Birla Institute of Technology & Science, Pilani
Hyderabad Campus

FIRST SEMESTER 2019-2020

Course Handout (Part-II)

01.08.2019

In addition to part-I (General Handout for all courses) printed on page 1 of the timetable book, this portion gives further specific details regarding the course.

Course Number : BIO F214
Course Title : INTEGRATED BIOLOGY
Instructor-in-Charge : SUMAN KAPUR

1. Course Description:

The course intends to bridge the gap as well as opens new vistas to students taking up biology. The course covers two tracks, essentially. The first track introduces the student to the ordering that helps biologists to actually study the vast diversity of the living world. This track would encompass questions related to the origin and evolutionary pathways followed in nature, as well as the methods followed by biologists to systematically categorize and document them. The second track highlights the uses and applications of biology in everyday life – whether in the economic or in the social realms. Together, the course projects the subject in a way from which the student can choose and implement his biological knowledge vis-à-vis his/her interests.

2. Scope and Objectives:

Being the second course on general biology, the course exposes the students to those foundational aspects as described above. At the end of the course, the student will have developed a basic understanding of the evolutionary processes, rationale for taxonomic arrangements and familiarity of selected, representative members of the major kingdoms of living organisms. Further, the student will also become aware of how knowledge of biology is applied for creating opportunities for livelihood.

3. Textbook:

Raven P.H. and George B. Johnson. Systematics and Evolutionary Biology (BITS-Pilani Custom Edition 2012). New Delhi: Tata McGraw-Hill Publishing Company Ltd., 2012.

4. Reference Books:

RB1: Campbell, N.A., *et. al.* Essential Biology with Physiology (2nd edition). New Delhi: Pearson Education Inc., 2009.

RB2: Starr, Cecie. Biology: Concepts and Applications (6th edition). India: Thomson Brooks/Cole, 2007.

5. Lecture Plan:

Lect. No.	Learning Objectives	Topics to be covered	Chapter in the Text Book
1-3	Genes within populations	Genetic variation and evolution, Hardy-Weinberg principle; agents of evolutionary change; fitness; interaction among evolutionary forces; maintenance of variation; selection acting on traits; experimental studies on natural selection; limits of selection	20 TB
-24-7	Evidence for	Evidence of natural selection; artificial selection; fossil and	21 TB

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	evolution	anatomical evidence for evolution; convergent evolution; Darwin's critics	
8-10	Origin of species	The nature of species; the biological species concept; reproductive isolation; genetic drift and natural selection in speciation; geography of speciation; species clusters; pace of evolution; speciation and extinction	22 TB
11-14	Systematics and the phylogenetic revolution	Systematics; cladistics; systematics and classification; phylogenetics and comparative biology; phylogenetics and disease evolution	23 TB
15-16	Genome evolution	Comparative genomics; evolution of whole genomes	24 TB
17-19	Protists	Introduction to protists; origin and endosymbiosis; economic importance of and diseases associated with protists	29 TB
20-23	Green plants	Introduction to green algae, bryophytes, tracheophytes, lycophytes, pteridophytes and angiosperms; evolution of seed plants and their economic importance	30 TB
24-26	Fungi	Introduction to fungi; ecology, fungal parasites and pathogens; economic importance of fungi	31 TB
27-29	Overview of Animal Diversity	General features of animals; evolution of the animal body plan; the classification of animals	32 TB
30-35	Noncoelomate and Coelomate invertebrates	Some important features of non-coelomate and specific features of coelomate invertebrates	33, 34 TB
36-42	Vertebrates	Description of characteristics of fish, amphibians, reptiles, birds and mammals; evolution of the primates	35 TB

Select topics for self-reading from Reference Book 1 and 2: As announced in the class

6. Evaluation Scheme:

EC No.	Evaluation component	Duration	Weight	Date and Time	Nature of the Component
1	Midsem Test	90 min.	35%	4/10/2019 (11.00 – 12.30PM)	CB
2	Presentations/ Assignments	Variable	30% (5x6)	During regular classes and tutorial hours	OB
3	Comprehensive Examination	180 min.	35%	11/12/19 (AN)	CB+OB

Chamber consultation hour: To be announced in the class.

Notices: All notices will be displayed on the Biological Sciences Group notice board.

Make-up policy: Make-up decisions will be made on a case-by-case basis and only genuine cases as determined by the instructor and validated by Wardens and/or Medical Officer will be considered. No make-up for Quizzes/Presentations/Assignments.

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

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