BIRLA INSTITUTE OF TECHNOLOGY AND SCIENCE, PILANI
INSTRUCTION DIVISION
SECOND SEMESTER 2015-2016
(Course Handout Part II)

Dated: Jan 05, 2016

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 : **SANJEEV KUMAR**
: **Shilpi Garg**

1. **Course Description**: Introduction to immune system, cell mediated and humoral immunity, immunity to infectious diseases, immune mechanisms involved in cancer and transplantation immunology**.**

2. **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.

3. Text Book (TB): Kuby Immunology by Owen et al., 7th Ed. Freeman press. 2013.

4. **Reference Book (RB):** The Elements of Immunology by Fatim Khan. Pearsons Education. 2009

5. Course Plan:

Lect. #	Learning Objectives	Topics to be covered	Reference *
1-2	Overview	Introduction, Innate immunity, Adaptive immunity	TB Ch 1
3-4	Cells and organs of the immune system	Hematopoiesis, cells and organs of the immune system (only functional aspects)	TB Ch 2
5-6	Innate immunity	Natural barriers, effector molecules, receptors	TB Ch 5; RB Ch 23
7-9	Antigens and Antibodies	Hapten and antigens, Immunogenicity and antigenicity, epitopes, structure of antibody, classes and biological activities, antigenic determinants	TB Ch 4
10-12	Organization and expression of immunoglobulin genes	Multigene organization of Ig genes, somatic rearrangement, antibody diversity and class switching	TB Ch 5
13-14	The Complement system	Complement activation, function, components and regulation, evasion of complement system and deficiencies	TB Ch 7
15-17	Major Histocompatibility Complex and antigen presentation	Types, structures, cellular distribution, self MHC restriction, antigen processing and presentation	TB Ch 8

18-21	T and B cell activation	T and B cell receptor complex, MHC-TCR interactions, T and B cell activation, differentiation and effector functions	TB Ch 9, 10, 11, 14
22-23	Cytokines	Properties, functions and related diseases	TB Ch 12
24-26	Tolerance and Autoimmunity	Thymic education, tolerance, organ specific & systemic autoimmune diseases	TB Ch 16
27-28	Hypersensitivity	Types of hypersensitivity and related problems	TB Ch 15
29-31	AIDS, immunodeficiencies	Primary and secondary immunodeficiency's (concept only), AIDS	TB Ch 7, 12, 20
32-34	Cancer and Immune system	Oncogenes and cancer induction, tumor of the immune system, tumor evasion and cancer Immunotherapy	TB Ch 21
35-36	Infectious diseases and Vaccines	Types of infectious diseases, immune invasion by microbes, Active and passive immunization, recombinant-vector and DNA vaccines, multivalent subunit vaccines	TB Ch 18, 19; RB Ch 24
37-38	Tools, techniques and advancements in immunology	Antigen-antibody interaction, SPR, agglutinations, RIA, ELISPOT, ADCC, Microarray principles and concepts	TB Ch 5, 6, 14 class notes
39-40	Clinical advancements in immunology	Monoclonals, abzymes, antibody engineering, therapeutic uses of antibodies and cytokines, HLA and transplantation, Immune markers in disease diagnostics, Treatment of autoimmune diseases	TB Ch 5, 6, 8, 14, 16, 17, 21, class notes

* Class notes will also be included in addition to these references.

6. Evaluation scheme:

Component	Duration	Weightage (%)	Date & Time	Venue	Remarks
Mid Sem test	1.5 h	25	14/3 9:00 - 10:30 AM		CB
Quizzes		20			CB
Assignments and seminars		15			CB/OB
Compre Exam	3 h	40	3/5 FN		CB/OB

7. **Chamber consultancy hour**: To be announced in class room

8. **Notices:** Notices will be displayed on Bio Notice Board or Nalanda

9. **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

Instructor In charge
BIO F342