

**Paper No- 11**  
**SEMESTER - V**  
**IMMUNOLOGY**

**THEORY**

**MARKS: 100**

**Unit 1 Introduction**

**No. of lectures: 3**

- 1.1 Concept of Innate and Adaptive immunity
- 1.2 Immune dysfunction and its consequences

*(Chapter 1, Kuby's Immunology, by Goldsby RA, Kindt TJ, Osborne BA.6th Ed., W.H. Freeman and Company, New York, 2007, Pages: 8-12; 18-19)*

**Unit 2 Immune Cells and Organs**

**No. of lectures: 10**

- 2.1 Structure, Functions and Properties of Immune Cells -T cell, B cell, NK cell, Macrophage, Neutrophil, Eosinophil, Basophil, Dendritic cell
- 2.2 Structure and Functions of Immune Organs – Bone Marrow, Thymus, Lymph Node, Spleen, GALT

*(Chapter 2, Kuby's Immunology by Goldsby RA, Kindt TJ, Osborne BA.6th Ed., W.H. Freeman and Company, New York. 2007, Pages: 30-40; 40-47)*

**Unit 3 Antigens**

**No. of lectures: 7**

- 3.1 Antigenicity *versus* Immunogenicity
- 3.2 Haptens
- 3.3 Characteristics of an antigen - Foreignness, Molecular size and Heterogeneity
- 3.4 T-dependent and T-independent antigens
- 3.5 Adjuvants

*(Chapters 4 & 11, Kuby's Immunology by Goldsby RA, Kindt TJ, Osborne BA.6th Ed., W.H. Freeman and Company, New York. 2007, Pages: 76- 81;278-279)*

**Unit 4 Antibodies and Humoral Immune Response**

**No. of lectures: 12**

- 4.1 Basic structure of antibody- CDRs, Framework region, Hinge
- 4.2 Primary and secondary immune response
- 4.3 Antibody mediated effector function
- 4.4 Types and properties of antibodies
- 4.5 Monoclonal antibodies – preparation and applications
- 4.6 Antigen-antibody interaction– Precipitation, Agglutination, Immunoelectrophoresis, Immunofluorescence, ELISA

*(Chapters 4,6 & 11, Kuby's Immunology by Goldsby RA, Kindt TJ, Osborne BA.6th Ed., W.H. Freeman and Company, New York. 2007, Pages: 84-85, 90, 93;94-95;95-100; 105-106;151-154; 289-290)*

**Unit 5 Major Histocompatibility Complex and Cell Mediated Immunity**

**No. of lectures: 10**

- 5.1 Organization and inheritance of MHC locus in humans
- 5.2 Structure and functions of MHC I & II molecules
- 5.3 Cellular expression of MHC molecules
- 5.4 Antigen processing and presentation - Cytosolic and Endocytic pathways
- 5.5 Killing mechanisms by CTL, NK cells and ADCC

*(Chapters 8 & 14, Kuby's Immunology by Goldsby RA, Kindt TJ, Osborne BA.6th Ed., W.H. Freeman and Company, New York. 2007, Pages:190-193; 193-195;203-204; 210-216; 351-360)*

## Unit 6 Complement System

No. of lectures: 6

- 6.1 Components of the complement system
- 6.2 Activation pathways - Classical, Alternative and Lectin pathway
- 6.3 Biological consequences of complement activation

(Chapter 7, *Kuby's Immunology.*, Goldsby RA, Kindt TJ, Osborne BA.6th Ed., W.H. Freeman and Company, New York. Year 2007, Pages:169; 170-176; 180-185)

## PRACTICALS

MARKS: 50

1. Identification of human blood groups
2. To perform Total Leukocyte Count (TLC) of the given blood sample
3. To perform Differential Leukocyte Count (DLC) of the given blood sample
4. To perform immunodiffusion by Ouchterlony method
5. To demonstrate single radial immunodiffusion (SRID) technique
6. To demonstrate immunoelectrophoresis

## SUGGESTED READINGS

1. Delves P, Martin S, Burton D, Roitt IM. (2006). *Roitt's Essential Immunology*. 11<sup>th</sup> edition Wiley-Blackwell Scientific Publication, Oxford
2. Goldsby RA, Kindt TJ, Osborne BA. (2007). *Kuby's Immunology*. 6<sup>th</sup> edition W.H. Freeman and Company, New York
3. Murphy K, Travers P, Walport M. (2008). *Janeway's Immunobiology*. 7<sup>th</sup> edition Garland Science Publishers, New York

## ONLINE READING MATERIAL

1. <http://books.google.co.in/books/immunology/elgert>
2. <http://books.google.co.in/books/immunology/coico>