmonary Disease ,Renal Problems „,Renal Failure

,Transplant and Transplant of Other Organs ,Hypertension ,Hepatic Disorders

Endocrine Disorders ,Diabetes Mellitus ,Adrenal Insufficiency

,Hyperthyroidism, Hypothyroidism

,Hematologic Problems ,Hereditary Coagulopathies ,Therapeutic

Anticoagulation , Neurologic Disorders, Seizure Disorders, Ethanolism

(Alcoholism) management of patients during and after pregnancy,

Pregnancy, Postpartum Period,

Practical:

History taking and evaluation of the patients in opds and wards

Recommended Books:

CONTEMPORARY ORAL AND MAXILLOFACIAL SURGERY,

SIXTH EDITION ., James R. Hupp, DMD, MD, JD, MBA , Edward Ellis III, DDS, MS, Myron

R. Tucker, DDS