Course Title	Microbiology and Immunology				
Course Code	DES202				
Course Type	Compulsory				
Level	Bachelor of Dentistry				
Year / Semester	2nd year / 3rd semester				
Teacher's Name	TBA				
ECTS	6	Lectures / week	3 hrs / 13 weeks + exam week	Laboratories / week	3hrs / X13 weeks
Course Purpose and Objectives	The Purpose and the objective of this course is to provide a basic knowledge of Medical Microbiology and Immunology, the way the Laboratory functions and Laboratory techniques. Basic teaching of pathogenic Bacteria, Viruses, Fungi and Parasites Knowledge of antimicrobials [antibacterials, antifungals, anti-parasitic and disinfectants] agents and their use in Dentistry Basic knowledge of Medical Immunology, basic components of the immune system, Immune function in health and disease, principles of vaccinations and mechanisms of protection from infection				
Learning Outcomes	Upon successful completion of this course students should be able to demonstrate the understanding of the following Microbiology and Immunology topics: • Describe the basic principles of Medical Microbiology and Familiarization with the various Microbes that make up the Resident Oral Microflora • Describe the different bacteria families and the way to identify them and understand the biological and clinical significance of the oral microbial flora in the form of a biofilm on dental and mucosal surfaces • Describe the basic mechanisms of Bacterial pathogenicity and understand the biological and clinical significance of the oral microbial flora in the form of a biofilm on dental and mucosal surfaces • Describe the various Antimicrobials, Antibacterials, Antifungals, Antivirals, Antiparasitic substances and Disinfectants, with emphasis to those used to treat/prevent infections in Dental Surgery • Describe the basics of viral, fungal and parasite pathogenicity and their treatment And the following Immunology topics: • Discuss the basic components of the immune system				

	• Understand its function in health and disease (immune deficiencies, immunity and infection, autoimmunity, hypersensitivity disease, tumor immunology, transplantation, immunotherapy) • Describe the various tests and techniques used to examine the immune system function and use in clinical diagnostics • Outline the principles of vaccinations and the mechanism of protection from infection		
Prerequisites	None	Co-requisites	None
Course Content	In this regard, students will familiarize themselves with the following chapters concerning the Course of Microbiology and Immunology: Microbiology • Introduction to Medical & Oral Microbiology; Introduction to Basic Immunology; Vaccines & Microbial Classification, Structure & Replication • Microbiology Laboratory Familiarization; Microscopy & In-Vitro Culture; Microbiology Laboratory Safety; The role of the Microbiology Laboratory • Routes of Transmission; Microbial Attachment, Colonization, Invasion & Elements of Host Protective Responses • Oral Ecosystem; Biofilms & Dental plaque [calculus] • Methods for Laboratory Diagnosis of Bacterial Disease, Molecular and Serologic Methods; General principles of Laboratory Diagnosis • Antimicrobial Agents; Choices & Prophylaxis in Dentistry & Sterilization, Disinfection & Antiseptics • Antimicrobial Susceptibility, Conventional Laboratory Techniques: Susceptibility: Plate, Dilution & Automated; Basic Identification Tests • Hospital Acquired Infections; Infection Control; Staphylococci & Streptococci & Enterococcus • Laboratory Diagnosis of Gram positive Cocci • Bacterial Metabolism, Genetics & Mutations; Enterobacteriaceae & Nonfermenting Gram Negative Rods • Laboratory Diagnosis of Gram negative Bacteria; Urinalysis; Identification of Gram negative & Gram positive Bacteria from Urine • Miscellaneous Gram –ve & Gram +ve Bacteria; Gram –ve Fastidious & Pleomorphic Bacteria & Mycoplasma, Chlamydia & Non-Sporing Anaerobes • Laboratory Diagnosis of Gastroenteritis, Gastritis, Foodborne Diseases & Other Bacteria • Foodborne & Waterborne Bacterial Infections & Intoxications; Bacterial Zoonoses; Prions; Acid Fast Bacteria & Filamentous Bacteria; Cat Scratch, Rat Bite Fever; Tick-borne Diseases • Laboratory Diagnosis of Mycobacteria, Filamentous & Zoonotic Bacteria		

	• Introduction to Virology, Classification, Structure & Replication; Viral Pathogenesis; Role of Viruses in Disease; Antiviral drugs • Papillomaviruses, Polyomaviruses, Adenoviruses & Human Herpes Viruses • Laboratory Diagnosis of Anaerobes & Oral Microbiology Lab Methods • Poxvirus, Parvovirus, Picornavirus; Coronavirus, Norovirus, Paramyxovirus & Orthomyxoviruses; Rhabdoviruses, Filoviruses, Bornaviruses, Reoviruses, Togaviruses, Flavivirus, Arboviruses, Bunyaviruses & Arenaviruses; Retro Viruses & Hepatitis Viruses • Laboratory Diagnosis of Viral Disease • Introduction to Medical Mycology & Phylogenetic Classification; Mycotoxins; Yeasts, Filamentous Fungi; Pathogenesis of Fungal Disease; Antifungal Agents • Superficial & Systemic Mycoses • Laboratory Diagnosis of Fungal Infections, Identification of Yeasts & Filamentous Fungi • Oral Ecosystem; Dental caries & Periodontal diseases Microbiology, Saliva and Gingival Crevicular Fluid, Orofacial Bacterial Infections, Oral Microflora & Systemic diseases in the immunocompromised host; Oral Fungal & Orofacial Viral Infections • Antiparasitic Drugs; Parasitic Classification, Intestinal & Urogenital Protozoa; Nematodes, Trematodes, Cestodes; Arthropods, Blood, Tissue Protozoa & • Laboratory Diagnosis of Parasites, Macroscopy & Microscopy; Endo & Ecto-Parasites- Protozoa, Worms & Mites Immunology • The description of cells and organs of the immune system • The innate immune system including humoral mechanisms: cytokines & complement • An overview of the adaptive immune system including antigen processing & presentation • The activation and regulation of innate and adaptive immunity including cellular mechanisms & receptors • Cell co-operation and effectors' mechanisms including immune evasion and principles governing vaccination • Antibody structure and interaction with antigens • The molecular basis of antigen specificity • Self/non-self-discrimination and disorders of the immune system • Immunization principles and defense against infectious diseases • Tumor & Transplantation immunology • Inflammation, Allergies & Autoimmunity • Immune deficiencies • The use of immunological techniques for testing for the diagnosis and laboratory monitoring of disease in the clinical laboratory

<table>
<tr><td>Teaching Methodology</td><td>Face-to-face. Lectures, Laboratories, Clinical Cases, quizzes, etc</td></tr>
<tr><td>Bibliography</td><td>1. Ken S Rosenthal, Michael A Pfaller and Patrick R Murray Medical Microbiology: 8th Edition; With Student Consult online Access, 2016

2. Medical Microbiology and Infection at a Glance- 4th Edition; Gillespie S & Bamford K.

Additional Reading
3. March PD & Martin MV. Oral Microbiology 5th Edition 2009

4. Abul K. Abbas MBBS, Andrew H. H. Lichtman MD PhD. Basic Immunology Updated Edition: Functions and Disorders of the Immune System with STUDENT CONSULT Online Access, Saunders; 4th Edition (February 12, 2010). ISBN-10: 141605569X, ISBN-13: 978-1416055693.

5. Abul K. Abbas, Andrew H. Lichtman & Shiv Pillai. Basic Immunology: Functions and Disorders of the Immune System; 6th Edition Elsevier</td></tr>
<tr><td>Assessment</td><td><table>
<tr><td>Final Exams</td><td>60%</td></tr>
<tr><td>Lab report / oral presentation</td><td>30%</td></tr>
<tr><td>Participation and attendance</td><td>10%</td></tr>
<tr><td></td><td>100%</td></tr>
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<tr><td>Language</td><td>English</td></tr>
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