

PROPOSED COURSE OUTLINE TEMPLATE FOR STUDENTS AT NTU

Academic Year	2020-2021	Semester	S1
Course Coordinator	Asst. Prof. Chong Tzyy Haur		
Course Code	CV3015		
Course Title	Environmental Engineering		
Pre-requisites	CV1012 – Fluid Mechanics		
No of AUs	3		
Contact Hours	Total: 39 hours (Lecture: 26 hours; Tutorial: 13 hours)		
Proposal Date	20-May 2020		

Course Aims

This course aims to provide you with an overview of general environmental engineering principles, which integrate science and engineering principles to improve the natural environment (air, water, and land resources), to provide healthy water, air and land for human habitation and for other organisms, and to remediate pollution sites. Environmental engineering is vital for our future as we need to protect the earth for those who live here tomorrow.

Intended Learning Outcomes (ILO)

By the end of this course, you (as a student) should be able to:

1. Calculate the water use and wastewater generation.
2. Explain basic water quality parameters and wastewater characteristics.
3. Discuss the working principle and design of unit processes for water treatment.
4. Discuss the working principle and design of unit processes for wastewater treatment.
5. Classify solid wastes and air quality; discuss solid waste management and the impacts of air pollution.

Course Content

Topic 1: Water Use
 Topic 2: Water Quality and Standard
 Topic 3: Water Treatment Processes
 Topic 4: Wastewater Generation and Characteristics
 Topic 5: Wastewater Treatment Processes
 Topic 6: Biological Treatment process
 Topic 7: Solid Waste Management
 Topic 8: Air Quality

Assessment (includes both continuous and summative assessment)

Component	Course LO Tested	Related Programme LO or Graduate Attributes	Weighting	Team/Individual	Assessment rubrics
1. Final Examination	1, 2, 3, 4, 5	CVE SLOs (2018) a, b, g	60%	Individual	Appendix 1
2. Continuous Assessment 1 (CA1): Quiz 1	1, 2, 3	CVE SLOs (2018) a, b, g	20%	Individual	Appendix 1
3. CA2: Quiz 2	4, 5	CVE SLOs (2018) a, b, g	20%	Individual	Appendix 1
Total			100%		

Formative feedback

For CA1 and CA2, the questions and solutions will be discussed with you after the quiz. You will be informed of the median grade and individual grade will be uploaded in NTULearn.

Learning and Teaching approach

Approach	How does this approach support students in achieving the learning outcomes?
e-learning	Video lessons provide an overview of the topics. You should complete the video lessons prior to attending the face-to-face lecture.
Lecture	Faculty will elaborate on complex content for deeper learning. You will be able to ask questions when in doubt.
Tutorial	Tutor will guide you in analysing and solving problems.

Reading and References

1. Hammer and Hammer, 'Water and Wastewater Technology', Pearson Prentice Hall, 7th Ed. 2012.

Course Policies and Student Responsibilities**(1) General**

You are expected to complete all assigned pre-class readings and activities, attend all lectures and tutorials punctually and take all quizzes. You are expected to take responsibility to follow up with course notes and course related announcements for lectures and tutorials you have missed. You are expected to participate in all lectures and tutorials discussions and activities.

(2) Absenteeism

CAs make up a significant portion of your course grade. Absence from quizzes without a

valid reason will affect your overall course grade. Valid reasons include falling sick supported by a medical certificate and participation in NTU's approved activities supported by an excuse letter from the relevant bodies. There will be no make-up opportunities for quizzes.

Academic Integrity

Good academic work depends on honesty and ethical behaviour. The quality of your work as a student relies on adhering to the principles of academic integrity and to the NTU Honour Code, a set of values shared by the whole university community. Truth, Trust and Justice are at the core of NTU's shared values.

As a student, it is important that you recognize your responsibilities in understanding and applying the principles of academic integrity in all the work you do at NTU. Not knowing what is involved in maintaining academic integrity does not excuse academic dishonesty. You need to actively equip yourself with strategies to avoid all forms of academic dishonesty, including plagiarism, academic fraud, collusion and cheating. If you are uncertain of the definitions of any of these terms, you should go to the [academic integrity website](#) for more information. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Course Instructors

Instructor	Office Location	Phone	Email
Asst. Prof. Chong Tzyy Haur	N1-01c-91	6513 8126	thchong@ntu.edu.sg
Assoc. Prof. Zhou Yan	N1-01c-90	6790 6103	zhouyan@ntu.edu.sg

Planned Weekly Schedule

Week	Topic	Course LO	Readings/ Activities
Week 1	Topic 1: Water Use	1	e-learning: 1 hour Lecture: 2 hours
Week 2	Topic 2: Water Quality and Standard	2	e-learning: 1 hour Lecture: 2 hours Tutorial: 1 hour
Week 3	Topic 3: Water Treatment Processes	3	e-learning: 1 hour Lecture: 2 hours Tutorial: 1 hour
Week 4	Topic 3: Water Treatment Processes	3	e-learning: 1 hour Lecture: 2 hours Tutorial: 1 hour
Week 5	Topic 3: Water Treatment Processes	3	e-learning: 1 hour Lecture: 2 hours Tutorial: 1 hour
Week 6	Topic 3: Water Treatment Processes Quiz 1	3	e-learning: 1 hour Lecture: 1 hour Tutorial: 1 hour Quiz: 1 hour

Week 7	Topic 4: Wastewater Generation and Characteristics	1, 2	e-learning: 1 hour Lecture: 2 hours Tutorial: 1 hour
Week 8	Topic 5: Wastewater Treatment Processes	4	Lecture: 2 hours Tutorial: 1 hour
Week 9	Topic 6: Biological Treatment process	4	Lecture: 2 hours Tutorial: 1 hour
Week 10	Topic 6: Biological Treatment process	4	Lecture: 2 hours Tutorial: 1 hour
Week 11	Topic 6: Biological Treatment process	4	Lecture: 2 hours Tutorial: 1 hour
Week 12	Topic 7: Solid Waste Management	5	Lecture: 2 hours Tutorial: 1 hour
Week 13	Topic 8: Air quality Quiz 2	5	Lecture: 2 hours Tutorial: 1 hour

Appendix 1: Assessment Criteria for Final Examination, CA1 and CA2

Performance criteria	Performance Level			
	Outstanding: 4	Good: 3	Average: 2	Poor: 1
Calculate the water use and wastewater generation.	Excellent knowledge of water use and wastewater generation	Good knowledge of water use and wastewater generation	General understanding of water use and wastewater generation	Little understanding of water use and wastewater generation
Explain basic water quality parameters and wastewater characteristics.	Excellent ability to analyse basic water quality parameters and wastewater characteristics.	Good ability to analyse basic water quality parameters and wastewater characteristics.	Able to analyse basic water quality parameters and wastewater characteristics.	Unable to analyse basic water quality parameters and wastewater characteristics.
Discuss the working principle and design of unit processes for water treatment.	Excellent ability to explain the working principle and design of the unit processes for water treatment.	Good ability to explain the working principle and design of the unit processes for water treatment.	Able to explain the working principle and design of the unit processes for water treatment.	Unable explain the working principle and design of the unit processes for water treatment.
Discuss the working principle and design of unit processes for wastewater treatment.	Excellent ability to explain the working principle and design of the unit processes for wastewater treatment.	Good ability to explain the working principle and design of the unit processes for wastewater treatment.	Able to explain the working principle and design of the unit processes for wastewater treatment.	Unable explain the working principle and design of the unit processes for wastewater treatment.
Classify solid wastes and air quality; discuss solid waste management and the impacts of air pollution.	Excellent understanding of solid waste management and the various adverse effects of air pollution.	Good understanding of solid waste management and the various adverse effects of air pollution.	General understanding of solid waste management and the various adverse effects of air pollution.	Little understanding of solid waste management and the various adverse effects of air pollution.