IMMUNOLOGY

Sem	Sub. Code	Category	Lecture		Theory		Practical		Credit
			Hrs/ week	Hrs / sem.	Hrs/ week	Hrs/ sem.	Hrs/ week	Hrs/ sem.	
VI		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	**K4**

	and treatment of Hypersensitivity, Immunodeficiency diseases and auto immune diseases.	

(*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)

Total Hours: 45

UNIT I

Cells and Organs of the Immune system 10 hrs

Types of immunity - Innate and Acquired immunity. Structure and function of cells involved in immunity. Lymphoid organs - Bone marrow, Thymus, Bursa of fabricus, Lymph node and Spleen.

UNIT II

Types of Immunity 5 hrs

Antigens - definition, antigenicity, antigenic determinant, Hapten and epitopes. Antibodies - structure, classification and function. Complements – 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 hrs

Immunization practices- Active and Passive immunization. Vaccines - killed and attenuated organisms, Toxoids, Recombinant vaccines, DNA vaccines, Multivalent subunit vaccines.

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

UNIT IV

Antibody biosynthesis and MHC complex. 10 hrs

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 hrs

Immunotolerance, Immuno deficiency disorders – Primary and Secondary Immunodeficiency diseases. Hypersensitivity types, Autoimmunity - the spectrum of autoimmune diseases, diagnostic aspects and treatment.

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

Tumor immunology - Tumor antigens and Immune response to tumor.

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	Nandhini Shetty	Immunology	New age international (p) limited.	2nd edition 2005
3	Joshi Kr/Osama	Immunology	Agrobios (India)	5th edition 2012

REFERENCE BOOKS:

S.NO	AUTHOR	TITLE	PUBLISHER	YEAR OF PUBLICATION
1	Kuby	Immunology	W.H.Freeman and company	4th edition 2000
2	Ivan M. Roitt	Essential Immunology	Wiley-Blackwell	9th edition 1997
3	D. M. Weir and John Stewart	Immunology	Churchill Livingston	8th edition 1997
4	Janeway's and Kenneth Murphy	Immunobiology	Garland Science	9th edition 2016
5	William E. Paul	Fundamental Immunology	Lippincott Williams and Wilkins	7th 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	5th Revised edition 2006

WEB SOURCES:

- www.immunology.org
- 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

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