INSTITUTE	**FACULTY OF SCIENCE**
PROGRAM	**BACHELOR OF SCIENCE (MICROBIOLOGY)**
SEMESTER	**6**
COURSE TITLE	**BASICS OF IMMUNOLOGY**
COURSE CODE	**02MB0357**
COURSE CREDITS	**4**

Objective:

1 To provide a fundamental insight of the inner workings of Immune System and its implications on human health.

Course Outcomes: After completion of this course, student will be able to:

1 Make use of the knowledge of immune system functions to differentiate between innate and adaptive immunity in various physiological and pathological conditions.

2 Correlate the development, activation, and functions of different immune cells and organs, evaluating their roles in immune responses.

3 Implement experimental immunological techniques for disease diagnosis and interpretation of immune responses.

4 Analyze the impact of immune system malfunctions in disease conditions, assessing their underlying mechanisms and clinical implications.

Pre-requisite of course: Fundamental knowledge of Cell Biology and Biomolecules.

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
4	0	0	50	30	20	0	0

Contents : Unit	Topics	Contact Hours
1	**Overview of Immune System** History of immunology; Functional role of Immune System; Types of Immunity: Innate and adaptive immunity; Physical barriers to infection; Cells and organs of the innate and adaptive immune system; Haematopoiesis.	15

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Contents : Unit	Topics	Contact Hours
2	**Antigen and Antibody: Types, Roles, Interactions and Applications Antigen** Characteristics of antigens; Factors that influence immunogenicity; Cross reactivity; Epitopes; Haptens, Adjuvants. Immunoglobulins: Structure, Classification & Functions; Organization & Synthesis of Light chain genes & Heavy chain genes, Class & Isotype Switching. Monoclonal Antibodies: Production by Hybridoma Technology & Applications. Antigen and Antibody Interactions- Agglutination, Precipitation, ELISA, RIA, Immunoflorescence & Western Blotting).	15
3	**Development, Activation and Communication in Adaptive Immunity** MHC molecules and organisation of their genes; Structure and function of MHC gene products; Antigen Processing and Presentations. T- Cell Receptor; T- Cell Maturation, Activation, Differentiation; B- Cell Maturation, Activation, Differentiation. Cytokines: Properties of Cytokines; Cytokine receptors; Function of Cytokines. Complement System: Function; Component; Activation and Regulation. Cell Mediated Effector Responses	15
4	**Immunology in Health and Diseases** Immune response to Infectious Diseases: Viral (Influenza); Bacterial (Tuberculosis); Protozoan (Malaria); Immunodeficiency Diseases: Primary (SCID) & Secondary (AIDS). Autoimmune Diseases: Organ Specific (Graves disease; Insulin dependent diabeties mallitus) and Systemic Autoimmune Diseases (Rheumatoid Arthritis; Multiple sclerosis). Transplantation Immunology: Graft rejection; Evidence & Mechanism of Graft rejection; Prevention of Graft rejection, Immunosuppressive Drugs; Hypersensitive Reactions. Inflammatory response; Vaccines and there types.	15
Total Hours		**60**

Textbook :

1 Immunology , B. M. Hannigan, C. B. T. Moore and D. G. Quinn , Viva Books, 2010

2 Immunology, K. D. Elgert , Wiley Blackwell, 2009

References:

1 Immunology, Immunology, D. Male, J. Brostoff, D. B. Roth & I. Roitt , Elsevier, 2006

2 Microbial inhabitants of humans, Microbial inhabitants of humans, M. Wilson , Cambridge, 2005

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

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Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking / Creative**
5.00	10.00	30.00	30.00	20.00	5.00

Instructional Method:

1. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by white board may also use any of tools such as demonstration, role play, Quiz, brainstorming, etc.
2. The internal evaluation will be done based on continuous evaluation of students in the classroom in the form of attendance, assignments, presentations, verbal interactions etc.
3. Students will use supplementary resources such as online videos, ebooks, ppts etc.

Supplementary Resources:

1. https://www.youtube.com/watch?v=LuLclqb5Iak

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