

Course: Discipline Specific Core

Semester	5
Paper Number	HMBCR5122T/P
Paper Title	Immunology
No. of Credits	6 (Th:4, Pr:2)
Theory/Composite	Composite
No. of periods assigned	Th: 4 Pr: 3
Course description/objective	<ol style="list-style-type: none">1. To understand the immune system, mechanism of action of immune cells2. To understand the mechanism of hypersensitivity, autoimmunity etc
Reading/Reference Lists	<ol style="list-style-type: none">1. Abbas AK, Lichtman AH, Pillai S. (2007). Cellular and Molecular Immunology. 6th edition Saunders Publication, Philadelphia.2. Delves P, Martin S, Burton D, Roitt IM. (2006). Roitt's Essential Immunology. 11th edition WileyBlackwell Scientific Publication, Oxford.3. Goldsby RA, Kindt TJ, Osborne BA. (2007). Kuby's Immunology. 6th edition W.H. Freeman and Company, New York.4. Murphy K, Travers P, Walport M. (2008). Janeway's Immunobiology. 7th edition Garland Science Publishers, New York.5. Peakman M, and Vergani D. (2009). Basic and Clinical Immunology. 2nd edition Churchill Livingstone Publishers, Edinberg.6. Richard C and Geiffrey S. (2009). Immunology. 6th edition. Wiley Blackwell Publication.
Evaluation	CIA: 20 End-Sem: 80 (Th:50 and Pr:30) Question paper format of Th paper (Mod 1 & 2: 25 Marks each) For each module: Objective questions 5 marks (5 questions out of 7) 2 questions of 10 marks each (2 questions out of 3)

C-12: IMMUNOLOGY (THEORY)
SEMESTER –V

HMBCR5122T

TOTAL HOURS: 52

CREDITS: 4

Module 1

Marks 25

Unit 1 Introduction

No. of Hours: 2

Concept of Innate and Adaptive immunity, cell mediated and humoral immunity

Unit 2 Immune Cells and Organs

No. of Hours: 4

Structure, Functions and Properties of: Immune Cells – Stem cell, T cell, B cell, NK cell, Macrophage, Neutrophil, Eosinophil, Basophil, Mast cell, Dendritic cell; and Immune Organs – Bone

Marrow, Thymus, Lymph Node, Spleen, GALT, MALT, CALT

Unit 3 Antigens

No. of Hours: 6

Characteristics of an antigen (Foreignness, Molecular size and Heterogeneity); Haptens; Epitopes (T

& B cell epitopes); T-dependent and T-independent antigens; Adjuvants

Unit 4 Major Histocompatibility Complex

No. of Hours: 6

Organization of MHC locus (Mice & Human); Structure and Functions of MHC I & II molecules;

Antigen processing and presentation (Cytosolic and Endocytic pathways)

Unit 5 Generation of Immune Response

No. of Hours: 8

Primary and Secondary Immune Response; Generation of Humoral Immune Response (Plasma and

Memory cells); Generation of Cell Mediated Immune Response (Self MHC restriction, T cell activation, Co- stimulatory signals); Killing Mechanisms by CTL and NK cells, Introduction to tolerance

Module 2

Marks 25

Unit 6 Antibodies

No. of Hours: 6

Structure, Types, Functions and Properties of antibodies; Antigenic determinants on antibodies (Isotypic, allotypic, idiotypic); VDJ rearrangements; Monoclonal and Chimeric antibodies

Unit 7 Complement System

No. of Hours: 4

Components of the Complement system; Activation pathways (Classical, Alternative and Lectin pathways); Biological consequences of complement Activation

Unit 8 Immunological Disorders and Tumor Immunity**No. of Hours: 8**

Types of Autoimmunity and Hypersensitivity with examples; Immunodeficiencies - Animal models

(Nude and SCID mice), SCID, DiGeorge syndrome, Chediak- Higashi syndrome, Leukocyte adhesion

deficiency, CGD; Types of tumors, tumor Antigens, causes and therapy for cancers, vaccination

Unit 9 Immunological Techniques**No. of Hours: 8**

Principles of Precipitation, Agglutination, Immunodiffusion, Immunoelectrophoresis, ELISA,

ELISPOT, Western blotting, Immunofluorescence, Flow cytometry, Immunoelectron microscopy.

C-12: IMMUNOLOGY**(PRACTICAL)****HMBCR5122P****TOTAL HOURS:39****CREDITS: 2**

1. Identification of human blood groups.
2. Separate serum from the blood sample (demonstration).
3. Perform immunodiffusion by Ouchterlony method.
4. Perform sandwich ELISA.
5. Perform immunoelectrophoresis.
- 6 Separation of IgG by column chromatography

