Department of Liberal Education
Era University, Lucknow
Course Outline
Effective From: 2023-24

Name of the Program	**B.A. / B.Sc. (LIBERAL EDUCATION)**			**Year/ Semester:**	**2nd / 3rd**
Course Name	**Immunology**	**Course Code:**	**MB201**	**Type:**	**Theory**
Credits	**04**			**Total Sessions Hours:**	**60 Hours**
Evaluation Spread	**Internal Continuous Assesment:**	**40 Marks**		**End Term Exam:**	**35 Marks**
Type of Course	○ Compulsory	◉ Core		○ Creative	○ Life Skill
Course Objectives	This module will help students to understand following; a. History of Immunology b. Organs & Cells of immune system c. Immunity d. Characteristics & types of antigens e. Immunogens f. Immunoglobulin; Structure & function g. MHC I & MHC II h. Hypersensitivity i. Applications of antibody j. Antigen-Antibody reactions				

Course Outcomes (CO): *After the successful course completion, learners will develop following attributes:*

Course Outcome (CO)	Attributes
CO1	Learners will be able to learn the historical development of immunology along with organs & cells of immune system.
CO2	Students will be able to differentiate among the Immunity, Antigen & Immunogens.
CO3	Students will learn the structure and function of Immunoglobulins, MHC classes and hypersensitivity responses.
CO4	They will describe the applications of antibody in diagnosis & therapy with antigen-antibody reactions.
Pedagogy	Interactive, discussion-bases, student-centered, presentation.
Internal Evaluation Mode	Mid-term Examination: 20 Marks Class test: 05 Marks Online Test/Objective Test: 05 Marks Assignments/Presentation: 05 Marks Attendance: 05 Marks

Session Details	Topic	Hours	Mapped CO
Unit 1	**Overview of Immunology** • History of immunology • Physical and physiological barriers	15	CO1

	• Innate and Acquired immunity • Organs and Cells of Immune system. • Complement System-Complement System Proteins • Complement System Activation by Classical • Alternate and Lectin Pathway		
Unit 2	**Immunity, Antigen & Immunogens** • Humoral and Cell Mediated Immunity • Active And Passive Immunity • Antigen Characteristics • Types of Antigens • Adjuvants • Immunogenicity and Antigenicity • Cytokines	15	CO2
Unit 3	**Immunoglobulins and MHC and their role, Hypersensitivity** • Classes of immunoglobulin • structure and function • Major Histocompatibility Complex: Types, Antigen Presentation through MHC class I molecules & MHC class II molecules • Types of Hypersensitivity • Mechanism of hypersensitivities with examples	15	CO3
Unit 4	**Immune Response &Applications of Immunoglobulins** • Antibody dependent Cell mediated Cytotoxicity • Phagocytosis • Inflammation and Inflammatory response mechanism • Applications of antibody in diagnosis and therapy • *In vitro* serological test methods: Antigen-Antibody Reactions: Agglutination and immuno diffusion • ELISA and RIA	15	CO4

CO-PO and PSO Mapping

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1			1			2			1	1			1	
CO2			1							1			1	
CO3			2	1	1	1	3		2	2			2	1
CO4			2	2	3	1	2		3	2	2		2	2

Strongcontribution-3,Averagecontribution-2, Lowcontribution-1,

Suggested Readings:

Text- Books	1. Kindt, Goldsby and Osborne. Kuby's Immunology. WH Freeman& Company
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Para Text	**Unit 1:** 1. **https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3576926/** **Unit 2:** **2. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1170312/pdf/007105.pdf**

	Unit 3: **3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2291482/pdf/pgen.1000024.pdf** **Unit4:** **4. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3253344/pdf/nihms-312011.pdf**

Recapitulation & Examination Pattern

Internal Continuous Assessment:

Component	**Marks**	**Pattern**
Mid Semester	20	**Section A:** Contains **10** MCQs/Fill in the blanks/One Word Answer/ True-False type of questions. Each question carries **0.5 mark.** **Section B:** Contains **07** descriptive questions out of which **05** questions are to be attempted. Each question carries **03 marks**.
Class Test	05	Contains **05 descriptive questions.** Each question carries **01** mark.
Online Test/ Objective Test	05	Contains **10 multiple choice questions.** Each question carries **0.5** mark.
Assignment/ Presentation	05	Assignmet to be made on topics and instruction given by subject teacher
Attendance	05	As per policy
Total Marks	**40**	

Course created by: Dr.Manaal Zahera **Signature:**	**Approved by: Dr. Amita Jain** **Signature:**