



Birla Institute of Technology and Science, Pilani

Hyderabad Campus

INSTRUCTION DIVISION
FIRST SEMESTER 2016-2017
course Handout Part II

1 AUGUST 2016

Course Handout (Part II) for BIO F111 (General Biology)

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

Instructor-in-charge: DEBASHREE BANDYOPADHYAY

Team of instructors: Vidya Rajesh
V. Ramakrishna
P. Sankar Ganesh
Jayati Ray Dutta
Sridev Mohapatra

Course description: Living System and their properties, major biological compounds, basic biochemical and physiological processes, introduction to genetics and recombinant DNA technology.

Scope and objectives: The course is aimed at providing the introduction of biological system with respect to nature, behavior and functioning of the cell. The intricate relationship of the living organism with its environment at the molecular level is highlighted so that the impact of the modern biological researches can be understood and appreciated.

Text book: **T:** Eldon D. Enger, Frederick C. Ross and David B. Bailey, Concepts in Biology, 14th Edition (BITS Pilani Custom Edition) Tata McGraw Hill Publishing Company Limited, 2012.

Reference books: **R1:** Peter H. Raven, George B. Johnson, Jonathan B. Losos, Susan R. Singer Biology, 7th Edition. WBC McGraw Hill, 2005.

R2: C. Starr, Biology: Concept and application, 6th Edition, Thomson Learning.

Suggested reading: **S1:** Campbell, N.A., Reece J.B., Biology, 7th Edition, Pearson Education Inc, 2009.
S2: Campbell, N.A., *et. al.* Essential Biology with Physiology, 2nd Edition Pearson Education Inc, 2009.

Course Plan:

Lecture No.	Learning objectives	Topics to be covered	Reference Chap/Sec (Books)
1	Introduction	Brief introduction to all aspects of biology	1; section 1.4 (T)
2	The chemistry of life: Organic Molecules – The Molecules of Life	Carbohydrates and lipids	3 (T)
3			
4		Proteins and nucleic acids	
5	Cell structure and Function	Cell theory, cell membrane and transport	4 (T)
6		Membranous organelles	
7		Non-membranous organelles, Nuclear components and major cell types	
8	Enzymes, coenzymes and Energy	Nomenclature Bio-catalysis: Hypotheses	5 (T)
9		Environmental factors, co-enzymes, enzyme activation and inhibition	
10	Biochemical pathways	Introduction, Glycolysis	6 & 7 (T)

11		TCA cycle, ETS,	
12		ATP calculation and fermentation	
13		Protein and fat metabolism, Photosynthesis	
14	Taxonomy	The classification and Evolution of Organisms	20 (T)
15		A brief survey of domains, acellular infectious particles	
16	DNA & RNA: The Molecular Basis of Heredity	Central Dogma, molecular structures, duplex DNA and DNA replication.	8 (T)
17		Gene expression: Transcription and translation	
18		Mutation and mutagenesis	
19	A p p l i c a t i o n s o f Biotechnology	Introduction, polymerase chain reaction, DNA fingerprinting,	11 (T)
20		DNA sequencing, Human genome project	
21		Genetic modification of organisms, Cloning of organisms: Illustration (Dolly), Stem cells, Biotechnology & Ethics	
22	Cell division: Mitosis (Cell copying process) and Meiosis (Sex cell formation)	Cell cycle: The stages of mitosis	9 (T)
23		Abnormal cell division: Basis of oncology	
24		Introduction Meiosis I & II and crossing over	
25		Nondisjunction, sex determination and comparison of mitosis & meiosis	
26	Mendelian genetics (Concepts and problems)	Introduction, Inheritance patterns and laws,	10 (T)
27		Multiple allelism, Sex linked inheritance, Pleiotropy,	
28		Polygenic Inheritance and Environmental Influences	
29			
30	Genetic diversity within species	Speciation, gene pool concept, Hardy-Weinberg equilibrium and its applications	12.1 - 12.4 13.1 - 13.5 & 13.9 (T)
31			
32	Material Exchanges in the body	Basic principle, Cardiovascular system: Blood,	24 (T)
33		heart, blood vessels and lymphatic system, Respiratory system	
34		Obtaining nutrition: Mechanical and Chemical processing of food, Waste Disposal: Kidney structure & function	
35			
36	Body's control mechanism	Nervous system: Nerve impulse, events at the synapse and CNS organization,	26 (T)
37		Endocrine system,	
38		Sensory input (Chem & Ear), sensory input (Eye & skin) and output coordination	
39		Immune system and defense mechanisms	
40		Humeral and cell-mediated immune responses, Blood typing and AIDS	
41	Sex and reproduction	Chromosomal determination of sex, male and female fetal development, hormonal control of fertility, fertilization, pregnancy and contraception	27 (T)
42			

Self-study: Ecology – Ecosystem organization and energy flow: Chapter 15.1 to 15.3 (T); Nutrition – Food and Diet: Chapter 25 (T).

These portions will be included in evaluation components such as T1, T2 and Comprehensive exams

Evaluation scheme

S. No.	Evaluation component*	Duration	Weightage	Date and time	Remarks
1	T-1	1 hour	20%	8/9, 4.00--5.00 PM	Closed book
2	T-2	1 hour	20%	25/10, 4.00--5.00 PM	Closed book
3	Surprise Quizzes (Multiple)	Diverse	20%		Closed book
5	Comprehensive Exam	3 hours	40%	09/12 FN	20% Closed book + 20% Open book

Surprise quizzes may be taken in lecture hours and/or tutorial hours

Chamber consultation hour: Please contact your section instructor

Notices: All notices regarding this course will be displayed on CMS only.

Grading policy: Award of grades will be guided in general by the histogram of marks. Decision on border line cases will be taken based on individual's sincerity, attendance in classes, and the section instructor's assessment of the student. Students missing one or more component of evaluation completely may be given NC.

Make-up policy: As per Clause 4.07 of BITS academic regulations booklet.
Make-up may be granted only in case of medical emergency and hospitalization.
Makeup for quizzes will not be granted under any circumstances.

**Instructor-in-Charge
BIO F111**