Academic Course Description

BHARATH UNIVERSITY
Faculty of Engineering and Technology
Department of Civil Engineering

BCE062 ENVIRONMENTAL IMPACT ASSESSMENT

Sixth Semester, 2016-17 (Even Semester)

Course (catalog) description

To educate the students on the scope, steps involved and various methods related to assessment of environmental impact due to development projects

Compulsory/Elective course : Compulsory for Civil students

Credit/ Contact hours : 3 credits / 45 hours

Course Coordinator : Ms.M.Aswathy, Assistant Professor

Instructors :

Name of the instructor	Class handling	Office location	Office phone	Email (domain:@ bharathuniv.ac.in	Consultation
Ms.M.Aswathy	Final year Civil	Civil Block		aswathym026@gmail.com	9.00 - 9.50 AM

Relationship to other courses:

Pre –requisites : BCE505 Environmental Engineering

Assumed knowledge : Basic knowledge in rules and legislation related to pollution

Following courses : nil

Syllabus

Contents

UNIT I INTRODUCTION **9**

Environment Impact Assessment (EIA) - Environmental Impact statement – EIA in Project Cycle – Legal and Regulatory aspects in India according to Ministry of Environment and Forests – Types and Limitations of EIA- cross sectoral issues and terms of references in EIA- participation of Public and Non-Governmental Organizations in environmental decision making.

UNIT II COMPONENTS AND METHODS **9**

Components of EIA – Processes – screening – scoping – setting – analysis - mitigation. Matrices-Networks –Checklists – connections and combinations of processes – Cost benefit analysis - Analysis of alternatives - Software packages for EIA-Expert systems in EIA.

UNITIII PREDICTION, ASSESSMENT OF IMPACTS AND REPORTING **9**

Prediction tools for EIA-Mathematical modeling for impact prediction-Assessment of impacts-air-water-soil-noise-biological-socio-cultural environments-Cumulative Impact Assessment-Documentation of EIA findings-planning-organization of information and visual display materials-Report preparation.

UNIT IV ENVIRONMENTAL MANAGEMENT PLAN **9**

Environmental Management Plan-preparation, implementation and review- Mitigation and Rehabilitation Plans-Policy and guidelines for planning and monitoring programmes - post project audit-Ethical and Quality aspects of Environmental Impact Assessment.

UNIT V CASE STUDIES **9**

Case studies related to the following sectors-Infrastructure-Mining-industrial-Thermal Power –River valley and Hydroelectric-Nuclear Power.

REFERENCES:

1.Lawrence, D.P., Environmental Impact Assessment - Practical Solutions to Recurrent Problems, Wiley- Interscience, New Jersey, 2003.

2.Petts, J., Handbook of Environmental Impact Assessment, Vol., I and II, Blackwell Science London,1999.

3.Canter, L.W., Environmental Impact Assessment , McGraw- Hill, New York,1996.

4.Biswas, A.K. and Agarwala, S.B.C. Environmental Impact Assessment for Developing Countries, Butterworth Heinemann, London,1994.

5. The World Bank Group, Environmental Assessment Source Book Vol. I, II and III. The World Bank, Washington,1991.

Computer usage: Nil

Professional component

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

Broad area: Pollution control,waste management

Test Schedule

S. No.	Test	Tentative Date	Portions	Duration
1	Cycle Test-1	Feb 1st week	Session 1 to 14	2 Periods
2	Cycle Test-2	march 2nd week	Session 15 to 28	2 Periods
3	Model Test	April 2nd week	Session 1 to 45	3 Hrs
4	University Examination	TBA	All sessions / Units	3 Hrs.

Mapping of Instructional Objectives with Program Outcome

This Course is to introduce the principles of various Environmental impact assessment methods and applications to Civil Engineering projects	Correlates to program outcome		
	H	**M**	**L**
1. To make them understand the basics of EIA and its limitations across sectoral issues and terms of references in EIA. It also includes the study of participation of Public and Non-Governmental Organizations in environmental decision making.	a,	b,d	e
2. To understand about the methods and components of EIA and to learn about the expert systems	b \	d	a
3. To understand in detail about the prediction tools for EIA along with the mathematical modeling for impact prediction	a,b	d	e
4. To improve the knowledge on the ethical and quality aspects of Environmental Impact Assessment	a	E	
5. To know in detail about the Case studies of EIA related to the various sectors in a country like infrastructure, sources of energy etc.	a	E	

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

Draft Lecture Schedule

Session		Topics	Problem Solving	Text /Chapter
			Yes/No	
UNIT 1 INTRODUCTION				
1.		Environment Impact Assessment (EIA)	No	
2.		Environmental Impact statement	No	
3.		EIA in Project Cycle	No	
4.		Legal and Regulatory aspects in India according to Ministry of Environment and Forests	No	T1/Chapter 1
5.		Types and Limitations of EIA-	No	R1/Chapter 1
6.		cross sectoral issues and terms of references in EIA	No	R4/Chapter 1
7.		participation of Public Organizations in environmental decision making.	No	

8.	participation of Non-Governmental Organizations in environmental decision making.	No	
9.	Revision Test	No	
UNIT II	**COMPONENTS AND METHODS**		
10.	Components of EIA	No	
11.	Processes, Matrices-Networks –Checklists	No	
12.	Screening, scoping	No	
13.	setting – analysis - mitigation	No	T2/chapter 1
14.	connections and combinations of processes –	No	R1/Chapter 2
15.	Cost benefit analysis	No	R4/Chapter 2
16.	Analysis of alternatives	No	
17.	- Software packages for EIA-	No	
18.	Expert systems in EIA.	No	
UNIT III	**PREDICTION, ASSESSMENT OF IMPACTS AND REPORTING**		
19.	Prediction tools for EIA	No	
20.	Mathematical modeling for impact prediction-	No	
21.	Assessment of impacts	No	T2/chapter 2
22.	air-water-soil-noise-biological-socio-cultural environments-	No	R2/Chapter 2
23.	Cumulative Impact Assessment-Documentation of EIA findings	No	R4/Chapter 3
24.	Planning	No	
25.	organization of information	No	
26.	visual display materials	No	
27.	Report preparation	No	
UNIT IV	**ENVIRONMENTAL MANAGEMENT PLAN**		
28.	Environmental Management Plan	No	
29.	Preparation	No	
30.	Implementation	No	T1/chapter 3 R3/Chapter 4
31.	review- Mitigation Plans	No	R4/Chapter 4
32.	review- Rehabilitation Plans	No	
33.	Policy and guidelines for planning and monitoring programmes	No	
34.	post project audit	No	
35.	Ethical aspects of Environmental Impact Assessment.	No	
36.	Quality aspects of Environmental Impact Assessment.	No	
UNIT V	**CASE STUDIES**		
37.	9 Case studies related to the following sectors-Infrastructure	No	
38.	Mining	No	
39.	industrial-	No	

40.	Thermal Power	No	T1/chapter 5 R3/Chapter 5 R5/Chapter1
41.	River valley	No	
42.	Hydroelectric	No	
43.	Nuclear Power	No	
44.	Revision test	No	
45.	Discussion	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	-	5%
Cycle Test – II	-	5%
Model Test	-	5%
Assignment	-	5%
Attendance	-	10%
Final exam	-	70%

Prepared by: Ms.M.Aswathy Assistant Professor , Department of Civil **Dated :**

Addendum

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

a. An ability to apply knowledge of mathematics, science, and engineering
b. An ability to design and conduct experiments, as well as to analyze and interpret data
c. An ability to design a hardware and software system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
d. An ability to function on multidisciplinary teams
e. An ability to identify, formulate, and solve engineering problems
f. An understanding of professional and ethical responsibility
g. An ability to communicate effectively
h. The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
i. A recognition of the need for, and an ability to engage in life-long learning
j. A knowledge of contemporary issues
k. An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Program Educational Objectives

PEO1: PREPARATION

Civil Engineering graduates will have knowledge to apply the fundamental principles for a successful profession and/or for higher education in Civil Engineering based on mathematical, scientific and engineering principles, to solve realistic and field problems that arise in engineering and non engineering sectors

PEO2: CORE COMPETENCE

Civil Engineering graduates will adapt to the modern engineering tools and construction methods for planning, design, execution and maintenance of works with sustainable development in their profession.

PEO3: PROFESSIONALISM

Civil Engineering Graduates will exhibit professionalism, ethical attitude, communication and managerial skills, successful team work in various private and government organizations both at the national and international level in their profession and adapt to current trends with lifelong learning.

PEO4: SKILL

Civil Engineering graduates will be trained for developing soft skills such as proficiency in many languages, technical communication, verbal, logical, analytical, comprehension, team building, inter personal relationship, group discussion and leadership skill to become a better professional.

PEO5: ETHICS

Civil Engineering graduates will be installed with ethical feeling, encouraged to make decisions that are safe and environmentally-responsible and also innovative for societal improvement.

BCE062 Environmental Impact Assessment

Course Teacher	Signature
Ms.M,Aswathy	

Course Coordinator **HOD/CIVIL**