

Academic Course Description

BHARATH UNIVERSITY
 Faculty of Engineering and Technology
 Department of Electrical and Electronics Engineering
BCE406ENVIRONMENTAL STUDIES
FourthSemester (EvenSemester)

Course (catalog) description

To give the students a fair knowledge on the environmental pollution.

Compulsory/Elective course :Compulsory for EEE students

Credit hours&contact hours :3 & 45

Course Coordinator : Ms.M.Aswothy

Instructors : Ms.M.Aswothy

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@bharathuniv.ac.in)	Consultation
Ms.M.Aswothy	Second year EEE	KS 101	04422290125	Hod.eee@gmail.com	12:30pm-1:30pm

Relationship to other courses:

Pre –requisites : Engineering Chemistry II

Assumed knowledge :The students study the integrated themes and biodiversity, natural resources, pollution control and waste management.

Syllabus Contents

.UNIT I THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES9

Definition, scope and importance, Need for public awareness.

Natural Resources : Renewable And Non – Renewable Resources

Natural resources and associated problems

- a) Forest resources : Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effect on forests and tribal people.
- b) Water resources : Use and over-utilization of surface and ground water, flood, drought conflicts over water, dams-benefits and problems.
- c) Mineral resources : Uses and exploitation, environmental effects of extracting and using mineral resources, case studies.

- d) Food resources : World food problems, changes caused by agriculture and overgrazing , effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
- e) Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, case studies.
- f) Land resources : Land as a resource, Land degradation, man induced landslides, soil erosion and desertification

Role of an individual in conservation of natural resources, Equitable use of resources for sustainable lifestyles.

UNIT II ECOSYSTEMS

Concepts of an ecosystem. Structure and function of an ecosystem, producers, consumers and decomposers, Energy flow in the ecosystem, Ecological succession, Food chains, food webs and ecological pyramids - Introduction, types, characteristic features, structure and function of the following ecosystem :- Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries)-

Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation - Ethics : Issues and possible Solutions, Climate change, global warming, acid rain, ozone layer depletion.

UNIT III BIODIVERSITY AND ITS CONSERVATION

Introduction and Definition - genetic, species and ecosystems diversity, Biogeographical classification of India - Value biodiversity : consumptive use, productive use, social, ethical, aesthetic and option values - Biodiversity at global, national and local levels. India as a mega-diversity nation, Hot-spots of biodiversity - Threats to biodiversity, habitat, poaching of wildlife, man-wildlife conflicts, Endangered and endemic species of India, Conservation biodiversity - In-situ and Ex-situ conservation of biodiversity.

Environmental Pollution

Definition, Causes, effects and control measures of :- Air Pollution, Water pollution, Soil Pollution, Marine Pollution, Noise pollution, Thermal pollution, Nuclear hazards. Solid waste Management : Causes, effects and control measures of urban and industrial wastes - Role of an individual in prevention of pollution - Pollution case studies - Disaster Management : floods earthquake, cyclone and landslides.

UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT

From Unsustainable to Sustainable development, Urban problems related to energy, nuclear accident and holocaust, case studies, wasteland reclamation, Environmental Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act, Wildlife protection Act, Forest Conservation Act, Issues involved in enforcement of environmental Legislation, public awareness – Fireworks and its impact on the Environment – Chemicals used in Fireworks – (Fuel –oxidizing Agent – Reducing Agent –Toxic Materials – Fuel –Binder- Regulator) – Harmful nature of ingredients – chemical effects on health due to inhaling fumes – Noise produced by fire crackers – Noise pollution – Noise level standards for fire crackers – Intensity of sound – Impact on hearing – Safety measures.

UNIT V HUMAN POPULATION AND THE ENVIRONMENT

Population growth, variation among nations, population explosion-Family Welfare programs, Environment and human health, Human Rights, Value Education, HIV and AIDS, Women and Child Welfare, Role of Information Technology in Environment and Human health - Case Studies.

Text book(s) and/or required materials

T1: Gilbert M.Masters, “Introduction to Environmental Engineering and Science”, Pearson Education Pvt., Ltd., Second Edition, ISBN 81-297-0277-0, 2004.

T2: Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc. 480p

T3: BharuchaErach, The Biodiversity of India, Mapin Publishing Pvt. Ltd.,Ahmedabad – 380 013, India, 1989.

T4: Benny Joseph, “Environmental Studies”., TATA McGraw Hill, 2010

Reference Books:

R1: Trivedi R.K., “Handbook of Environmental Laws, Rules, Guidelines, Compliances and Standards”, Vol.I and II, EnviroMedia 2009

R2: Cunningham, W.P.Cooper, T.H.Gorhani, “Environmental Encyclopedia”, Jaico Publ., House, Mumbai, 2001

Computer usage:

Professional component

General	-	100%
Basic Sciences	-	0%
Engineering sciences & Technical arts	-	0%
Professional subject	-	0%

Broad area:NIL

Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	February 2 nd week	Session 1 to 18	2 Periods
2	Cycle Test-2	March 2nd week	Session 19 to 36	2 Periods
3	Model Test	April 3rd week	Session 1 to 45	3 Hrs
4	University Examination	TBA	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome

To give the students a fair knowledge on the environmental pollution	Correlates to program outcome		
	H	M	L
CO1:To successfully understand the basics of Network Analysis & Synthesis theory	-	c,e,g,h,l	f,j,k
CO2:To make the students learn how to synthesize an electrical network from a given impedance/admittance function	-	C,e,g,h,l	F,j,k
CO3: Students will be able to analyze the various electrical and electronic networks using the techniques they learn.	C,e,h	B,f,g,I,l	J,k
CO4:Students will be able to construct a circuit to suit the need	e	C,f,g,h,l	-
CO5:Able to analyze resonant circuits both in time and frequency domains	-	C,e,f,g,,j	-

H: high correlation, M: medium correlation, L: low correlation

Draft Lecture Schedule:

S.NO	Topics	Problem solving (Yes/No)	Text / Chapter
UNIT I THE MULTIDISCIPLINARY NATURE OF ENVIRONMENTAL STUDIES			
1.	Definition, scope and importance, Need for public awareness. Natural Resources : Renewable And Non – Renewable Resources Natural resources and associated problems	NO	[T ₁]
2.	a) Forest resources : Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effect on forests and tribal people	NO	
3.	b) Water resources : Use and over-utilization of surface and ground water, flood, drought conflicts over water, dams-benefits and problems.	NO	
4.	c) Mineral resources : Uses and exploitation, environmental effects of extracting and using mineral resources, case studies.	NO	
5.	d) Food resources : World food problems, changes caused by agriculture and overgrazing , effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.	NO	
6.	e) Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, case studies	NO	
7.	e) Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources, case studies	NO	
8.	Land resources : Land as a resource, Land degradation, man induced landslides, soil erosion and desertification	NO	
9.	Land resources : Land as a resource, Land degradation, man induced landslides, soil erosion and desertification	NO	
10.	Test	NO	
UNIT II ECOSYSTEMS			
11.	Concepts of an ecosystem. Structure and function of an ecosystem	NO	[T ₂]
12.	producers, consumers and decomposers	NO	
13.	Energy flow in the ecosystem, Ecological succession	NO	

14.	producers, consumers and decomposers, Energy flow in the ecosystem	NO	
15.	Ecological succession, Food chains, food webs and ecological pyramids	NO	
16.	Introduction, types, characteristic features, structure and function of the following ecosystem :- Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems, (ponds, streams, lakes, rivers, oceans, estuaries)-	NO	
17.	Water conservation, rain water harvesting, watershed management, Resettlement and rehabilitation	NO	
18.	Ethics : Issues and possible Solutions, Climate change, global warming, acid rain, ozone layer depletion.	NO	
19.	Test	NO	
UNIT III BIODIVERSITY AND ITS CONSERVATION			
20.	Introduction and Definition - genetic, species and ecosystems diversity	NO	[T ₃]
21.	Biogeographical classification of India - Value biodiversity : consumptive use,	NO	
22.	productive use social, ethical, aesthetic and option values - Biodiversity at global, national and local levels	NO	
23.	India as a mega-diversity nation, Hot-spots of biodiversity -Threats to biodiversity,	NO	
24.	habitat, poaching of wildlife, man-wildlife conflicts	NO	
25.	Endangered and endemic species of India	NO	
26.	Conservation biodiversity - In-situ and Ex-situ conservation of biodiversity.	NO	
27.	Test	NO	
UNIT IV SOCIAL ISSUES AND THE ENVIRONMENT			
28.	From Unsustainable to Sustainable development, Urban problems related to energy	NO	[T ₄]
29.	nuclear accident and holocaust, case studies	NO	
30.	wasteland reclamation, Environmental Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and Control of Pollution) Act	NO	
31.	Wildlife protection Act, Forest Conservation Act, Issues involved in enforcement of environmental	NO	

	Legislation, public awareness		
32.	Fireworks and its impact on the Environment – Chemicals used in Fireworks – (Fuel –oxidizing Agent – Reducing Agent	NO	
33.	Toxic Materials – Fuel –Binder- Regulator) – Harmful nature of ingredients – chemical effects on health due to inhaling fume	NO	
34.	Noise produced by fire crackers – Noise pollution – Noise level standards for fire crackers	NO	
35.	Intensity of sound – Impact on hearing – Safety measures.	NO	
36.	Test	NO	
UNIT V HUMAN POPULATION AND THE ENVIRONMENT			
37.	Population growth, variation among nations	NO	[T ₄]
38.	population explosion-Family Welfare programs	NO	
39.	Rights Environment and human health, Human, Value Education	NO	
40.	HIV and AIDS, Women and Child Welfare	NO	
41.	Technology in Environment and Role of Information Human health - Case Studies.	NO	
42.	Technology in Environment and Role of Information Human health - Case Studies.	NO	
43.	Test	NO	
44.	Test	NO	
45.	Test	NO	

Teaching Strategies

The teaching in this course aims at establishing a good fundamental understanding of the areas covered using:

- Formal face-to-face lectures
- Tutorials, which allow for exercises in problem solving and allow time for students to resolve problems in understanding of lecture material.
- Laboratory sessions, which support the formal lecture material and also provide the student with practical construction, measurement and debugging skills.
- Small periodic quizzes, to enable you to assess your understanding of the concepts.

Evaluation Strategies

Cycle Test – I	-	05%
Cycle Test – II	-	05%
Model Test	-	10%
Attendance	-	05%
SEMINAR&ASSIGNMENT	-	05%
Final exam	-	70%

Dated :

Prepared by: Ms.M.Aswathy

Addendum

ABET Outcomes expected of graduates of B.Tech / EEE / program by the time that they graduate:

- a) An ability to apply knowledge of mathematics, science, and engineering fundamentals.
- b) An ability to identify, formulate, and solve engineering problems.
- c) An ability to design a system, component, or process to meet the desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
- d) An ability to design and conduct experiments, as well as to analyze and interpret data.
- e) An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.
- f) An ability to apply reasoning informed by the knowledge of contemporary issues.
- g) An ability to broaden the education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
- h) An ability to understand professional and ethical responsibility and apply them in engineering practices.
- i) An ability to function on multidisciplinary teams.
- j) An ability to communicate effectively with the engineering community and with society at large.
- k) An ability in understanding of the engineering and management principles and apply them in project and finance management as a leader and a member in a team.
- l) An ability to recognize the need for, and an ability to engage in life-long learning.

Program Educational Objectives

PEO1: PREPARATION

Electrical Engineering Graduates are in position with the knowledge of Basic Sciences in general and Electrical Engineering in particular so as to impart the necessary skill to analyze and synthesize electrical circuits, algorithms and complex apparatus.

PEO2: CORE COMPETENCE

Electrical Engineering Graduates have competence to provide technical knowledge, skill and also to identify, comprehend and solve problems in industry, research and academics related to power, information and electronics hardware.

PEO3: PROFESSIONALISM

Electrical Engineering Graduates are successfully work in various Industrial and Government organizations, both at the National and International level, with professional competence and ethical administrative acumen so as to be able to handle critical situations and meet deadlines.

PEO4: SKILL

Electrical Engineering Graduates have better opportunity to become a future researchers/ scientists with good communication skills so that they may be both good team-members and leaders with innovative ideas for a sustainable development.

PEO5: ETHICS

Electrical Engineering Graduates are framed to improve their technical and intellectual capabilities through life-long learning process with ethical feeling so as to become good teachers, either in a class or to juniors in industry.

BCE406- ENVIRONMENTAL STUDIES

Course Teacher	Signature
Ms.M.Aswathy	

Course Coordinator
(Ms.M.Aswathy)

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