

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	AY2022-2023
Semester/Trimester/Others (specify approx. Start/End date)	Semester 1
Course Author * Faculty proposing/revising the course	Lee-Chua Lee Hong
Course Author Email	clhlee@ntu.edu.sg
Course Title	Environmental Impact Analysis & Monitoring
Course Code	EN4001
Academic Units	3
Contact Hours	39
Research Experience Components	Not Applicable

Course Requisites (if applicable)

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

Course Aims

This course aims to provide you with an understanding of the basic principles of an environmental impact assessment (EIA), the causes of impacts and the use of a formal EIA. You will be exposed to EIA concepts and methodologies relating to social, engineering, and economic issues. You will also learn to understand the purpose of monitoring and developing follow-up procedures as well as options for designing these procedures. After successfully attending the course, you should be able to prepare a simplified version of an Environmental Impact Statement or EIS.

Course's Intended Learning Outcomes (ILOs)

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

ILO 1	Explain the role of EIA in environmental management for sustainable development.
ILO 2	Identify the strengths and limitations of EIA.
ILO 3	Familiarise with various impact identification and analysis methods.
ILO 4	Undertake and prepare EIA studies and reports including monitoring and follow-up procedures.
ILO 5	Evaluate the technical and social economic impacts on the quality of the EIA reports.

Course Content

Environment systems; benefit and constraint of EIA, basic information on types and characteristics of impacts; EIA legislation, trends and application, EIA process including screening, scoping, preparation of EIA report, EIA review and follow-up, impact assessment and analysis; planning tools; assessment methodologies and indices; water, air, noise, social and economic impacts; management of impacts.

No	Topic	Lecture Hrs	Tutorial Hrs
1.	Background and introduction to Environmental Systems and the EIA process	3	
2.	EIA Legislation, Policy & Regulatory framework	2	
3.	Public Involvement	1	
4.	EIA Procedure: Screening & Scoping	3	
5.	EIA Methodologies & Impact Analysis	6	
6.	EIA Procedure: Mitigation & Impact Management including Monitoring & Auditing	4	
7.	EIA Procedure: Reporting & Review	2	
8.	EIA Procedure: Decision making, Implementation and Follow-up	2	
9.	Project Management	1	
10.	Introduction to Impact Assessment on environment component such as air, water and noise	10	
11.	Group Project Presentation: A simple attempt at an EIA project	5	
	Total	39	

Reading and References (if applicable)

1. Larry W. Canter, "Environmental Impact Assessment", 2nd edition, McGrawHill, 1996
2. Lohani, B., J.W. Evans, H. Ludwig, R.R. Everitt, Richard A. Carpenter, and S.L.Tu.
"Environmental Impact Assessment for Developing Countries in Asia", Volume 1 – Overview, 1997
3. United Nation University, UNEP, RMIT on-line EIA course module: http://eia.unu.edu/course/?page_id=173
4. United Nation Environment Programme: www.unep.ch/etb/publications/envImpAsse.php:
5. US EPA Clean Energy Program: www.epa.gov/cleanenergy
6. Singapore National Environmental Agency: www.nea.gov.sg

Planned Schedule

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
1	Background and introduction to Environmental systems and the EIA process	1, 2		In-person	Lectures
2	EIA Legislation, Policy & Regulatory framework. Public Involvement.	1, 2, 4, 5		In-person	Lectures
3	EIA Procedure: Screening & Scoping: EIA Methodologies & Impact Analysis; Mitigation & Impact Management; Reporting & Review; Decision making, implementation and follow-up.	1, 2, 3, 4, 5		In-person	Lectures
4	EIA Procedure: Screening & Scoping: EIA Methodologies & Impact Analysis; Mitigation & Impact Management; Reporting & Review; Decision making, implementation and follow-up.	1, 2, 3, 4, 5		In-person	Lectures

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
5	EIA Procedure: Screening & Scoping: EIA Methodologies & Impact Analysis; Mitigation & Impact Management; Reporting & Review; Decision making, implementation and follow-up.	1, 2, 3, 4, 5		In-person	Lectures
6	EIA Procedure: Screening & Scoping: EIA Methodologies & Impact Analysis; Mitigation & Impact Management; Reporting & Review; Decision making, implementation and follow-up.	1, 2, 3, 4, 5		In-person	Lectures

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
7	EIA Procedure: Screening & Scoping: EIA Methodologies & Impact Analysis; Mitigation & Impact Management; Reporting & Review; Decision making, implementation and follow-up.	1, 2, 3, 4, 5		In-person	Lectures
8	EIA Procedure: Screening & Scoping: EIA Methodologies & Impact Analysis; Mitigation & Impact Management; Reporting & Review; Decision making, implementation and follow-up.	1, 2, 3, 4, 5		In-person	Lectures
9	Project Management. Introduction to EIA on water, air and noise environment	2, 3, 4, 5		In-person	Lectures
10	Project Management. Introduction to EIA on water, air and noise environment	2, 3, 4, 5		In-person	Lectures

Week or Session	Topics or Themes	ILO	Readings	Delivery Mode	Activities
11	Project Management. Introduction to EIA on water, air and noise environment	2, 3, 4, 5		In-person	Lectures
12	Group Project Presentation: A simple attempt at an EIA project	1, 2, 3, 4, 5		In-person	Group Project Presentations
13	Group Project Presentation: A simple attempt at an EIA project	1, 2, 3, 4, 5		In-person	Group Project Presentations

Learning and Teaching Approach

Approach	How does this approach support you in achieving the learning outcomes?
Lecture	Formal lectures on topics with in-class discussions
Group Presentation	This helps to achieve one or more of the outcomes as they need to do self-study and research as well as promote team works.

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	EAB SLOs A, C, F, G, K	50	Individual	Holistic	Relational
2	Continuous Assessment (CA): Test/Quiz(Continuous Assessment 1 (CA1): Quiz)	1,2,3,4,5	EAB SLOs A, C, F, G, K	20	Individual	Analytic	Multistructural
3	Continuous Assessment (CA): Presentation(CA2: Group Project Presentation)	1,2,3,4,5	EAB SLOs E, F, G, H, I, J, K, L	30	Team	Analytic	Relational

Description of Assessment Components (if applicable)

Notes *: The group project assessment for this course is also reliant on you working closely as a team to complete the project. Besides, it also aims to train you to review the quality of others' group projects and to encourage active group participation. Hence, Group Rating Factor (GF) and Modification Factor (MF) will be applied to account for both the group and individual contributions to the group project work. The GF is derived from group evaluation submission while MF is derived from panel judges' feedback, weekly discussion session and peer assessment. For more details on the GF and MF calculations, please see Appendix 2 and 3, respectively.

*SLOs = Student Learning Outcomes for Environmental Engineering Programme (per BEng Environmental Engineering Accreditation)

Related Programme LO or Graduate Attributes

- A. Engineering knowledge: Apply the knowledge of mathematics, natural science, engineering fundamentals, and an engineering specialisation to the solution of complex engineering problems;
- B. Problem Analysis: Identify, formulate, research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences;
- C. Design/development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
- D. Investigation: Conduct investigations of complex problems using research-based knowledge and research

methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions

E. Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

F. The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal, and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

G. Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for the sustainable development.

H. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

I. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

J. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

K. Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and economic decision-making, and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

L. Life-long Learning: Recognise the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

Formative Feedback

The quiz questions will be discussed, and you will be able to view your quiz grade individually through Blackboard Grade Centre.

Comment on each group presentation will be given and each group will also submit comment with respect to other groups' presentations to the course instructor by email. The group presentation grade will be released through Blackboard Grade Centre.

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	Advanced
Collaboration	Advanced
Global Perspective	Advanced
Transdisciplinarity	Advanced

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)

Students are expected to take all scheduled assignments and tests by due dates. Students are expected to take responsibility to follow up with course notes, assignments and course related announcements. Students are expected to participate in all group project discussions and activities.

Policy (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. There will be no make-up opportunities for in-class activities.

Policy (Others, if applicable)

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