COURSE DETAILS

Units of Credit 6
Contact hours 4 hours per week
Class
Tuesdays, 12:00 – 14:00 Colombo Theatre A
Tuesdays, 14:00 – 16:00 Tyree Energy Technology G16
Tuesdays, 14:00 – 16:00 CVEN Design Studio

Course Coordinator and Lecturer
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INFORMATION ABOUT THE COURSE

There are no pre-requisites for this course. It is a required course in the specialisation Environmental Engineering for the coursework masters degrees of MEngSc (8338), listed under the course group “Advanced Specialisation Disciplinary Knowledge”. It is recommended that it is taken as one of the Year 2 Environmental Engineering courses in the ME (Environmental Engineering CVENLT8621) program.

The course is compatible with, and complementary to other environmental engineering courses such as CVEN9892 Sustainability Assessment.

HANDBOOK DESCRIPTION

Spectrum of modern environmentalism and sustainable development; environmental impact statement techniques and EIA procedures; environmental management systems; tools for the analysis and management of environmental impacts of engineering projects, including environmental risk assessment, Life Cycle Assessment and other materials accounting techniques.


OBJECTIVES

Provide an introduction to Ecologically Sustainable Development (ESD) principles and investigate how ESD is operationalised through the use of tools such as Life Cycle Assessment, Ecological Footprint and Material Flux Analysis. Provide details of frameworks such as Environmental Impact Assessments (EIA) and Environmental Management Systems (EMS) and how they are applied in the context of new projects, corporations and regions.

List of course attributes:

- An in-depth engagement with the relevant disciplinary knowledge in its inter-disciplinary context
- Capacity for analytical and critical thinking and for creative problem solving
- Ability to engage independent and reflective learning
- Skills for collaborative, multi-disciplinary work and effective communication
TEACHING STRATEGIES

The internal version of this course is one session, 4 hours per week; nominally 2 hours lectures and 2 hours workshops. The subject lecturer anticipates that students will need to spend on average 10 hours per week in total to gain a satisfactory understanding of the course.

Students should use the approach that best suits them. In general I suggest come (see in Echo on line for distance students) to the lecture with the .ppt slides open in “Notes Page” View on your laptop/iPad etc.; write in notes in the lower section as the content is described, as there will be many diagrams and tables without any supporting text – you need to add this in from the lecturer’s commentary. If you do not understand a section of the lecture, then go to the Echo recording and review this component. Then, go to the Guided Learning Unit for the module/week and the associated readings and selectively read through them to cover the material you do not understand, or to complement what has been provided in the lecture.

Private Study

- Review lecture material and Moodle readings.
- Do problems set in lectures and workshops
- Distance students to participate in Moodle discussions of problems; internal student to observe these discussions.
- Reflect feedback on class problems and assignments
- Keep up with notices and find out marks via Moodle
- Active participation in OpenLearning

Lectures

- Find out what you must learn
- Follow worked examples
- Hear announcements on course changes

Workshops

- Practice solving set problems
- Ask questions

Assessments (quizzes, examination, assignment, on-line discussion for distance students)

- Demonstrate your knowledge and skills
- Demonstrate higher understanding and problem solving

EXPECTED LEARNING OUTCOMES

After successfully completing this course, you should be able to:

<table>
<thead>
<tr>
<th>Learning Outcome</th>
<th>EA Stage 1 Competencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Provide a definition of Environmental Management from a material perspective and identify sources of information which can be used to evaluate the progress towards Ecologically Sustainable Development</td>
<td>PE1.1, PE1.6, PE2.2, PE3.4, PE3.6</td>
</tr>
<tr>
<td>2. Apply environmental material accounting tools successfully and quantify the environmental impacts of the issue at hand depending on the context</td>
<td>PE1.1, PE1.6, PE2.2, PE3.4</td>
</tr>
<tr>
<td>3. Describe the components of an Environmental Impact Assessment (EIS) for a new project, and an Environmental Management System (EMS) for an operating facility and how these lead to the content of an annual Public Environmental Report.</td>
<td>PE1.1, PE1.6, PE2.2, PE3.4</td>
</tr>
</tbody>
</table>

COURSE PROGRAM

Refer to Moodle for the topics and a list of readings for each weekly topic.

A discussion forum for distance students, with a number of nominated students to upload text each week is provided in Moodle. Other distance students should privately write down their comments, and then check them against the nominated students and the lecturer’s summation. Internal students should only privately write down comments, and similarly compare them to the summation.
<table>
<thead>
<tr>
<th>Week</th>
<th>Lecturer</th>
<th>Topic</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Alvarez Gaitan</td>
<td>Subject overview, introduction to ESD, briefing on Assignments, Open Learning, Overview of Environmental Material Accounting</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Alvarez Gaitan</td>
<td>Ecological Footprints</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Alvarez Gaitan</td>
<td>Life Cycle Assessment</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Alvarez Gaitan</td>
<td>The Circular Economy</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Fisher</td>
<td>National Material Accounts</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>NO CLASS</td>
<td>NO CLASS</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Fisher</td>
<td>Material Flux Analysis</td>
<td></td>
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<tr>
<td>8</td>
<td>Fisher</td>
<td>MIPS</td>
<td></td>
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<tr>
<td>9</td>
<td>Fisher</td>
<td>Environmental Impact Statements</td>
<td></td>
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<tr>
<td>10</td>
<td>Fisher</td>
<td>Environmental Management Systems and Reports</td>
<td></td>
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</tbody>
</table>

**ASSESSMENT**

<table>
<thead>
<tr>
<th>Item</th>
<th>Length</th>
<th>Weighting</th>
<th>Learning outcomes assessed</th>
<th>Due date</th>
<th>Deadline for absolute fail</th>
<th>Marks returned</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.- EF Assignment</td>
<td>15 pages</td>
<td>30%</td>
<td>LO1, LO2</td>
<td>Jul 14th 2019</td>
<td>Same day</td>
<td>Jul 28th 2019</td>
</tr>
<tr>
<td>2.- Online weekly quizzes</td>
<td>10 min</td>
<td>20%</td>
<td>LO1, LO2, LO3</td>
<td>During lectures</td>
<td>Same day</td>
<td>Online</td>
</tr>
<tr>
<td>3.- Final Exam</td>
<td>TBD</td>
<td>20%</td>
<td>LO1, LO2, LO3</td>
<td>See Moodle</td>
<td>Within a week</td>
<td>One Week after</td>
</tr>
<tr>
<td>4.- Participation in forums</td>
<td>120 min</td>
<td>50%</td>
<td>LO1, LO2, LO3</td>
<td>TBC</td>
<td>TBC</td>
<td>1 week after</td>
</tr>
</tbody>
</table>

The final grade for this course will normally be based on the sum of the scores from each of the assessment tasks. The Final Examination is worth 50% of the Final Mark if class work is included and 100% if class work is not included. The class work is worth 50% of the Final Mark if included. The formal exam scripts will not be returned. Students who perform poorly in the quick quizzes and workshops are recommended to discuss progress with the Lecturer during the term.

**Final Examination**

The exam will be a 2-hour closed book exam during the normal exam period. You are NOT allowed to bring any documents into the examination room. The questions will generally be similar to the shorter questions specified in Moodle Discussion Forum from the Guided Learning Unit Exercises, and workshops. There are no previous exam papers available. Calculators allowed are described at:

https://student.unsw.edu.au/exams

The Exam date is set by Exams Branch, and is confirmed in about Week 10 of session. You can access the time and date of the exam via your MyUNSW.

All students are expected to sit their final examination at the UNSW Kensington campus. For more information on exams such as approval guidelines to sit the final examination via distance (if required), please see the link below:

TERM 2, 2019
All Distance/Short course mode students are expected to sit their final examination on Kensington campus (Sydney). If you reside further than 40 Km from the Kensington campus, and you wish to sit your exam externally (by distance), you must register for an external exam by the UNIVERSITY CENSUS DATE (Jun 30th) more information found [here](http://www.engineering.unsw.edu.au/civil-engineering/resources/exam).

Supplementary Examinations for Trimester 2 2019 will be held on Monday 9th – Friday 13th September (inclusive) should you be required to sit one. You are required to be available during these dates. Do not make arrangements during this time.

You should consider your progress on Jun 30th and if poor, should withdraw without failure, or have a discussion with the lecturer prior to the Census Date (Jun 30th).

Late work will be penalised at the rate of 10% per day after the due time and date have expired. If you are ill or have some misadventure, you need to apply for an extension for the assignment before the due time and date, and will need to support this with a Special Consideration form. Special consideration forms are at: [https://student.unsw.edu.au/special-consideration](https://student.unsw.edu.au/special-consideration)

### RELEVANT RESOURCES

There are no texts set for this subject. Coursenotes via .pdf files are provided for this course in Moodle and OpenLearning.

### UNSW Library

Many of our journals and books are e-versions. Go to [https://www.library.unsw.edu.au/](https://www.library.unsw.edu.au/)

External (off campus) service for UNSW students

UNSW Library aims to assist off-campus students and staff to obtain resources in a timely manner. The Library’s Document Services Unit supplies physical resources from the UNSW Library collections and will request resources not held from other suppliers. The library pays the forward mailing charges for materials requested. Off campus patrons are responsible for return postage costs and provision of a padded postage bag, to ensure the items are not damaged in transit.

Note: Due to limited loan periods and often lengthy delays in supplying physical resources, the library generally does not borrow books from overseas libraries for off-campus students and staff. For similar reasons, for off-campus students based overseas, generally only UNSW Library books will be provided. Copy requests are not affected.

All new Library external (off campus) service users need to register by completing the on-line registration form: [http://unsw.custhelp.com/app/offcampus/](http://unsw.custhelp.com/app/offcampus/)

Once registered, you can locate library items using UNSW ‘Library Search’ and request the resource via Library’s Interlibrary loan service request forms (ILL) which are visible when you login with your zid/zpassword to your ‘MyLibrary’. Refer to the Interlibrary Loan Service web page for more information on returning and renewing loans.

Off-campus students can:

- Contact the library whenever you need assistance with resources or services. Make an online enquiry; Visit the Help Zone; or Phone the Kensington Main Library: (02) 9385 2650
- Access the Library’s online resources from home using UNSW zid/zpasswords. Check your hardware and software meets library requirements: [https://library.unsw.edu.au/HowDoI/techhelp.html](https://library.unsw.edu.au/HowDoI/techhelp.html)
- Join the [University Library Australia & New Zealand (ULANZ)](https://www.library.unsw.edu.au/HowDoI/techhelp.html) borrowing scheme to borrow books from more conveniently located academic libraries.
• Use a range of Library search tools including finding journals. Learn more about finding DATABASES. Learn about searching effectively on UNSW ‘Library search’ tool by clicking the HELP above the search box.

• Refresh information skills, learn how to find, evaluate and use academic peer reviewed information by working through the online exercise: ELISE. This is particularly relevant if you are new to study or have not studied for some time.

• Learn more about using UNSW Library by viewing video clips especially, ‘Smart searching with UNSW Library’

Referencing your work

Use the how to guide https://student.unsw.edu.au/support-referencing-assignments

DATES TO NOTE

Refer to MyUNSW for Important Dates available at:

https://my.unsw.edu.au/student/resources/KeyDates.html

PLAGIARISM

Beware! An assignment that includes plagiarised material will receive a 0% Fail, and students who plagiarise may fail the course. Students who plagiarise are also liable to disciplinary action, including exclusion from enrolment.

Plagiarism is the use of another person’s work or ideas as if they were your own. When it is necessary or desirable to use other people’s material you should adequately acknowledge whose words or ideas they are and where you found them (giving the complete reference details, including page number(s)). The Learning Centre provides further information on what constitutes Plagiarism at:

https://student.unsw.edu.au/plagiarism

ACADEMIC ADVICE

Refer to Academic Advice on the School website available at:

https://www.engineering.unsw.edu.au/civil-engineering/student-resources/policies-procedures-and-forms/academic-advice
### Program Intended Learning Outcomes

<table>
<thead>
<tr>
<th>PE1: Knowledge and Skill Base</th>
<th>PE1.1 Comprehensive, theory-based understanding of underpinning fundamentals</th>
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<tbody>
<tr>
<td></td>
<td>PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing</td>
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<td></td>
<td>PE1.3 In-depth understanding of specialist bodies of knowledge</td>
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<td>PE1.4 Discernment of knowledge development and research directions</td>
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<td></td>
<td>PE1.5 Knowledge of engineering design practice</td>
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<td></td>
<td>PE1.6 Understanding of scope, principles, norms, accountabilities of sustainable engineering practice</td>
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<tr>
<td>PE2: Engineering Application Ability</td>
<td>PE2.1 Application of established engineering methods to complex problem solving</td>
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<td></td>
<td>PE2.2 Fluent application of engineering techniques, tools and resources</td>
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<td>PE2.3 Application of systematic engineering synthesis and design processes</td>
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<td></td>
<td>PE2.4 Application of systematic approaches to the conduct and management of engineering projects</td>
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<tr>
<td>PE3: Professional and Personal Attributes</td>
<td>PE3.1 Ethical conduct and professional accountability</td>
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<td>PE3.2 Effective oral and written communication (professional and lay domains)</td>
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<td>PE3.3 Creative, innovative and pro-active demeanour</td>
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<td>PE3.4 Professional use and management of information</td>
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<td></td>
<td>PE3.5 Orderly management of self, and professional conduct</td>
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<td></td>
<td>PE3.6 Effective team membership and team leadership</td>
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