

IMMUNOLOGY

Sem	Sub. Code	Category	Lecture		Theory		Practical		Credit
			Hrs/ week	Hrs/ sem.	Hrs/ week	Hrs/ sem.	Hrs/ week	Hrs/ sem.	
VI	21CBC6D	Elective	3	45	3	45	-	-	3

COURSE OBJECTIVE:

- An understanding of role of immune system in maintaining health and contributing to disease.
- An understanding of cellular and molecular basis of immune responsiveness.
- An understanding of the characteristics of antigens and antibodies and application of antigen-antibody reactions

COURSE OUTCOMES:

On the successful completion of the course, students will be able to -

CO Number	CO Statement	Knowledge Level (K ₁ – K ₄)
CO1	To know about the Cells and Organs of the Immune system and the role of complement system.	K1
CO2	To understand the types of immunity, Immunological response and interaction between the immune cells	K2
CO3	To gain the knowledge about Immunization methods and also about the principle, application of various Immune Techniques	K2
CO4	To understand the concept of theories of Antibody formation and mechanisms contributing to Antibody diversity and MHC complex	K3
CO5	To gain knowledge about the cause, symptoms and treatment of Hypersensitivity, Immunodeficiency diseases and auto immune diseases.	K4

(*CO – Course Outcomes

Knowledge Level: K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze).

MAPPING WITH PROGRAMME OUTCOMES:

COS	PO1	PO2	PO3	PO5	PO6
CO1	S	M	S	S	S
CO2	M	M	S	S	M
CO3	S	S	M	M	S
CO4	S	S	M	S	M
CO5	S	M	M	S	S

(S- Strong; M-Medium; L – Low)

UNIT I

Cells and Organs of the Immune system

10 Hours

Types of immunity - Innate and Acquired immunity. Structure and function of Immune cells- Lymphocytes, macrophages, monocytes, granulocytes and dendritic cells- Mechanism of phagocytosis. Lymphoid organs - Bone marrow, Thymus, Bursa of Fabricius, Lymph node and Spleen.

UNIT II

Types of Immunity

5 Hours

Antigens - definition, antigenicity, antigenic determinant, Haptens, adjuvants and epitopes. Antibodies - structure, classification and function. Complement - nomenclature and function, Complement pathways – classical and alternative pathway.

Immune Response - Primary and Secondary Immune response. Humoral and Cell mediated immunity.

UNIT III

Vaccines and Immunotechniques

10 Hours

Immunization practices- Active and Passive immunization. Vaccines - killed and attenuated organisms, Toxoids, Recombinant vaccines, DNA vaccines, Multivalent subunit vaccines. Commonly used vaccines for corona infection.

Immune techniques - Immunoelectrophoresis, Immunoprecipitation, RIA, ELISA, Immunoblotting and Immunofluorescence, Complement fixation test.

UNIT IV

Antibody biosynthesis and MHC complex.

10 Hours

Antibody biosynthesis - Theories of antibody formation- side chain and clonal selection theory. Monoclonal antibodies – Hybridoma Technology and its application.

MHC complex - Gene organization, HLA genes, class I and II antigens, Structure and function.

UNIT V

Immune disorders

10 Hours

Immunotolerance, Immuno deficiency disorders – Primary and Secondary Immunodeficiency diseases. Hypersensitivity types, Autoimmunity - the spectrum of autoimmune diseases, diagnostic aspects and treatment. Tumor immunology - Tumor antigens and Immune response to tumor.

SARS-CoV-2 : Life cycle, pathophysiology and rationalized treatments.

AIDS: Pathogenesis, HIV life cycle, diagnostic aspects and treatment.

DISTRIBUTION OF MARKS: Theory - 100% and Problems – Nil

TEACHING METHODOLOGY:

- Black Board
- Power Point Presentations
- Assignments
- Models
- Demonstrations

TEXT BOOKS:

S.NO	AUTHOR	TITLE	PUBLISHER	YEAR OF PUBLICATION
1	N. Arumugam, Dulsy Fatima,	Immunology	Saras Publication	2014
2	NandhiniShetty	Immunology	New age international (p) limited.	2 nd edition 2005
3	https://www.abebooks.com/servlet/SearchResults?an=joshi%20osama&cm_sp=det- -bdp- -author Joshi Kr/Osama	Immunology	Agrobios (India)	5 th edition 2012

REFERENCE BOOKS:

S.NO	AUTHOR	TITLE	PUBLISHER	YEAR OF PUBLICATION
1	Kuby	Immunology	W.H.Freeman and company	4 th edition 2000
2	Ivan M. Roitt	Essential Immunology	Wiley-Blackwell	9 th edition 1997
3	D. M. Weir and John Stewart	Immunology	Churchill Livingston	8 th edition 1997
4	Janeway's and Kenneth Murphy	Immunobiology	Garland Science	9 th edition 2016
5	William E. Paul	Fundamental Immunology	Lippincott Williams and Wilkins	7 th edition 2012
6	Jeffrey K. Actor	Introductory Immunology	Academic Press	1 edition 2014
7	David Male	Immunology	Saunders	8 edition 2012
8	Helen Chapel	Essentials of Clinical Immunology	Wiley-Blackwell	5 th Revised edition 2006

WEB SOURCES:

- www.immunology.org
- [https://en.wikibooks.org/wiki/Immunology/Organs of the Immune System](https://en.wikibooks.org/wiki/Immunology/Organs_of_the_Immune_System)
- <https://teachmephysiology.com/immune-system/adaptive-immune-system/antigen-processing-presentation/>
- www.immunopaedia.org.za
- www.microbiologybook.org/mobile/m.immuno-18.htm
- www.tusculum.edu/faculty/home/ivanlare/html/genetics/antibodies-master.html

SYLLABUS DESIGNER:

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