

|        |                                    |          |   |   |   |        |                         |
|--------|------------------------------------|----------|---|---|---|--------|-------------------------|
| CET415 | ENVIRONMENTAL<br>IMPACT ASSESSMENT | CATEGORY | L | T | P | CREDIT | YEAR OF<br>INTRODUCTION |
|        |                                    | OEC      | 2 | 1 | 0 | 3      | 2019                    |

**Preamble :** This course introduces the methodologies for identifying, predicting, evaluating and mitigating the impacts on environment due to any developmental project or activities. Students will learn how to prepare an impact assessment report and devise an environment management plan. Sufficient background will be provided on the environmental clearance procedures in India.

**Prerequisite:** NIL

**Course Outcomes:** After the completion of the course the student will be able to

| Course Outcome | Description of Course Outcome   | Prescribed learning level |
|----------------|---|---------------------------|
| CO1            | Explain the need for minimizing the environmental impacts of developmental activities             | Understand                |
| CO2            | Outline environmental legislation & clearance procedure in the country                            | Remember, Understand      |
| CO 3           | Apply various methodologies for assessing the environmental impacts of any developmental activity | Apply & Analyse           |
| CO 4           | Prepare an environmental impact assessment report   | Analy & Evaluate          |
| CO 5           | Conduct an environmental audit  | Analyse & Evaluate        |

**Mapping of course outcomes with program outcomes (Minimum requirement)**

|      | PO 1 | PO 2 | PO 3 | PO 4 | PO 5 | PO 6 | PO 7 | PO 8 | PO 9 | PO 10 | PO 11 | PO 12 |
|------|------|------|------|------|------|------|------|------|------|-------|-------|-------|
| CO 1 | -    | -    | -    | -    | -    | 2    | 2    | -    | -    | -     | -     | -     |
| CO 2 | -    | -    | -    | -    | -    | 2    | -    | -    | -    | -     | -     | -     |
| CO 3 | 2    | -    | -    | 3    | 2    | -    | 3    | -    | -    | -     | -     | -     |
| CO4  | -    | -    | -    | 2    | -    | 2    | 2    | 3    | -    | 3     | -     | -     |
| CO5  | -    | -    | -    | 2    | 1    | -    | 2    | 2    | -    | 2     | -     | -     |

**Assessment Pattern**

| Bloom's Category | Continuous Assessment Tests |    | End Semester Examination |
|------------------|-----------------------------|----|--------------------------|
|                  | 1                           | 2  |                          |
| Remember         | 10                          | 10 | 15                       |
| Understand       | 10                          | 10 | 15                       |
| Apply            | 15                          | 15 | 35                       |
| Analyse          | 15                          | 15 | 35                       |
| Evaluate         |                             |    |                          |
| Create           |                             |    |                          |

**Mark distribution**

| Total Marks | CIE | ESE | ESE Duration |
|-------------|-----|-----|--------------|
| 150         | 50  | 100 | 3 hours      |

**Continuous Internal Evaluation Pattern:**

|  |            |
|--|------------|
| Attendance                             | : 10 marks |
| Continuous Assessment Test (2 numbers) | : 25 marks |
| Assignment/Quiz/Course project         | : 15 marks |

**End Semester Examination Pattern:**

There will be two parts; Part A and Part B. Part A contain 10 questions with 2 questions from each module, having 3 marks for each question. Students should answer all questions. Part B contains 2 questions from each module of which student should answer any one. Each question carries 14 marks and can have maximum 2 sub-divisions.

**Course Level Assessment Questions**

**CO1: Explain the need for minimizing the environmental impacts of developmental activities**

- 1.Explain the evolution of EIA in India
- 2.Explain why EIA is needed for developmental projects.

3. What are the different ways in which development projects impact the water quality and quantity?

**CO 2: Outline the environmental legislation & clearance procedure in the country**

1. Two municipalities in Kerala plan to set up a Common Municipal Solid Waste Management Facility (CMSWMF). Explain the procedure required for the Environmental Clearance (EC) for the project as per the EIA Notification of 2006. (All CMSWMFs are category B projects)

2. Describe the procedure for obtaining environmental clearance according to EIA notification 2006.

3. The Environment (Protection) Act, 1986 is called an umbrella legislation. Substantiate the statement.

**CO3: Apply various methodologies for assessing the environmental impacts of any developmental activity**

1. Prepare a simple checklist for assessment of socio economic impact due to the development of a highway.

2. Explain overlay mapping as an EIA method

3. Explain how to predict the impact of a highway project on air quality

**CO4: Prepare an environmental impact assessment report**

1. Explain the Terms of Reference (ToR) for EIA report of a highway project

2. Explain the structure of EIA report

3. Explain the importance of an environmental management plan.

**CO5: Conduct an environmental audit**

1. Explain the need for environmental auditing

2. What are the different types of environmental audits?

3. Explain the importance of ISO 14001 standard.

## Syllabus

### Module 1

Definition, Need for EIA, Evolution of EIA: Global & Indian scenario -Environmental legislations in India- The Water (Prevention & Control of Pollution) Act 1974, The Air (Prevention & Control of Pollution) Act 1981, The Environmental (Protection) Act 1986- Environmental standards for water, air and noise quality- EIA Notification 2006

### Module 2

Environmental clearance process in India: Screening, Scoping, Public Consultation, Appraisal-Form1-Category of projects- Generic structure of EIA report- Terms of Reference (ToR) -Types of EIA: strategic, regional, sectoral, project level- Rapid EIA and Comprehensive EIA- Initial Environmental Examination (IEE)

### Module 3

EIA methodologies: Ad hoc, checklist, matrix, network and overlay- Impact Prediction, Evaluation and Mitigation-Prediction and assessment of the impact on water (surface water and groundwater), air, and noise environment- assessment of ecological impacts and Socio economic Impacts.

### Module 4

Environmental Management Plan (EMP): Goal and purpose- Importance of EMP- Content of an EMP- Role of environmental monitoring program  
Environment Audit: need for audit- audit types and benefits- environmental audit procedure  
ISO 14001 standards: Importance, salient features - Stages in implementation- Benefits

### Module 5

EIA case studies (Indian)- a highway project, a hydro electric power plant, an air port project, a quarry mining project and a solid waste management project

### Text Books:

1. Larry W Canter, "Environmental Impact Assessment", McGraw Hill Inc. , New York, 1995
2. Betty Bowers Marriott, Environmental Impact Assessment: A Practical Guide, McGraw-Hill Professional, 1997
3. Environmental Impact Assessment, 2003, Y.Anjaneyulu, B.S Publications

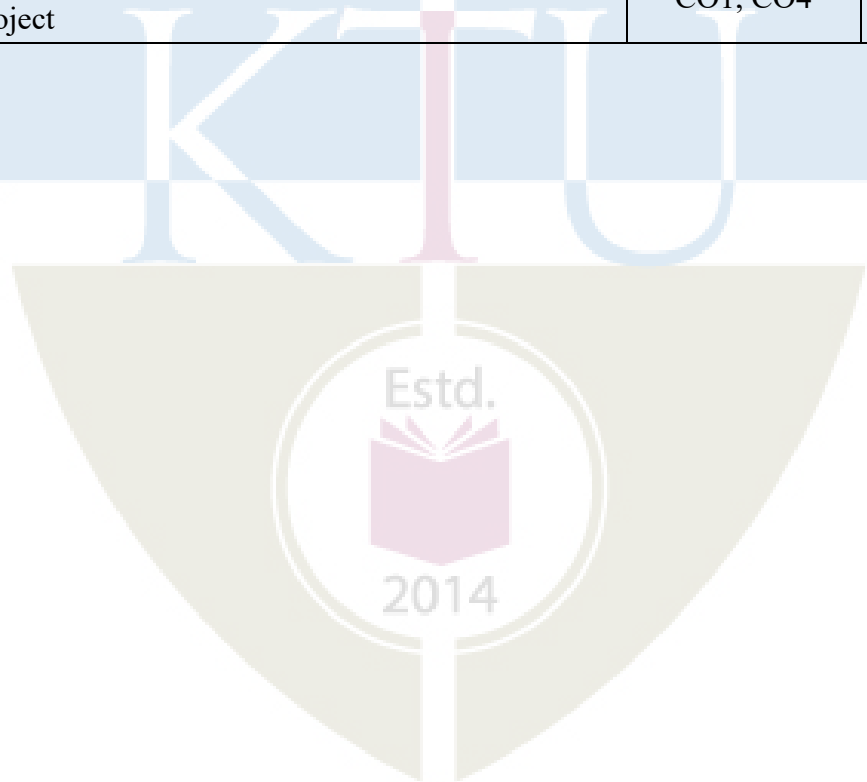
**References:**

1. Lawrence, David P., Environmental Impact Assessment (Practical Solutions to Recurrent Problems), Wiley International, New Jersey.
2. Ministry of Environment & Forests, Govt. of India 2006 EIA Notification
3. Jain, R.K., Urban, L.V. and Stacey, G.S., Environment Impact Analysis, Von Nostrand Reinhold Company.

**Course Contents and Lecture Schedule**

| Module   | Topic  | Course Outcomes addressed | No. of Lectures |
|----------|--|---------------------------|-----------------|
| <b>1</b> | <b>Module 1: Total Lecture Hours -7</b>  |                           |                 |
| 1.1      | Definition, Need for EIA, Evolution of EIA: Global & Indian scenario   | CO1                       | 1               |
| 1.2      | Environmental legislations in India- The Water (Prevention & Control of Pollution) Act 1974, The Air (Prevention & Control of Pollution) Act 1981, The Environmental (Protection) Act 1986 | CO2                       | 3               |
| 1.3      | Environmental standards for water, air and noise quality   | CO2                       | 1               |
| 1.4      | EIA Notification 2006  | CO2                       | 2               |
| <b>2</b> | <b>Module II: Total Lecture Hours- 7</b>   |                           |                 |
| 2.1      | Environmental clearance process in India: Screening, Scoping, Public Consultation, Appraisal- Form1-Category of projects   | CO2                       | 3               |
| 2.2      | Generic structure of EIA report- Terms of Reference (ToR)  | CO4                       | 1               |
| 2.3      | Types of EIA: strategic, regional, sectoral, project level-  | CO3                       | 1               |
| 2.4      | Rapid EIA and Comprehensive EIA  | CO3                       | 1               |
| 2.5      | Initial Environmental Examination (IEE)  | CO3                       | 1               |
| <b>3</b> | <b>Module III: Total Lecture Hours-7</b>   |                           |                 |
| 3.1      | EIA methodologies: Ad hoc, checklist, matrix, network and overlay  | CO3                       | 3               |
| 3.2      | Impact Prediction, Evaluation and Mitigation- Prediction and assessment of the impact on water (surface water and groundwater), air, and noise   | CO3                       | 2               |

|          |   |          |   |
|----------|---|----------|---|
|          | environment   |          |   |
| 3.3      | assessment of ecological impacts and Socio economic Impacts                                 | CO3      | 2 |
| <b>4</b> | <b>Module IV: Total Lecture Hours- 7</b>  |          |   |
| 4.1      | Environmental Management Plan (EMP): Goal and purpose- Importance of EMP- Content of an EMP | CO4      | 2 |
| 4.2      | Role of environmental monitoring program  | CO4      | 1 |
| 4.3      | Environment Audit: need for audit- audit types and benefits- environmental audit procedure  | CO5      | 2 |
| 4.4      | ISO 14001 standards: Importance, salient features - Stages in implementation- Benefits      | CO5      | 2 |
| <b>5</b> | <b>Module V: Total Lecture Hours- 7</b>   |          |   |
| 5.1      | EIA case studies (Indian)- a highway project  | CO1, CO4 | 2 |
| 5.2      | Hydro electric power plant, air port project  | CO1, CO4 | 3 |
| 5.3      | Quarry mining project, solid waste management project                                       | CO1, CO4 | 3 |



**Model Question Paper**

Reg No.:-----

Name:\_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY****SEVENTH SEMESTER B.TECH DEGREE EXAMINATION****Course Code: CET415****Course Name: ENVIRONMENTAL IMPACT ASSESSMENT**

Max. Marks: 100

Duration: 3

Hours

**Part A***(Answer all questions; each question carries 3 marks)*

1. Explain the need for EIA
2. Why environmental (protection) act, 1986 is called an umbrella act?
3. Discuss screening of projects
4. What is rapid EIA?
5. What is ad hoc method for impact assessment?
6. How to predict the impact of a proposed food industry on the water quality of a nearby river
7. Explain the benefits of an environmental audit
8. What is ISO 14001 standard?
9. What are the impacts of a highway project on local air quality
10. Discuss the environment monitoring program for a quarry mining industry.

**PART B***(Answer one full question from each module, each question carries 14 marks)***Module 1**

11. (a) Discuss environmental standards for water, air and noise (6 Marks)
- (b) Discuss evolution of EIA in India (8 Marks)

OR

12. (a) Discuss Air (Prevention & Control of Pollution) Act 1981 (5 Marks)
- (b) Explain salient features of EIA notification 2006 (9 Marks)

**Module 2**

13. (a) Discuss environmental clearance process in India (10 Marks)
- (b) What is Form-1 ? (4 Marks)

OR

14. (a) What is Initial Environmental Examination? (5 Marks)  
(b) Explain different types of EIA (9 Marks)

**Module 3**

15. (a) Discuss in detail EIA methodologies (10 Marks)  
(b) How can air quality modelling help in assessing the impact on air (4 Marks)

OR

16. (a) Explain the steps to assess the impacts on the ecological environment due to a project (7 Marks)  
(b) Explain the steps involved in assessment of impacts on the water environment.

**Module 4**

17. (a) What are the different types of Environmental Audit? (5 Marks)  
(b) Discuss the content of an environment management plan (9 marks)

OR

18. (a) Discuss the salient features of an Environmental Monitoring Plan (5 Marks)  
(b) Explain in detail the procedure for conducting an environmental audit (9 Marks)

**Module 5**

19. Explain environmental clearance procedure for an airport (14 Marks)  
OR  
20. Discuss how to assess the impacts of a hydro electric project (14 Marks)

Estd.



2014