The Hong Kong University of Science and Technology

UG Course Syllabus

CENG 4710 Environmental Control

3 credits

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Course Description

- Recognize the necessity for managing the environment for sustainable development
- Understand that pollution prevention is the most important aspect of environmental control
- Learn to use appropriate measures for pollution prevention
- Learn to use appropriate methods for the control of emissions into the atmospheric environment
- Learn to use appropriate methods for the control of wastes emitted into the aquatic environment
- Learn to use appropriate methods for the control of solid wastes and hazardous wastes
- Become confident for an interview with an environmental consulting firm or EPDHK

Intended Learning Outcomes (ILOs)

Be able

1. to identify the available resources in the ecosystems
2. to identify the impact of human activities on the ecosystems
3. to identify **the need for prudent management of the ecosystems' resources** to attain sustainable development
4. to plan for pollution prevention as the first and foremost measure for environmental control
5. to **apply chemical engineering principles** in solving environmental problems
6. to identify the types and sources of solid wastes
7. to employ physical, chemical, catalytic, biological and thermal methods for the treatment of **solid wastes**
8. to use appropriate methods for the treatment of **hazardous wastes**
9. to identify the types and sources of pollutants emitted into the atmospheric environment
10. to employ physical, chemical, catalytic, thermal and biological methods for the treatment of **air emission**
11. to identify the types and sources of wastewater
12. to employ physical, chemical, catalytic and biological methods for the treatment of **wastewater**
13. to **perform a preliminary design** for the incineration of Municipal Solid Waste (MSW) in Hong Kong

Assessments:

Assessment Task	Contribution to Overall Course grade (%)
Assignments	20%
2 Quizzes	20%
Final Examination	60%

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
Assignments	ILO1, ILO2, ILO4, ILO5, and ILO8	Assignment will be allocated to the students for background data search on the environmental control. Identification of waste sources, engineering solutions, and treatment methodologies will be introduced to the students.
Quizzes	ILO3, ILO6, ILO9, and ILO11	Identification of waste sources and its treatments will be given in this assessed task to evaluate the students' ability on environmental concerns and their solutions to different kinds of wastes.
Final Examination	ILO7, ILO10, ILO12, and ILO13	Knowledge of designing aspects and treatment methods on air, water and solid contaminants will be evaluated.

Final Grade Descriptors:

Grades	Short Description	Elaboration on subject grading description
A	Excellent Performance	[Example: Demonstrates a comprehensive grasp of subject matter, expertise in problem-solving, and significant creativity in thinking. Exhibits a high capacity for scholarship and collaboration, going beyond core requirements to achieve learning goals.]
B	Good Performance	[Example: Shows good knowledge and understanding of the main subject matter, competence in problem-solving, and the ability to analyze and evaluate issues. Displays high motivation to learn and the ability to work effectively with others.]
C	Satisfactory Performance	[Example: Possesses adequate knowledge of core subject matter, competence in dealing with familiar problems, and some capacity for analysis and critical thinking. Shows persistence and effort to achieve broadly defined learning goals.]
D	Marginal Pass	[Example: Has threshold knowledge of core subject matter, potential to achieve key professional skills, and the ability to make basic judgments. Benefits from the course and has the potential to develop in the discipline.]
F	Fail	[Example: Demonstrates insufficient understanding of the subject matter and lacks the necessary problem-solving skills. Shows limited ability to think critically or analytically and exhibits minimal effort towards achieving learning goals. Does not meet

		the threshold requirements for professional practice or development in the discipline.]