

BTPC3003 IMMUNO-BIOLOGY AND IMMUNOTECHNOLOGY [3-0-0]

Module I: (08 Hours)

Introduction, Phylogeny of Immune system, Innate and acquired Immunity, Clonal nature of Immune response. Hematopoiesis: Origin and differentiation of Lymphocytes and phagocytic cells- receptors and signals that control lymphocyte lineage commitment, Organization and Structure of Lymphoid Organs.

Module II: (10 Hours)

Innate and acquired immunity. Elements of Immunity – B lymphocytes and thymus derived (T) Lymphocytes. Activation and regulation of B and T lymphocytes. Nature and Biology of antigens and super antigens. complement system.

Module III: (08 Hours)

Immunoglobulins - Classes and subclasses, organization and expression of immunoglobulin genes. Immunoglobulin gene rearrangement –antibody diversity TCR, Antigen presenting cells- antigen processing and presentation, Cytokine and their role in immune regulations.

Module IV: (08 Hours)

Cell-mediated cytotoxicity, Mechanism of T cell and NK cell mediated lysis, Antibody dependent cell mediated cytotoxicity, Hypersensitivity reactions, Immunological tolerance. Introduction and cause of Autoimmunity. Immunity to infectious agents Tumors: Immune response to tumors-types of tumor antigens.

Module V: (06 Hours)

Vaccine technology: Rationale of vaccine designing based on clinical requirements, vaccine types, Hybridoma technology, ELISA, ELISpot, Immunofluorescence, Flow Cytometry, immunohistochemistry.

Books:

1. Goldsby. R.A, Kindt.T.J, Kuby J and Osborne BA, Immunology, 7th Eds. W.H.Freeman Pubn. New York 2014.
2. Abbas K A, Litchman A. H. Cellular and Molecular Immunology. 8th Eds., W. B. Saunders Co. 2015
3. Judy Owen , Jenni Punt , Sharon Stranford , Patricia Jones Kuby, immunology 88th Eds.W.H. Freeman Pubn 2018.
4. C. A. JanewayJr, P. Travers. Immunobiology, 8th Ed, Lecture spring Pub. 2014.
5. Roitt I.M., Brostoff. J, Male. D.K. Immunology, 7th B. K. &Creds, Garland Pub Ltd. 2014.

Course outcomes (Cos)-

- CO1: Understand the Components of the Immune System: Explain the structure and function of immune cells, organs, and molecules involved in innate and adaptive immunity.
- CO2: Differentiate Immune Mechanisms: Distinguish between various immune responses, such as humoral and cell-mediated immunity, and their roles in health and disease.
- CO3: Apply Immunological Techniques: Demonstrate knowledge and practical skills in immunological methods like ELISA, flow cytometry, Western blotting, and immunofluorescence.
- CO4: Analyze Immunological Disorders and Vaccines: Understand the basis of autoimmune diseases, hypersensitivities, immunodeficiencies, and the principles of vaccine development and immunotherapy.
- CO5: Integrate Immunotechnology in Diagnostics and Therapeutics: Apply immunological tools and biotechnological innovations in clinical diagnostics, therapeutic development, and biomedical research.