Birla Institute of Technology & Science, Pilani
Hyderabad Campus

FIRST SEMESTER 2021-22
Course Handout Part II

Date: 20.08.2021

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. : **BITS F225**

Course Title : **ENVIRONMENTAL STUDIES**

Instructor-in-charge : **Himanshu Aggarwal**

Instructor : **Chandu Parimi; Debashree Bandyopadhyay**

Scope of the course:
The United Nations Conference on Environment and Development (UNCED) held in Rio De Janeiro in 1992, and the 1994 conference on United Nations Framework Convention on Climate Change (UNFCCC), and a very recent 2015 Paris Agreement have all drawn the attention of people around the globe to the condition of our environment. It is clear that no citizen of the earth can afford to be ignorant of the environmental issues.
Recognizing this fact, the Hon'ble Supreme Court of India directed the University Grants Commission to introduce a basic course on environment for every student enrolled for undergraduate education in India. Hence the course is designed in such a manner that all aspects of environment [Biological systems (flora & fauna), air, water, soil & geography, society, economy and aesthetics] are to be covered.

1. Objective of the course:

This course is of interdisciplinary nature where social, biological and engineering aspects of environment would be dealt with. The biotic and abiotic aspects of environment, the impact of anthropogenic activities on the environment and other physical, ecological, socio-political and economic issues will be discussed with appropriate real life examples and case studies in the course. The course would also briefly introduce students from different backgrounds to various concepts in air pollution, water pollution and solid waste management. It would also provide a student to have an engineering based solution to such issues. The course aims to impart learning through lectures, class room and field based self/ group activities in the immediate environment, exposure to internet resources, and other forms of multimedia on the subject.

2. Text book (TB):

Bharucha, E., 2013. *Textbook for Environmental Studies for Undergraduate Courses.* 2nd Ed. Universities Press.
https://www.ugc.ac.in/oldpdf/modelcurriculum/env.pdf

Reference Book (RB):

1. Centre for Science and Environment, 2017. *Environment Reader for Universities.*CSE.
2. Wright, R. T. & Boorse, D. F., 2012. *Environmental Science-Towards a Sustainable Future.11th Ed*. Prentice Hall.
3. Davis, M. L. & Cornwell, A. D., 2014. *Introduction to environmental Engineering.* McGraw Hill Education.
4. Masters, G. M. & Ela, W. P., 2008. *Introduction to Environmental Engineering Science.* PHI.
5. Miller, T. G. & Spoolman, S. E., 2013. *Environmental Science.* 14th Ed. Cengage Learning.

5. Course Plan:

Lecture No.	*Learning objectives*	*Topics to be covered*	*Learning Outcomes of the Lectures*	*Chapter in the Text Book*	*Dept*
1	Multidisciplinary nature of	Definition, Scope and Importance, Need for Public Awareness,	Understand the significance of environmental science	1-T1, 4-R1, 1-R2	All

	environmental studies	Institutions and significant contribution of pioneers in environmental conservation.	and environmental studies.		
2-5	Concept of ecosystems and its features	Ecosystems: Types and Function Food and ecological pyramids	Importance of equilibrium in ecosystem and ecological pyramids.	3-T1, 1-R1, 2-R2	Biological Sciences
6-9	Human population and environment	Dynamics of natural populations (growth curves), Mechanisms of population equilibrium (predator prey and competitive relationships), Evolution as a force for change, Human population growth and health, Challenges to development (cost of modernization), Role of information Technology in Environment and human health.	Understand the link between human population and environment. Relate to the concept of evolution. Comprehend the challenges in development or modernization at the cost of environment.	7-T1; 4,5,6-R2	
10-13	Biodiversity and its conservation	Introduction, Bio-geographical classification of India, Value of biodiversity, Biodiversity at global, National and local levels, India as a mega-diversity nation, Hot-spots of biodiversity, Threats to biodiversity, Endangered and endemic species of India, Conservation of biodiversity	Understand the local, national and global biodiversity and its conservation.	4-T1; 10,11- R2	
14-20	Natural resources and the impact of man-made activities on them	Natural resources and associated problems in forest resources, Water resources, Mineral resources, Food resources, Energy resources, Land resources; Role of an individual in conservation of natural resources; Equitable use of resources for sustainable lifestyles	Learn about different types of natural resources, impact of human activities on natural resources and identify the role of individuals in conservation of natural resources.	2-T1, 2-R1, 2-R2	Chemistry
21 -26	Environmental pollution	Definition, Cause, effects and control measures of Air pollution, Water pollution, Soil pollution, Noise pollution, Thermal pollution, Nuclear hazards; Solid waste Management: Causes, effects and control measures of urban and industrial wastes, waste to energy concept; Case studies	Identify the causes and effects of air, water, soil and noise pollution, etc. Learn about the ways to control the different types of pollution.		
27-33		Role of an individual in prevention of pollution: Acts pertaining to Environment; Issues involved in enforcement of environmental legislation EIA, Disaster management: floods, earthquake, cyclone and landslides.	Understand how individuals can play an important role in controlling different types of pollution. Learn about the challenges involved in implementation of environmental legislation.	5-T1; *5,7,9,10,11 & 12* - R3; *5,6,7,8,9* R4	Civil Engineering
34-40	Social issues and the environment	Unsustainable to Sustainable development, Urban problems related to energy; Water	Understand sustainable development and conservation of natural	6-T1, 1-4R1	

		conservation, rain water harvesting, watershed management, resettlement and rehabilitation of people; its problems and concerns; Environmental ethics: Issues and possible solutions, Wasteland reclamation, Consumerism and waste products, Global issues like Climate change, nuclear accidents, acid deposition and holocaust, Public awareness, Value Education	resources. Learn about environmental ethics and our role in saving environment.		

6. Evaluation scheme:

Evaluation component	*Duration*	*%*	*Date and time*	*Nature of the Component**
Mid Semester Examination	1.5 Hr.	30	20/10/2021 1.30 - 3.00PM	OB
Projects	Diverse	30	Continuous Evaluation	OB
Comprehensive Examination	2 Hr.	40	20/12 AN	OB

*OB: Open book.

7. Chamber consultation hour:

To be announced in the class.

8. 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, student's regularity in attending classes, and the section instructor's assessment of the student.

9. Make-up policy:

Make-up for Mid semester examination will be given only in genuine (medical emergency) cases of absence. If the absence is anticipated, before the examination, prior permission of the Instructor-in-charge is necessary. Make-up for projects are not given. Also refer to Clause 4.07 of BITS *Academic Regulations* for more details.

Notices:
All notices/ announcements regarding this course shall be displayed in Course Management System (CMS).

10. 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.

Himanshu Aggarwal
Instructor In-charge
BITS F225