

**BACHELOR OF SCIENCE (GENERAL)  
2<sup>nd</sup> SEMESTER**

**DISCIPLINE SPECIFIC COURSE (CORE)**

**CLB220C: CLINICAL BIOCHEMISTRY: CLINICAL IMMUNOLOGY AND MICROBIOLOGY**

**CREDITS: THEORY – 4, PRACTICAL – 2**

**THEORY (4 CREDITS: 60 HOURS)**

**MAXIMUM MARKS: 60, MINIMUM MARKS: 24**

***Objectives and Expected Learning Outcomes:***

*To impart students with basic aspects of microbiology, host-pathogen interaction, cellular components of the immune system and the disorders associated with cellular immune system. Practical course will impart hands-on skills in basic techniques of cell culture and immunology and their utility in laboratory diagnosis of human diseases.*

**UNIT-1 (15 Hours)**

Microbiology: Introduction and importance of microbiology in human health, Microbial growth and growth curve. Measurement and factors affecting microbial growth. Classification of microorganisms, criteria for classification; Normal human micro-flora. Virulence and pathogenesis. Toxin: Type and their mode of action

**UNIT- 2 (15 Hours)**

Host pathogen interaction: Definitions - Infection, Invasion, Pathogen, Pathogenicity, Virulence, Toxigenicity; Antimicrobial agents and Antibiotics: Introduction, mechanism of action, classification and uses, Antibiotic susceptibility testing; Morphology, pathogenicity, clinical features and diagnosis of Staphylococcus, Streptococcus and *Pneumococcus*

**UNIT- 3 (15 Hours)**

An introduction to immune system, Innate and adaptive immunity, Cells and organs of the immune system, Primary and secondary immune responses, Antigens and haptens – Properties, heterogeneity, B and T cell epitopes; Antibodies – Structure, function and properties, classification; Antigen-antibody interactions, Introduction to hybridoma technology

**UNIT- 4 (15 Hours)**

Mechanism of humoral and cell mediated immune response. Introduction of Major Histocompatibility Complex and its organization, Antigen presenting cells, antigen processing and presentation, Complement system and complement fixation test. Immunological disorders: primary and secondary immunodeficiency, SCID and AIDS

**PRACTICAL (2 CREDITS: 60 Hours)    MAXIMUM MARKS: 30, MINIMUM MARKS: 12**

- 1) Sterilization and preparation of liquid and solid media for growth of microorganisms.
- 2) Isolation and maintenance of organisms by plating, streaking, Slants and slab cultures.
- 3) Demonstration of Incubator and preservation of cultures
- 4) Isolation of pure cultures
- 5) Preparation of culture plates
- 6) Gram staining and acid fast staining
- 7) Demonstration of ELISA