

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.

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|--|---|
| 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 | Integrated Design Project |
| Course Code | EN4912 |
| Academic Units | 3 |
| Contact Hours | 39 |
| Research Experience Components | Research Defined Course (at least 50% of deliverables involve practical research activities: problem identification, hypothesis forming, data collection/analysis/interpretation, result communication) |

Course Requisites (if applicable)

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|-----------------------|-----------------|
| Pre-requisites | Year 4 standing |
| Co-requisites | |
| Pre-requisite to | |
| Mutually exclusive to | |
| Replacement course to | |
| Remarks (if any) | |

Course Aims

The objective of this course is to give you an appreciation of the various aspects of designing environmental and civil engineering projects from conception to completion.

After successfully attending the course, you should be able to undertake basic practical design of environmental projects.

Course's Intended Learning Outcomes (ILOs)

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

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| ILO 1 | Identify the appropriate design factors and parameters when designing environmental and civil engineering projects. |
| ILO 2 | Apply design principles and methodologies when designing environmental and civil engineering projects. |
| ILO 3 | Propose cost effective designs which meet client requirements. |
| ILO 4 | Account for socio-economic and environmental sustainability in design. |
| ILO 5 | Effectively integrate different design components in environmental and civil engineering projects. |
| ILO 6 | Design projects that can be practically implemented. |

Course Content

| S/N | Topic |
|-----|---|
| 1. | Course overview and project briefing |
| 2. | Environmental impact assessment/Sustainable green design |
| 3. | Storm drainage infrastructure/Air, noise and ground pollution |
| 4. | Water resources management/Solid waste management |
| 5. | Water treatment and supply |
| 6. | Wastewater treatment/reclamation |

Reading and References (if applicable)

1. Linsley, R. K., Franzini, J.B., Freyberg, D.L., Tchobanoglous, G. (1992) "Water Resources Engineering", McGraw-Hill
2. Wanielista, M.P.(1993): "Stormwater Management: Quantity and Quality", Ann Arbor Science
3. Chow, V.T.; Maidment, D.R.; Mays, L.W. (1988): "Applied Hydrology", McGraw-Hill
4. Wanielista M. P., Kersten, R., Ealgin, R. (1997): "Hydrology: Water Quantity and Quality Control" John Wiley & Sons
5. Peavy, HS; Rowe, DR; Tchobanoglous, G (1987) "Environmental Engineering", International edition, McGraw-Hill Book Co.
6. McGhee, TJ (1991) "Water Supply and Sewerage". International edition, McGraw-Hill Book Co.

Planned Schedule

| Week or Session | Topics or Themes | ILO | Readings | Delivery Mode | Activities |
|-----------------|-------------------------------|---------------|------------------------|---------------|--|
| 1 | Course and Project Overview | 1, 4, 5, 6 | Read course ppt slides | In-person | Consultation with project instructor, Literature search of material for execution of design projects |
| 2 | Storm Drainage Design Part 1 | 1, 2 | Read course ppt slides | In-person | Consultation with project instructor, Literature search of material for execution of design projects |
| 3 | Storm Drainage Design Part 2 | 1, 2, 3, 4, 6 | Read course ppt slides | In-person | Consultation with project instructor, Literature search of material for execution of design projects |
| 4 | Water Resources Design Part 1 | 1, 2 | Read course ppt slides | In-person | Consultation with project instructor, Literature search of material for execution of design projects |

| Week or Session | Topics or Themes | ILO | Readings | Delivery Mode | Activities |
|-----------------|---|---------------|--|---------------|--|
| 5 | Water Resources Design Part 2 | 1, 2, 3, 4, 6 | Read course ppt slides | In-person | Consultation with project instructor, Literature search of material for execution of design projects |
| 6 | Water Treatment/Water Supply Design | 1, 2, 3, 4, 6 | Read course ppt slides | In-person | Consultation with project instructor, Literature search of material for execution of design projects |
| 7 | Green Design Concepts for Clean Tech Park | 4 | Read course ppt slides | In-person | Consultation with project instructor, Literature search of material for execution of design projects |
| 8 | Wastewater Treatment, Water Reclamation and Reuse | 1, 2 | Read course ppt slides Consultation with project instructor, Literature search of material for execution of design projects | In-person | Consultation with project instructor, Literature search of material for execution of design projects |

| Week or Session | Topics or Themes | ILO | Readings | Delivery Mode | Activities |
|-----------------|---|------------------|-----------------------------|---------------|--|
| 9 | Wastewater Treatment, Water Reclamation and Reuse | 1, 2, 3, 4, 5, 6 | Read course ppt slides | In-person | Consultation with project instructor, Literature search of material for execution of design projects |
| 10 | Wastewater Treatment, Water Reclamation and Reuse | 1, 2, 3, 4, 5, 6 | Read course ppt slides | In-person | Consultation with project instructor, Literature search of material for execution of design projects |
| 11 | Consultation | 2, 3, 6 | | In-person | Consultation with project instructor Literature search of material for execution of design projects |
| 12 | Consultation | 2, 3, 6 | | In-person | Consultation with project instructor Literature search of material for execution of design projects |
| 13 | Quiz | 1, 2, 5, 6 | Review of course ppt slides | In-person | |

Learning and Teaching Approach

| Approach | How does this approach support you in achieving the learning outcomes? |
|----------------------|---|
| Lectures | Formal lectures on principles related to the design projects |
| Consultations | To allow you to seek clarifications on the concepts taught during lectures and guidance in completing the design projects |
| Group Design Reports | You learn to work as a team to complete the design project reports which require self-study and research and team work beyond the lecture materials |

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 | Continuous Assessment (CA): Test/Quiz(Quiz) | 1,2,5,6 | ENE 2018 SLOs a, b | 30 | Individual | Analytic | Relational |
| 2 | Continuous Assessment (CA): Report/Case study(Group Project Reports) | 1,2,3,4,5,6 | ENE2018 SLOs a, b, c, d, f, g, i | 70 | Team | Holistic | Extended Abstract |

Description of Assessment Components (if applicable)

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Formative Feedback

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| <p>The quiz and project marks are announced to you.</p> <p>You are encouraged to meet Instructors to seek feedback on your project design reports.</p> |
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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 | Intermediate |
| Self-Management | Intermediate |
| Project Management | Advanced |
| Systems Thinking | 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)

(1) General

You are expected to complete all scheduled project assignments and reports by due dates. You are expected to take responsibility to follow up with course notes, consultations, and self-study to complete the assignments. You are expected to participate in all group project discussions and activities.

Policy (Absenteeism)

(2) Absenteeism

Group work requires each member to contribute to team work. 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.

Policy (Others, if applicable)

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