BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
SECOND SEMESTER 2022-2023
(Course Handout Part II)

16.01.2023

In addition to part I (general handout for all courses appended to the timetable) this portion gives further specific details regarding the course.

Course No. : BIO F342
Course Title : Immunology
Instructor in Charge : PROF. VIDYA RAJESH
Lecture Instructors : Prof. Trinath Jamma (1-20 lectures) and Prof. Vidya Rajesh (21-40) Tutorial Instructor : Trinath Jamma and Vidya Rajesh (respective portions).

Course Description: Introduction to immune system, cell mediated and humoral **i**mmunity, immunity to infectious diseases, immune mechanisms involved in cancer, immunodeficiency, autoimmunity, vaccination and organ transplantation.

Scope and objective of the course: This course has been designed to provide an insight in the concept and latest developments in immunology. Emphasis will be given on developing a molecular, cellular and clinical perspective of the area.

1. **Text Book (TB):** Kuby Immunology by Kindt et al., 6th Ed. Freeman press. 2007.

2. **Reference Book (RB)**

RB1 - Kuby Immunology by Owen et al., 7th Ed. Freeman press. 2013
RB2 - Immunology: An Introduction, Tizard, Cengage publication, 4th Ed. 2010
RB3- Cellular and Molecular Immunology by Abul K. Abbas *et al*; 7th Ed., Elsevier press. 2012

3. **Course Plan:**

Lect. #	Learning Objectives	Topics to be covered	Reference
1-2	Introduction and overview of the Immune system	Introduction to immunology, concept of innate and adaptive immunity	TB Chapter 1
3-4	Cells and organs of the immune system	Hematopoiesis, cells and organs of the immune system (only functional aspects)	TB Chapter 2
5-6	Innate immunity	Natural barriers, effector cells and molecules, receptors and signaling	TB Chapter 3

7-8	Antigens and Antibodies	Hapten and antigens, Immunogenicity and antigenicity, epitopes, antibody classes and biological activities	TB Chapter 4

9-11	Organization and expression of immunoglobulin genes	Multigene organization of Ig genes and gene rearrangement (B cell receptors)	TB Chapter 5
12-15	B cell generation, activation and differentiation	B cell maturation, activation, proliferation, humoral response, regulation of immune effector response	TB Chapter 11
16-17	The Complement system	Complement activation, function, components and regulation	TB Chapter 7
18-20	Major Histo-compatibility Complex and antigen presentation	Types, structures, cellular distribution, antigen processing and presentation	TB Chapter 8
21-22	T cell receptor	αβ and γδ TCR's structures and roles, Organization and rearrangement of TCR genes, 3D structures of TCR-peptide – MHC complexes.	TB Chapter 9
22-24	T cell maturation, activation and differentiation and effector function	Thymic selection, T cell activation, T-cell differentiation, Cell mediated cytotoxic response	TB Chapter 10, 14
25-26	Cytokines	Properties, receptors, functions and methods of analysis	TB Chapter 12
27-28	Hypersensitivity	Types of hypersensitivity & related problems	TB Chapter 15
29-30	Tolerance and Autoimmunity	Tolerance, organ specific and systemic autoimmune diseases	TB Chapter 16
31-32	AIDS, immuno-deficiencies and related diseases	Primary and secondary immunodeficiency's (concept only), AIDS, immuno-genetic disorder.	TB Chapter 20
33-34	Cancer and Immune System	Oncogenes and cancer induction, categories of cancer, immune evasion mechanisms during cancer and cancer immunotherapy	TB Chapter 21
35-36	Immune response to infectious diseases	Invasion by microbes, Immuno-evasion mechanisms, Covers immune reaction against viral, bacterial, fungal, parasitic and emerging diseases	TB Chapter 18
37 -	Vaccines and immune	Active and passive immunization,	TB Chapter 19

38	protection	recombinant bacterial and viral vaccines, subunit	

		vaccines,conjugate vaccines,	
39 -40	New developments in Immunology – recent trends and approaches	Holistic application and understanding of new clinical developments in Immunology with recent examples	Discussion based approach and class notes and references will be provided

4. Evaluation scheme: Course total – 200.

EC No.	Evaluation Component	Duration	Weightage (%) and Marks	Date, Time & Venue	Nature
1.	Mid-semester	90 min	25 (50 marks)	18/03 (2:00 – 3:30 p.m)	CB
2.	Classroom participation (This course needs students to focus in classroom to understand concepts)	Presence, attentiveness and interaction during lectures and tutorials	5 (10 Marks) (Can start with 0 too)	Every class	Final marks based on observation of team – No appeal on marks
3.	Announced Quizzes - 02	One before mid- semester and one after mid semester	20 (40 marks)	Tutorial hours	CB
4.	Group Assignment -1	Team of max. 3 students	10 (20 marks)	Summarizing any one assigned chapter in the form of a A3 poster	OB
5.	Compre exam	3 hours	40 (80 marks)	20/05 FN	CB + OB (20% CB

					+ 20% OB)

5. **Chamber consultancy hour**: To be announced in classroom or tutorial.
6. **Notices**: Notices will be displayed on CMS.
7. **Make up Policy**: Make-up decisions will be made on a case-by-case basis and only genuine cases as determined by the team and validated by Wardens and/or Medical Officer will be considered. However, there will be no make-up for assignments and surprise quizzes.
8. **Note on academic honesty and integrity policy:** Academic honesty and integrity are to be maintained by all the students throughout the semester and no type of academic dishonesty is acceptable.

Instructor In Charge, BIO F342 Immunology.