

**University of Engineering and Technology, Taxila**  
Department of Civil Engineering

|                           |  |
|---------------------------|--|
| <b>Course Title:</b>      | Environmental Engineering-II (CE-401)  |
| <b>Pre-requisite(s):</b>  | <ol style="list-style-type: none"><li>1. Hydrology &amp; Water Resources</li><li>2. Fluid Mechanics-I</li><li>3. Fluid Mechanics-II</li><li>4. Environmental Engineering-I</li></ol>   |
| <b>Credit Hours:</b>      | 2 + 1  |
| <b>Contact Hours:</b>     | 2 + 3  |
| <b>Text Book(s):</b>      | <ol style="list-style-type: none"><li>1. Water Supply &amp; Sewerage by E.W Steel and McGhee 4th, 5th, 6th Edition (whichever available)</li><li>2. Introduction to Environmental Engineering Third Edition by Davis &amp; Cornwell, McGraw Hill</li><li>3. Environmental Engineering Laboratory, by Dr. Khurshid Ahmad</li></ol>  |
| <b>Reference Book(s):</b> | <ol style="list-style-type: none"><li>1. Waste Water Engineering, Treatment, disposal, Reuse by Metcalf and Eddy, 3rd Edition.</li><li>2. Environmental Assessment in Practice by D. Owen Harrop &amp; J. Ashley Nixon</li><li>3. Integrated Solid Waste Management by George Tchobanoglous, Hilary Theisen &amp; Samuel A. Vigil</li><li>4. Elements of public health engineering by K.N Duggal</li><li>5. Water and Waste water Engineering by Fair &amp; Gayer</li><li>6. Water and Wastewater Technology by Mark J, Hammer</li></ol> |

- Course Objectives:**
1. Provide an overview of key topics in environmental science and engineering
  2. Gain an understanding of the underlying scientific, engineering, and regulatory concepts in each topical area
  3. Learn several quantitative approaches for environmental assessment and problem solving
  4. To get understanding to solve environmental issues in field like sewer design, water supply design, solid waste management, preparation of EIA, management of air quality, noise control etc.

**Course Learning Objectives:**

At the end of this course, the student will:

- CLO:1 Be able to formulate and identify basic and complex environmental issues in the field of environmental engineering.
- CLO:2 Learn to design water supply and treatment systems, wastewater treatment and collection systems, solid waste collection and management systems.
- CLO:3 Also be able to communicate environmental issues and solutions through environmental assessment reports.

**Course Contents:**

- Introduction to Environmental Engineering & Sciences
- Water Treatment and Water Supply Networks
- Water and Wastewater Disinfection
- Water Treatment and Water Supply Networks
- Wastewater Collection And Treatment (Design Criteria)
- Water Supply Systems
- Water Supply and Distribution System (Design Criteria)
- Storm Water Drainage (Design Criteria)
- Planning and Design Criteria for Solid Waste Management System
- Water Quantity and Water Quality
- Microbial Quality of Drinking Water and the Risk of Waterborne Diseases
- Purification of Water
- Water Treatment Process & Supply
- Internal Water Supply and Sanitary Drainage Systems
- Sewerage & Sanitary Engineering

- Sewage Characteristics
- Environmental Impact Assessment (EIA)
- Solid Waste Engineering & Management

**Grading Policy:**

| <b>Sr. No.</b>     | <b>Grading</b>       | <b>% of Total Marks</b> |
|--------------------|----------------------|-------------------------|
| 1                  | Assignments          | 10                      |
| 2                  | Un-Announced Quizzes | 10                      |
| 3                  | Lab Work             | 10                      |
| 4                  | Subject Project      | 10                      |
| 5                  | Mid Term             | 20                      |
| 6                  | End Term             | 40                      |
| <b>Total Marks</b> |                      | <b>100</b>              |

**Student Learning Outcomes:**

To learn about basic environmental issues in developing and developed world

To design simple and complex water supply and wastewater collection systems along with water and wastewater treatment options.

To understand and design solid waste management systems

To understand the environmental management plan for different environmental issues

**Course Professional Outcome/Industrial Usage:**

The Engineers will be able to plan and execute a water supply and water treatment system, wastewater collection and treatment system, solid waste collection and management options for small town and metropolitans.

The graduates will be able to design and formulate complex environmental issues in the real life according to the local and international standards.

The students will also be able to prepare environmental study reports as well.

| <b>PLO's</b> \ <b>CLO's</b> | <b>CLO-1</b> | <b>CLO-2</b> | <b>CLO-3</b> |
|-----------------------------|--------------|--------------|--------------|
| <b>1</b>                    | ✓            | ✓            | ✓            |
| <b>2</b>                    | ✓            | ✓            |              |
| <b>3</b>                    | ✓            | ✓            | ✓            |
| <b>4</b>                    | ✓            |              | ✓            |
| <b>5</b>                    |              | ✓            |              |
| <b>6</b>                    |              |              | ✓            |
| <b>7</b>                    | ✓            | ✓            | ✓            |
| <b>8</b>                    | ✓            |              | ✓            |
| <b>9</b>                    | ✓            | ✓            | ✓            |
| <b>10</b>                   |              |              | ✓            |
| <b>11</b>                   |              |              | ✓            |
| <b>12</b>                   | ✓            | ✓            | ✓            |

| <b>Assign.</b> \ <b>CLO's</b> | <b>CLO-1</b> | <b>CLO-2</b> | <b>CLO-3</b> |
|-------------------------------|--------------|--------------|--------------|
| <b>Modules</b>                |              |              |              |
| Assignment                    | ✓            | ✓            | ✓            |
| Quizzes                       | ✓            |              |              |
| Midterm                       | ✓            | ✓            |              |
| Final Term                    | ✓            | ✓            |              |