Course Code: ZOO 413: **Course Title: Immunology**
Number of Credits: 2
Effective from AY: 2020 -21

Prerequisite for the Course:	Basic knowledge on cell biology	
Objectives:	1. To enable the student to understand the principles and mechanisms of immunology 2. To update the student on the scope and importance of clinical immunology and create an awareness about the inherent dangers of microbes 3. To impart conceptual understanding of functional organization of immune system and its responsiveness in health and disease	
Content	**Module 1:** An overview: Scope of immunology, recognition of self and non-self as a basic functional feature of immune system; Concepts of external and internal defense systems;Types of immunity: innate and acquired- types, functional features; concept of adaptive immunity; Immune tissues / organs-- types, anatomical location, structure and development; lymphocyte traffic during development. **Antigens and Immunogenicity:** Definition, characteristic features and classification; Adjuvants: definition, types and applications. **Cellular Immune System:** Lymphocytes: types, morphology, clones / sub-populations, distribution, B and T cell receptors, B and T cell epitopes, Toll-like receptors; Antigen presenting cells: antigen processing and presentation, MHC molecules and their immunologic significance **Module 2:** **Antibodies:** Primary structure, classification, variants and antigen-antibody interactions; Structural and functional characteristics of various antibody classes; Generation of diversity; Monoclonal antibodies: definition, production and applications; Antibody engineering and its applications. **Complement system:** Components, three major activation pathways, and immune functions including anaphylaxis and inflammation. **Cytokines and Interferons:** Definition and salient functional features; Interleukins: definition, types (lymphokines and monokines), and functions; Interferons--Origin, types and functions	12 hrs 12 hrs
Pedagogy:	Lectures/ tutorials/self-study	

Learning Outcome:	1. Development of knowledge on the cellular ontogeny and organ involvement in immunity and how the immune system can fight infections and diseases. 2. Knowledge on development of body immune mechanisms and their applications. 3. Understanding of current immunology news and issues
References /Reading	1. Kuby Immunology, 6th edition (2007), T. J. Kindt, R.A. Goldbye, B.A. Osborne, Publisher: W.H. Freeman and Company. 2. Immunobiology: The Immune System in Health and Diseases, 6th Edition (2005), Charles A. Janeway, Publisher: Garland Science. 3. Roitt's Essential Immunology, 11th Edition (2006) Peter Delves, Seamus Martin, Dennis Burton, Ivan Roitt, Publisher: Wiley-Blackwell. 4. Cellular and Molecular Immunology, 6th Edition (2008) Abul K. Abbas, Andrew H. Lichtman, and Shiv Pillai, Publisher: Elsevier, USA. 5. Prescott, Harley, Klein's Microbiology 7th edition (2009), Joanne M Willey, Christopher J Woolverton, Linda M Sherwood, Publisher: McGraw-Hill.