

Unit-I**(13 h)**

Microbes-Host interaction, cell organization, signal transduction. Infection: Definition, Types, portal of entry, role of enzymes, proteins and toxins during invasions, stages of infection. Bacterial toxins: Types, superantigens, pore-forming toxins, soluble toxins, toxins acting on signal transduction, membrane perturbation and permeabilization. Important human pathogens: *Mycobacterium tuberculosis*, *Klebsiella pneumoniae*, *Proteus vulgaris*, *Shigella dysenteriae*, *Vibrio cholerae*. Emerging and re-emerging pathogens. Rapid diagnostic principles, Nucleic acid probes, Real Time PCR, Methods in molecular typing, Microarray technology.

Unit-II**(13 h)**

Antibiotics, Mechanisms of antibiotic resistance, extended spectrum β - lactamases. Inhibitors of enzymes, novel antibiotics from natural resource, strategic mechanism and interference between host cell and pathogen interaction and control of pathogenesis. Mechanisms of antimicrobial therapeutic molecules AMPS, Newer vaccines: Recombinant vaccines, subunit vaccines, DNA vaccines, BCG & HIV- vector based vaccines.

Unit-III**(13 h)**

Immunity, Innate(non-specific) and Adaptive(specific) immunity, primary and secondary lymphoid organs, Cells of the immune system- macrophages, B-cells, T-cells, NK Cells, Basophils, mast cells, hematopoiesis, Humoral or antibody mediated immune response and Cell mediated immune response, receptors of the B-cells, T-cells, monoclonal and polyclonal antibodies, Immunogenicity, antigenicity, factors that influence immunogenicity, primary and secondary immune response, Immunoglobulin classes, Immunoglobulin superfamily, secretion of immunoglobulins.

Unit-IV**(13 h)**

Hypersensitivity, types I, II, III DTH, Immunodeficiencies, Acquired immunodeficiency syndrome, SCID, X-linked gammaglobulinemia, Opportunistic infections Cancer induction, Tumors of the Immune System, Tumor Antigens, viral induced antigens, Immune Response to Tumors, Evasion of the Immune System, Immunosurveillance, Organ-Specific Autoimmune Diseases, Systemic Autoimmune Diseases, Hashimoto's thyroiditis, autoimmune anemia, Insulin-dependent diabetes mellitus, Goodpasture's syndrome, Graves' disease, myasthenia gravis, Systemic Lupus Erythematosus, Rheumatoid arthritis, multiple sclerosis.