

GE 302 Industry and the Environment

Department of Civil Engineering King Saud University

<p>Course Description: GE 302 Industry and the Environment (Required for the B.Sc. degree in Civil Engineering)</p>	<p>This course introduces the impact of engineering and industrial activities on the environment. The lectures cover basics of ecosystems, environmental balance, types of pollution, and types, sources, and limits of pollutants; in addition to fundamentals of Environmental Impact Assessment (EIA). Pollution control technologies and examples of pollution from various engineering and industrial sectors are also covered. The course also includes a group term project. 2(2,0,0)</p>
<p>Prerequisite</p>	<p>None</p>
<p>Course Learning Objectives</p>	<p>Students completing this course will be able to:</p> <ol style="list-style-type: none"> 1. Understand the basics of the global ecosystem and the natural cycles of its major components 2. Understand the types of environmental pollution caused by engineering and industrial activities 3. Realize the importance of sustainable development and maintaining environmental balance. 4. Understand the different types of pollutants, their sources, limits and the various technologies for pollution control. 5. Recognize the importance of EIA prior the development of the projects. 6. Improve their communication skills, including reading, writing, and oral presentations.
<p>Topics Covered</p>	<ol style="list-style-type: none"> 1. Introduction to the environment, ecosystems and environmental pollution (definition of some environmental terms, categories of pollutants, examples of different types of pollution, natural cycles of principal components). 2. Water pollution (water quality, water quantities, pollutants and their standard limits and treatment; wastewater quantity, characteristics, reuse and discharge standards, and treatment) 3. Air pollution (types of pollutants, standards, and control) 4. Solid wastes (quantity, characteristics, management, and disposal) 5. Noise pollution (introduction, rating systems, effects on people, sources, and control). 6. Fundamentals of environmental impact assessment.
<p>Class Schedule</p>	<p>Two 50-minute lecture sessions per week.</p>
<p>Computer Applications</p>	<p>Searching the internet for related topics is encouraged during the course and for facilitating the term project.</p>
<p>Project</p>	<p>A project is offered for the students in groups, to improve their understanding of environmental engineering systems and fundamentals as well as relevant contemporary issues (i.e. recycling of materials, global warming, green technologies, sustainable development and public health). Such project includes a collection of information and/or studying cases of pollution from industry, to emphasize the linkage between real cases of pollution and control with the course content. A written report and oral presentation are required.</p>
<p>Contribution of Course to Meeting the</p>	<ol style="list-style-type: none"> 1. Students develop awareness of environmental ethics and contemporary issues in their engineering profession

Professional Component	<ol style="list-style-type: none"> 2. Students understand potential impacts of engineering & industrial activities on the environment 3. Students improve their communication and presentation skills. 4. Students recognize the role of professional societies in developing standards and updating current knowledge.
Relationship of Course to Program Outcomes	<p>This course will allow students to:</p> <ol style="list-style-type: none"> 1. Students use knowledge of math, science & engineering in understanding environmental related issues (ABET a) 2. Students develop knowledge and awareness of contemporary environmental issues: for example, pollution and waste management, sustainable development, public health and environmental ethics (ABET j). 3. Students acquire broad education necessary to understand the impact of engineering solutions in a global, environmental and societal context (ABET h) 4. Students develop their ability to prepare written reports and oral presentations; hence improve their communication skills (ABET g).
Textbook(s) and Other Supported Material:	<ol style="list-style-type: none"> 1. G. Tyler Miller, Scott Spoolman (2014) Living in the Environment, 17th edition, Cengage Learning. (Chapter: 3, 6, & 23) 2. Jerry A. Nathanson, Richard A. Schneider (2014) Basic Environmental Technology: Water Supply, Waste Management, and Pollution Control, 6th edition, Pearson Education, Limited. (Chapter: 5, 11, 12, 13, & 14)

Grade Distribution

Two Mid-term Exams:	40%
Field visit	10% (3% attendance, 3% Report, 4% Quiz about the visit)
Project:	10% (5% report's content, 1% organization, 4% oral presentation)
Final Exam:	40%

Project Report

TERM PROJECT REPORT on relevant contemporary issues or other suitable topics must be submitted and **ORAL PRESENTATIONS** delivered by students at the specified times. Late submission will be penalized. Submissions must be neat and clean in A4 paper format. The report must include a table of contents, page numbers, structured sections and well-documented references. Report length is between **5 – 10 typewritten pages** (excluding appendices); the report should be presented in clean typescript (12 pitch and 1.5 line space) on A4 paper bounded appropriately. Oral presentations will be within 15 minutes each and will be judged based on content, clarity, time management, eye contact and attempt to use the English language.

Notes for Excused Absences

According to the university regulations, student absence times should not exceed 25% of lecture times, to attend the final exam. Excused absence notes; e.g. medical, should be submitted to the instructor within one week following the absence.