Faculty of Science and Technology

Bachelor of Engineering (Honours) in Environmental Engineering and Management

SEV 5411

Environmental Impact Assessment

Teaching and Learning Outline (Brief)

A. QF Level 5

B. Credit Values 3

C. Year 4

D. Pre-requisite (SEV4221 and SEV4231) or students from Civil Engineering and completed SCE5251

E. Co-requisite Nil

F. Module Aim(s)

It provides students with an overview on the principles, processes and methods in conducting environmental impact assessment (EIA) and environmental monitoring and audit (EM&A) for infrastructural and development projects. It addresses the relationship of EIA to socio-economic, environmental and ecological systems, and it positions EIA in the context of sustainable development.

G. Module Learning Outcomes

On completion of this Module, students are expected to be able to:

MLO1 conduct EIA studies in accordance with formal planning system and procedures with particular references to the Hong Kong's Environmental Impact Assessment Ordinance (Chapter 499) (EIAO) and the associated Technical Memorandum and Guidance Notes for the development projects in Hong Kong;

MLO2 evaluate possible alternatives in demand, activity, location, process and design, scheduling inputs, and "no project" based on the EIAO framework;

MLO3 assess baseline environmental conditions, identify potential environmental impacts, estimate impacts' magnitudes, evaluate impacts' significance and importance, and recommend possible mitigation measures and pollution abatement techniques;

MLO4 develop follow-up plan for monitoring, decommissioning and auditing in the completion and the operation stages of a project;

MLO5 function as a member of a team or as a team leader in conducting EIA by the use of assessment methods in the areas of air quality, noise, water quality, solid waste, traffic, sewerage, drainage, ecological impacts, and visual and landscape impacts.

H. Module Outline

The following topics/areas will be covered:

1. Origins and development of EIA, and basic principles
2. EIA Ordinance in Hong Kong and its legislation context
3. Starting up, baseline studies, and initial stages of a EIA study
4. Impact prediction, evaluation and mitigation in the areas of
    - Socio-economic
    - Social
    - Noise
    - Transport and traffic
    - Landscape and visual
    - Archaeological, heritage and cultural assets
    - Air quality and climate
    - Soils, geology and geomorphology
    - Water quality
    - Ecology - fauna and flora
    - Wetland, coastal ecology and geomorphology
5. Participation, presentation, and review
6. Sustainable development and sustainability appraisal
7. Monitoring and Auditing: after the decision marking

I. Curriculum Hours / Class Contact Hours

- Lecture : 28 hours
- Tutorial : 14 hours
- Work/Seminar : 10 hours

J. Teaching and Learning Strategies

- This is the first part of a capstone design project. Teaching takes the form of lectures and tutorials. Lecture classes are used to deliver formal material to a large group of students. In tutorial, students will be asked to discuss and share their experience in conducting their mini project's EIA study and research results.

- The module is developed with the aid of full scale simulated infrastructural projects in Hong Kong or abroad. All major teaching components and coursework will make reference to quasi-real (or simulated) projects with additional illustrative examples. Students are grouped in small team to conduct the EIA study of the simulated project. An EIA report (or EIS) will be completed at the end of the module which is followed by formal presentation. The Non-Technical Executive Summary of the EIS must be written in both Chinese and English.

- Workshops on computer modelling and simulation for impact analysis will be provided. Guest speakers will be invited to give presentations on latest EIA practice and issues in Hong Kong and abroad.

- *Industrial Tutors* invited from the industry will guide students for the professional

development of the EIA project.

- In additional, the chosen EIA study projects will be further developed by the student groups into design projects for sustainability (at preliminary/ operation/ completion stage). These design projects are carried forward to the final semester in the module entitled *Design of Environmental and Sustainable Facilities* and continue to develop the design projects to their final/detailed design stage.

K. Assessment Strategies and Measurement of MLOs

Assessment on students' abilities will be criteria-based and will enable students to demonstrate the achievements of the module learning outcomes (MLOs). The following abilities will be assessed through the project work. Two reports to be submitted include a formal EIA project study and a EM&A report.

MLO	Ability
1	• Define basic principle and processes of statutory requirement for EIA
2	• Formulate problems • Propose and evaluate possible alternatives
3	• Review and Evaluate baseline environmental conditions • Identify potential impacts and estimate impacts' magnitude • Evaluate impacts' importance and significance • Propose and evaluate mitigation measures and pollution abatement techniques • Develop a formal and professional EIA report
4	• Develop EIA follow-up plan by considering monitoring, decommissioning, and auditing scheme during the operation and completion of a project
5	• Function as a member of a team or a team leader • Apply modern engineering tools and use appropriate assessment methods in uncertain situations. • Apply computer software to analyse, design and prepare drawings

A summary of assessment methods is shown in the table below:

Module Learning Outcomes (MLOs)	Assessment Methods				Details of Assessment Methods
	PS	E	EM &A	PP	
1. conduct EIA studies in accordance with formal planning system and procedures with particular references to the Hong Kong's Environmental Impact Assessment (Chapter 499) (EIAO) and the associated Technical Memorandum and Guidance for the development projects in Hong Kong;	✓	✓		✓	- Progress Submission: define basic principle and processes of statutory requirement for EIA - EIA Report: develop a formal and professional EIA report - Formal Project Presentation
2. evaluate possible alternatives in demand, activity, location, process and design, scheduling inputs, and "no project" based on the EIAO framework;	✓	✓		✓	- Progress Submission: define basic principle and processes of statutory requirement for EIA - EIA Report: develop a formal and professional EIA report - Formal Project Presentation
3. assess baseline environmental conditions, identify potential environmental impacts estimate impacts' magnitudes, evaluate impacts' significance and importance, and recommend possible mitigation measures and pollution abatement techniques;		✓		✓	- EIA Report: develop a formal and professional EIA report - Formal Project Presentation
4. develop follow-up plan for monitoring, decommissioning and auditing in the completion and the operation stages of a project;			✓	✓	- EM&A Report: develop EIA follow-up plan by considering monitoring, decommissioning, and auditing scheme during the operation and completion of a project - Formal Project Presentation
5. function as a member of a team or as a team leader in conducting EIA by the use of assessment methods in the areas of air quality, noise, water quality, solid waste, traffic, sewerage, drainage, ecological impacts, and visual and landscape impacts.	✓	✓	✓	✓	- Progress Submission: define basic principle and processes of statutory requirement for EIA - EIA Report: develop a formal and professional EIA report - EM&A Report: develop EIA follow-up plan by considering monitoring, decommissioning, and auditing scheme during the operation and completion of a project - Formal Project Presentation

Legends: PS – Progress submission
E – EIA report
EM&A – EM&A report
PP – Formal project presentation

The percentage contributions to the overall module assessment are:-

- Quiz : 15%
- Progress Submission : 10%
- EIA Report : 40%
- EM&A Report : 15%

- Formal Project Presentation : 20%

L. Reading List

Textbooks:

1. GLASSON, J., THERIVEL, R. and CHADWICK, A. (2005) *Introduction to Environmental Impact Assessment, 3rd ed*. London: Routledge Publisher.

2. MORRIS, P. and THERIVEL, R. (eds.) (2009) *Methods of Environmental Impact Assessment, 3rd ed.* London: Routledge Publisher.

References:

3. CARROLL, B., ENFUSION and TURPIN, T. (2002) *Environmental Impact Assessment Handbook: A Practical Guide for Planner, Developers and Communities*. London: Thomas Telford Ltd.

4. DETR and The National Assembly for Wales (2000) *Environmental Impact Assessment: A Guide to procedures.* London: Thomas Telford Ltd

5. Environmental Protection Department. (1989) *Environmental Impact Assessment Ordinance (Chapter 499)*. The Government of HKSAR.

6. LAWRENCE, D.P. (2003) *Environmental Impact Assessment: Practical Solutions to Recurrent Problems.* New Jersey: John Wiley & Sons, Ltd.

7. MARRIOTT, B. (1997) *Environmental Impact Assessment: A Practical Guide.* New York: McGraw-Hill, Ltd.

8. MORGAN, R.K. (1998) *Environmental Impact Assessment.* Springer.

9. ORTOLANO, L. (1997) *Environmental Regulation and Impact Assessment.* New Jersey: John Wiley & Sons, Ltd.

10. PETTS, J. (ed.) (1999) *Handbook of Environmental Impact Assessment, Volume I and Volume II*. New Jersey: John Wiley & Sons, Ltd.

11. THERIVEL, R. (2005) *Strategic Environmental Assessment in Action*. London: Earthscan - Taylor & Francis Group.

12. WOOD, C. (2002) *Environmental Impact Assessment: A Comparative Review, 2nd ed*. New Jersey: Pearson Prentice Hall.

Research Journals:

13. Natural Hazards Review

14. Journal of Environmental Quality

15. Environment

16. Review of Environmental Economics and Policy
17. Environmental Reviews
18. Building and Environment
19. Environmental Impact Assessment Review
20. Environment, Development and Sustainability
21. Journal of Environmental Planning and Management
22. Environment and Development Economics
23. Environmental Engineering and Management Journal
24. Journal of Urban and Environmental Engineering (JUEE)
25. Journal of Environmental Management
26. Environmental Management
27. Journal of Environment & Development (JED)
28. International Journal of Environmental Studies
29. Journal of Environmental Assessment Policy and Management (JEAPM)
30. International Journal of Global Environmental Issues (IJGEnvI)
31. Journal of Environmental Economics and Management