Annexe A: New/Revised Course Content in OBTL+ Format

Course Overview

The sections shown on this interface are based on the templates UG OBTL+ or PG OBTL+

If you are revising/duplicating an existing course and do not see the pre-filled contents you expect in the subsequent sections e.g. Course Aims, Intended Learning Outcomes etc. please refer to Data Transformation Status for more information.

Expected Implementation in Academic Year	
Semester/Trimester/Others (specify approx. Start/End date)	
Course Author * Faculty proposing/revising the course	Lee-Chua Lee Hong
Course Author Email	clhlee@ntu.edu.sg
Course Title	Water Supply Engineering
Course Code	EN2003
Academic Units	3
Contact Hours	39
Research Experience Components	Not Applicable

Course Requisites (if applicable)

Pre-requisites	CV1012 Fluid Mechanics
Co-requisites	
Pre-requisite to	
Mutually exclusive to	
Replacement course to	
Remarks (if any)	

Course Aims

This course aims to provide a sound understanding of design principles in water supply systems and treatment processes. You will be able to acquire sufficient knowledge on basic design of water supply systems, and conventional and advanced water treatment processes.

Course's Intended Learning Outcomes (ILOs)

Upon the successful completion of this course, you (student) would be able to:

ILO 1	Identify and analyse basic water storage and distribution systems
ILO 2	Apply conventional water treatment and design principles covering mixing, coagulation and flocculation
ILO 3	Analyse and design water treatment units covering sedimentation, filtration and disinfection
ILO 4	Analyse taste and odour problems and use activated carbon adsorption for odour control
ILO 5	Design basic iron and manganese removal, water softening and ion exchange units
ILO 6	Apply concepts of membrane technology in water supply engineering

Course Content

S/N	Topic
1.	Water storage and distribution systems, pipe networks
2.	Technology overview
3	Water treatment and design: mixing, coagulation and flocculation
3.	Water treatment and design: sedimentation, filtration and disinfection.
4.	Taste and odour control; use of activated carbon adsorption
5.	Iron and manganese removal, water softening and ion exchange
6.	Concepts of membrane technology.

Reading and References (if applicable)

Reference: Viesman, W.J. and Hammer, M.J., "Water Supply and Pollution Control", 8th edition, Pearson Prentice Hall, 2004.

Planned Schedule

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
1	Public water supply requirements; review of hydraulics fundamentals	1		In-person	Lecture and Tutorial
2	Distribution, storage and pumping systems; pipe network analysis.	1		In-person	Lecture and Tutorial
3	Water treatment technology overview and coagulation	2		In-person	Lecture and Tutorial
4	Coagulation and flocculation	2		In-person	Lecture and Tutorial
5	Mixing, flocculation, sedimentation	2		In-person	Lecture and Tutorial
6	Sedimentation	3		In-person	Lecture and Tutorial
7	Filtration	3		In-person	Lecture and Tutorial
8	Filtration	3		In-person	Lecture and Tutorial, Quiz
9	Softening and ion exchange	5		In-person	Lecture and Tutorial
10	Disinfection	3		In-person	Lecture and Tutorial

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
11	Odour/taste control, iron and manganese removal and adsorption	4, 5		In-person	Lecture and Tutorial
12	Adsorption and membrane technology	4, 6		In-person	Lectures, Tutorials and Quiz
13	Membrane technology	6		In-person	Lecture and Tutorial

Learning and Teaching Approach

Approach	How does this approach support you in achieving the learning outcomes?
Lecture	Formal lectures on the topics with examples
Tutorial	In depth discussion of tutorial problems with step-by-step solution process discussion.

Assessment Structure

Assessment Components (includes both continuous and summative assessment)

No.	Component	ILO	Related PLO or Accreditation	Weightage	Team/Individual	Rubrics	Level of Understanding
1	Summative Assessment (EXAM): Final exam(Final Examination)	1,2,3,4,5,6	ENE SLOs (a), (b), (c) and (I)	60	Individual	Holistic	Relational
2	Continuous Assessment (CA): Test/Quiz(2 Quizzes)	2,3,4,5	ENE SLOs (a), (b), (c) and (I)	40	Individual	Analytic	Multistructural

Description of Assessment Components (if applicable)

Formative Feedback

1. Feedback will be through dissemination of the student's performance in quizzes as well as review of the quiz questions in class. Follow-up consultation will be arranged as needed.   2. Besides having interactive discussion during tutorial, we encourage you to initiate individual consultation sessions on your particular learning needs

NTU Graduate Attributes/Competency Mapping

This course intends to develop the following graduate attributes and competencies (maximum 5 most relevant)

Attributes/Competency	Level
Care for Environment	Advanced
Care for Society	Basic
Creative Thinking	Basic
Decision Making	Basic
Problem Solving	Intermediate

Course Policy

Policy (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. On the use of technological tools (such as Generative AI tools), different courses / assignments have different intended learning outcomes. Students should refer to the specific assignment instructions on their use and requirements and/or consult your instructors on how you can use these tools to help your learning. Consult your instructor(s) if you need any clarification about the requirements of academic integrity in the course.

Policy (General)

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Policy (Absenteeism)

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Policy (Others, if applicable)

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