SEMESTER S6

IMMUNOLOGY

Course Code	PEBBT631	CIE Marks	40
Teaching Hours/Week (L: T:P: R)	3:0:0:0	ESE Marks	60
Credits	3	Exam Hours	2 Hrs. 30 Min.
Prerequisites (if any)	NONE	Course Type	Theory

Course Objectives:

1. Acquire knowledge on types of immunity, cells, and organs of the immune system
2. Provide knowledge on essential features of antigen-antibody and their interactions
3. Explain the concept of hypersensitivity, autoimmunity, and transplantation.
4. Provide knowledge of immunological techniques.

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SYLLABUS

Module No.	Syllabus Description	Contact Hours
1	**Introduction**: Scope of Immunology, Historical background of Immunology Haematopoiesis, Innate and Adaptive Immunity, Cells and organs of the Immune System. Forms of immune activity (immune response, immune non-reactivity)	9
2	**Antigens:** Essential features of Ag, haptens, Carrier molecule, Antigenic determinants. Adjuvants: Freund's complete and incomplete. **Antibodies**: Nature, Primary structure of immunoglobulins, Classification of Immunoglobulins: Types –IgG gM, IgA, IgD and IgE, Immunological memory, Immune tolerance **MHC**: Types, structure, function, **Complement Pathways**-Types and functions	9

3	**Hypersensitivity (HS)**: **Type I**: Allergies and anaphylaxis **Type II:** Haemolytic disease of new born (HDN). **Type III**. Soluble immune complexes and insoluble immune complex-mediated reactions. **Type IV**: Delayed type (or) cell-mediated HS reactions; Tuberculin reaction. **Autoimmunity**: Introduction, Auto recognition, classes of autoimmune diseases. (Hashimoto disease, thyrotoxicosis, Systemic lupus erythematosus, Rheumatoid arthritis **Transplantation:** Terminology, Auto graft, Isograft, Allograft, Xenograft, Immunological basis of transplantation reactions (Role of T & B cells) **Immune suppression**, drugs (azathioprine, methotrexate, cyclophosphamide, cyclosporin-A, Steroids)	**9**
4	**Immune response to infection;** immune response to bacteria and viruses **Immunotechnology**: Antigen-antibody interaction (Precipitation and agglutination reaction), Immunoelectrophoretic, RIA, western blot, ELISA, immunohistochemistry – Introduction and Basics	**9**

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Course Assessment Method
(CIE: 40 marks, ESE: 60 marks)

Continuous Internal Evaluation Marks (CIE):

Attendance	Assignment/ Microproject	Internal Examination-1 (Written)	Internal Examination- 2 (Written)	Total
5	**15**	**10**	**10**	**40**

End Semester Examination Marks (ESE)

In Part A, all questions need to be answered and in Part B, each student can choose any one full question out of two questions

Part A	Part B	Total
• 2 Questions from each module. • Total of 8 Questions, each carrying 3 marks **(8x3 =24marks)**	• Each question carries 9 marks. • Two questions will be given from each module, out of which 1 question should be answered. • Each question can have a maximum of 3 subdivisions. **(4x9 = 36 marks)**	**60**

Course Outcomes (COs)

At the end of the course, students should be able to:

	Course Outcome	Bloom's Knowledge Level (KL)
CO1	Elaborate on various types of immunity and components of the immune system	**K2**
CO2	Interpret the role of the immune system in hypersensitivity, autoimmunity, and transplantation	**K3**
CO3	Illustrate the basis of immunological tolerance and how the complex network of immune functions contributes to host defense.	**K2**
CO4	Apply the concepts of immune technology in diagnosis and treatment	**K3**

Note*: K1- Remember, K2- Understand, K3- Apply, K4- Analyse, K5- Evaluate, K6- Create*

CO-PO Mapping Table:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2										2
CO2	3	2										2
CO3	3	2					2					2
CO4	3	2										2

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Text Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Immunology	Janis Kuby, Thomas J. Kindt, et al	W H Freeman	8th edition 2006
2	Roitt's Essential Immunology	Seamus J. MartinDennis R. Burton Ivan M. Roitt Peter J. Delves	Wiley	13th edition 2017
3	Text Book of Immunology	Basir F	Eastern Economy	2nd edition 2012

Reference Books				
Sl. No	**Title of the Book**	**Name of the Author/s**	**Name of the Publisher**	**Edition and Year**
1	Immunology: A Short Course	Geoffrey Sunshine, Richard Coico	Wiley	7th edition, 2015
2	Microbiology An Introduction	Tortora, Funk and Case	Pearson	13th edition, 2021
3	Textbook Of Immunology Including Immunotechnology & Immunotherapy	Ajoy Paul	Books and Allied	1st edition 2018

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Video Links (NPTEL, SWAYAM…)	
Module No.	**Link ID**
1, 2, 3 & 4	NPTEL :: Http://digimat.in/nptel/courses/video/102105083/L57.html https://onlinecourses.nptel.ac.in/noc24_bt24/preview NPTEL :: http://digimat.in/nptel/courses/video/102105083/L51.html https://onlinecourses.nptel.ac.in/noc24_bt24/preview

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