



UNSW Course Outline

ENGG3001 Fundamentals of Humanitarian Engineering - 2024

Published on the 27 May 2024

General Course Information

Course Code : ENGG3001

Year : 2024

Term : Term 2

Teaching Period : T2

Is a multi-term course? : No

Faculty : Faculty of Engineering

Academic Unit : School of Civil and Environmental Engineering

Delivery Mode : In Person

Delivery Format : Standard

Delivery Location : Kensington

Campus : Sydney

Study Level : Undergraduate

Units of Credit : 6

Useful Links

[Handbook Class Timetable](#)

Course Details & Outcomes

Course Description

This course enables engineers to analyse and design infrastructure and appropriate technology to support the well-being and welfare of individuals and communities in disadvantaged circumstances. This includes developing countries as well as marginalised or remote

communities in Australia. The course provides students with frameworks to analyse and respond to complex multi-disciplinary engineering problems. The concept of appropriate technology and capacity building are fundamental to this course. It provides context to the planning and design of infrastructure and technology in areas such as water and waste management, energy supply and distribution, assistive technologies; and provides a series of case studies to illustrate humanitarian engineering principles.

Course Aims

This course enables engineers to analyse and design infrastructure and appropriate technology to support the well-being and welfare of individuals and communities in disadvantaged circumstances. At the end of the course, students will have developed:

- An understanding of humanitarian engineering, development and humanitarian action
- Skills for collaborative and multi-disciplinary work
- A respect for ethical practice and social responsibility
- Skills for effective communication
- Capacity for analytical and critical thinking and for creative problem solving
- Ability to engage independent and reflective learning

Relationship to Other Courses

ENGG3001 is a prerequisite for ENGG4102 and ENGG4103.

Course Learning Outcomes

Course Learning Outcomes
CLO1 : Demonstrate understanding of the principles of Humanitarian Engineering
CLO2 : Differentiate the design considerations in Humanitarian Engineering contexts compared to traditional engineering projects
CLO3 : Evaluate the success of humanitarian engineering projects
CLO4 : Reflect on the skills and attributes required to work in humanitarian engineering contexts
CLO5 : Communicate effectively through an oral presentation
CLO6 : Reflect on the need for cultural sensitivity and ethical behaviour in humanitarian engineering projects

Course Learning Outcomes	Assessment Item
CLO1 : Demonstrate understanding of the principles of Humanitarian Engineering	<ul style="list-style-type: none"> • Project Report and Poster • Humanitarian Engineering Reflection • Simulation
CLO2 : Differentiate the design considerations in Humanitarian Engineering contexts compared to traditional engineering projects	<ul style="list-style-type: none"> • Project Report and Poster
CLO3 : Evaluate the success of humanitarian engineering projects	<ul style="list-style-type: none"> • Project Report and Poster
CLO4 : Reflect on the skills and attributes required to work in humanitarian engineering contexts	<ul style="list-style-type: none"> • Humanitarian Engineering Reflection
CLO5 : Communicate effectively through an oral presentation	<ul style="list-style-type: none"> • Presentations
CLO6 : Reflect on the need for cultural sensitivity and ethical behaviour in humanitarian engineering projects	<ul style="list-style-type: none"> • Simulation • Humanitarian Engineering Reflection

Learning and Teaching Technologies

Moodle - Learning Management System

Learning and Teaching in this course

The course is based around a series of lectures highlighting a range of different fields of engineering where humanitarian engineering projects have been undertaken, including challenges and problems that need to be addressed, successful approaches and community engagement.

Workshops will promote group work as well as a cross-cultural problem solving and group presentations. Students would work in interdisciplinary teams where possible to maximise the learning outcomes.

Other Professional Outcomes

Program Intended Learning Outcomes PE1: Knowledge and Skill Base PE1.1

Comprehensive, theory-based understanding of underpinning fundamentals PE1.2 Conceptual understanding of underpinning maths, analysis, statistics, computing PE1.3 In-depth understanding of specialist bodies of knowledge PE1.4 Discernment of knowledge development and research directions PE1.5 Knowledge of engineering design practice PE1.6

Understanding of scope, principles, norms, accountabilities of sustainable engineering practice
PE2: Engineering Application Ability PE2.1 Application of established engineering methods to complex problem solving PE2.2 Fluent application of engineering techniques, tools and resources PE2.3 Application of systematic engineering synthesis and design processes PE2.4 Application of systematic approaches to the conduct and management of engineering projects PE3: Professional and Personal Attributes PE3.1 Ethical conduct and professional accountability PE3.2 Effective oral and written communication (professional and lay domains) PE3.3 Creative, innovative and pro-active demeanour PE3.4 Professional use and management of information PE3.5 Orderly management of self, and professional conduct PE3.6 Effective team membership and team leadership

Assessments

Assessment Structure

Assessment Item	Weight	Relevant Dates
Presentations	20%	Due Date: 05/06/2024 05:00 PM
Project Report and Poster	50%	Due Date: 25/07/2024 05:00 PM
Humanitarian Engineering Reflection	20%	Due Date: 09/08/2024 05:00 PM
Simulation	10%	

Assessment Details

Presentations

Assessment Overview

Presentations will be assessed on content and communication style including technical information, clarity of speech, clarity and usefulness of visual aids

Course Learning Outcomes

- CL05 : Communicate effectively through an oral presentation

Submission notes

Slides are due 17:00 Wednesday 5th June (Week 2) via Turnitin submission on Moodle. Ignite presentations occur in Workshops of Week 2 and Week 3 and you will present in your workshop on one of these weeks. Your Demonstrator will announce the week you will be delivering on Thursday in Week 2.

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Project Report and Poster

Assessment Overview

The report will be assessed based on the thoroughness of the project analysis and research, professional report standard and demonstration of a community centred approach. The poster will be presented in a Research Showcase and assessed by student peers and academics.

Course Learning Outcomes

- CLO1 : Demonstrate understanding of the principles of Humanitarian Engineering
- CLO2 : Differentiate the design considerations in Humanitarian Engineering contexts compared to traditional engineering projects
- CLO3 : Evaluate the success of humanitarian engineering projects

Detailed Assessment Description

See assignment sheet on Moodle. This assessment includes a teamwork evaluation grading component. i.e. team members rate each others input and an individual grade is awarded. This is undertaken by all team members on final submission of the assignment.

Assessment Length

25-30 pages

Submission notes

Poster to be printed and presented at Research Showcase on Wednesday 19th July. Report as well as Poster file to be uploaded on Moodle as per detailed instructions on Moodle by 17:00 Friday 21st July.

Assessment information

Content

See assignment sheet on course Moodle Page for full details on this assessment item for topic selection, group work approach and submission (poster prntng/showing at Research Showcase, report submission process inluding peer assessment)

Report: The report should address the following points:

- a history of the project/technology beginnings
- the rationale and main stakeholders

- the project/technology design and planning process, including community participation
- the implementation model and sources of finance
- existing capacity and capacity-building activities
- standards and quality assurance
- impacts and outcomes assessment of the long-term viability of the project/technology
- recommendations on how the project/technology could be improved
- contribution of the project/technology to humanitarian engineering, i.e. lessons learnt

Note that these factors do not necessarily need to be used as the headings/chapters for the report if there is a more logical way of presenting the project and students are encouraged to use a structure tailored to their findings. Appropriate references should be included in the report (Harvard style). As a guide, your report should be 25-30 pages including figures and bibliography.

Poster: Please prepare your poster in A1 paper size for printing and hanging on the wall in the Research Showcase. When developing your poster you might like to draw on the following tips:

- Get your message across with visual displays and small blocks of supporting text. Think of your poster as an illustrated abstract.
- Tell readers why your work matters, what you did, what you found, and what you recommend.
- Avoid excessive focus on methods - it's the results and implications that count!
- Overall appearance, use a pleasing arrangement of graphics, text, colours. Your poster should be neat and uncluttered - use white space to help organise sections. Balance the placement of text and figures.
- Organisation, use the headings to help readers find what they're looking for: Context, objective, impact, conclusions, etc. A columnar format helps traffic flow in a crowded poster session.
- Minimize text - use graphics. Keep text in blocks of no more than 50-75 words - don't create large, monolithic paragraphs of prose, maintain enough 'empty space' to allow an ease of viewing and intake of message.
- Use colour cautiously. Dark letters on light background are easiest to read. Stick to a theme of 2-3 colours. Avoid overly bright colours.
- Don't fight reader gravity, which pulls the eyes from top to bottom (first), and left to right.
- Prepare a verbal explanation. Colleagues may ask you to "walk them through" your poster. In making such a presentation, avoid reading the poster. Instead, give the big picture, explain why the problem is important, and use the graphics on your poster to illustrate and support your findings and recommendations.

Humanitarian Engineering Reflection

Assessment Overview

Part 1 - Provide a reflection on how your understanding has changed of the importance of geography and politics and their interactions with engineering and specifically Humanitarian Engineering.

Part 2 - Provide a reflection on the skills and opportunities that need to be identified and achieved in order to have a successful career as a humanitarian engineer.

Course Learning Outcomes

- CLO1 : Demonstrate understanding of the principles of Humanitarian Engineering
- CLO4 : Reflect on the skills and attributes required to work in humanitarian engineering contexts
- CLO6 : Reflect on the need for cultural sensitivity and ethical behaviour in humanitarian engineering projects

Detailed Assessment Description

Worth 30% not 20%. See assignment sheet on Moodle for details on assessment.

Assessment Length

2000 words

Submission notes

To be submitted via Turnitin in Moodle

Assessment information

To learn more about reflection essays visit <https://student.unsw.edu.au/reflective-writing>

Assignment submission Turnitin type

This assignment is submitted through Turnitin and students do not see Turnitin similarity reports.

Simulation

Assessment Overview

Participatory simulation activity exploring the roles of engineers, politicians and the community in development projects. Assessment will be based on contribution, engagement and awareness of the concepts encountered in lectures to date.

Course Learning Outcomes

- CLO1 : Demonstrate understanding of the principles of Humanitarian Engineering
- CLO6 : Reflect on the need for cultural sensitivity and ethical behaviour in humanitarian engineering projects

Detailed Assessment Description

No longer an assessment item. Worth 0% of grade.

General Assessment Information

All assignments must use harvard in-text citation and bibliography referencing system - see <https://www.student.unsw.edu.au/harvard-referencing>.

Grading Basis

Standard

Requirements to pass course

Overall grade of 50% or above.

Course Schedule

Teaching Week/Module	Activity Type	Content
Week 1 : 27 May - 2 June	Lecture	Lecture 1 - Introduction to Humanitarian Engineering and ENGG3001
	Lecture	Lecture 2 - Geopolitics and History
	Workshop	Geopolitics activity / selection of presentation topics for Ignite Presentations
Week 2 : 3 June - 9 June	Lecture	International Development and Need
	Lecture	Overview of SDGs, Sendai Framework and Sphere Guidelines
	Workshop	Ignite presentations (sesion 1 of 2)
Week 3 : 10 June - 16 June	Lecture	Energy and Development
	Lecture	The UN Sustainable Development Goals
	Workshop	Ignite presentations (sesion 2 of 2)
Week 4 : 17 June - 23 June	Lecture	Water and Development
	Lecture	Humanitarian Disaster: the Sphere Guidelines
	Workshop	Virtual Reality Session / Group Project + Poster reviews
Week 5 : 24 June - 30 June	Lecture	Human Rights
	Lecture	Nexus Social Simulation, Lecture time slot used for Social Simulation in Design Studio
	Other	Nexus Social Simulation, workshop time slot used for Social Simulation in Design Studio, following on from Lecture timeslot (OTH in timetable)
Week 6 : 1 July - 7 July	Lecture	No classes
Week 7 : 8 July - 14 July	Lecture	Ethics and professional practice in Humaitarian Engineering
	Lecture	Human Centered Design Process
	Workshop	Human Centre Design Workshop (Michael Crouch Innovation Centre)
Week 8 : 15 July - 21 July	Lecture	Human Health and Water, Sanitation and Hygiene
	Lecture	Humanitarian Engineerign and Aboriginal communities in Australia
	Workshop	Virtual Reality / Group Report and Poster dedicated work time
Week 9 : 22 July - 28 July	Lecture	Infrastructure in Development (World Bank)
	Lecture	Climate and Disasters
	Other	Workshop slot is replaced by "OTH" as per timetable for the Research Showcase to present Posters to audiences in the Design Studio
Week 10 : 29 July - 4 August	Lecture	Nature-based solutions and sustainable approaches
	Lecture	Working in Humanitarian Engineering
	Workshop	Infographic Showcase

Attendance Requirements

Students are strongly encouraged to attend all classes and review lecture recordings.

General Schedule Information

This course has no exam and engagement and discussion in the lectures and workshops is required to successfully incorporate humanitarian engineering concepts into your summative tasks and do well in the course. 80% attendance of workshops is compulsory. Assessment items will be held in some Workshops for that Ignite Presentations and the Research Showcase (as per course schedule). Attendance for the interactive water, energy, food social simulation (2 hour Lecture plus 3 hour "OTH' session) is a highlight of the class based on student feedback in previous years.

Course Resources

Prescribed Resources

Please see course page on Moodle

Recommended Resources

Please see course page on Moodle

Course Evaluation and Development

MyExperience results are reviewed at end of term and used to improve course for delivery the following year.

Staff Details

Position	Name	Email	Location	Phone	Availability	Equitable Learning Services Contact	Primary Contact
Convenor	Andrew Daniels		H20, 306	MS Teams	Please email to arrange time to meet face to face or virtually.	No	Yes
	Laura Montañó Luna					No	No
Dominator	Khadija al Nabhani					No	No
	John Ogbe					No	No
	Charlotte Wang					No	No

Other Useful Information

Academic Information

I. Special consideration and supplementary assessment

If you have experienced an illness or misadventure beyond your control that will interfere with your assessment performance, you are eligible to apply for Special Consideration prior to, or within 3 working days of, submitting an assessment or sitting an exam.

Please note that UNSW has a Fit to Sit rule, which means that if you sit an exam, you are declaring yourself fit enough to do so and cannot later apply for Special Consideration.

For details of applying for Special Consideration and conditions for the award of supplementary assessment, please see the information on UNSW's [Special Consideration page](#).

II. Administrative matters and links

All students are expected to read and be familiar with UNSW guidelines and polices. In particular, students should be familiar with the following:

- [Attendance](#)
- [UNSW Email Address](#)
- [Special Consideration](#)
- [Exams](#)
- [Approved Calculators](#)
- [Academic Honesty and Plagiarism](#)
- [Equitable Learning Services](#)

III. Equity and diversity

Those students who have a disability that requires some adjustment in their teaching or learning environment are encouraged to discuss their study needs with the course convener prior to, or at the commencement of, their course, or with the Equity Officer (Disability) in the Equitable Learning Services. Issues to be discussed may include access to materials, signers or note-takers, the provision of services and additional exam and assessment arrangements. Early notification is essential to enable any necessary adjustments to be made.

IV. Professional Outcomes and Program Design

Students are able to review the relevant professional outcomes and program designs for their streams by going to the following link: <https://www.unsw.edu.au/engineering/student-life/student-resources/program-design>.

Note: This course outline sets out the description of classes at the date the Course Outline is published. The nature of classes may change during the Term after the Course Outline is published. Moodle or your primary learning management system (LMS) should be consulted for the up-to-date class descriptions. If there is any inconsistency in the description of activities between the University timetable and the Course Outline/Moodle/LMS, the description in the Course Outline/Moodle/LMS applies.

Academic Honesty and Plagiarism

UNSW has an ongoing commitment to fostering a culture of learning informed by academic integrity. All UNSW students have a responsibility to adhere to this principle of academic integrity. Plagiarism undermines academic integrity and is not tolerated at UNSW. *Plagiarism at UNSW is defined as using the words or ideas of others and passing them off as your own.*

Plagiarism is a type of intellectual theft. It can take many forms, from deliberate cheating to accidentally copying from a source without acknowledgement. UNSW has produced a website with a wealth of resources to support students to understand and avoid plagiarism, visit: <student.unsw.edu.au/plagiarism>. The Learning Centre assists students with understanding academic integrity and how not to plagiarise. They also hold workshops and can help students one-on-one.

You are also reminded that careful time management is an important part of study and one of the identified causes of plagiarism is poor time management. Students should allow sufficient time for research, drafting and the proper referencing of sources in preparing all assessment tasks.

Repeated plagiarism (even in first year), plagiarism after first year, or serious instances, may also be investigated under the Student Misconduct Procedures. The penalties under the procedures can include a reduction in marks, failing a course or for the most serious matters (like plagiarism in an honours thesis or contract cheating) even suspension from the university. The Student Misconduct Procedures are available here:

www.gs.unsw.edu.au/policy/documents/studentmisconductprocedures.pdf

Submission of Assessment Tasks

Work submitted late without an approved extension by the course coordinator or delegated authority is subject to a late penalty of five percent (5%) of the maximum mark possible for that assessment item, per calendar day.

The late penalty is applied per calendar day (including weekends and public holidays) that the assessment is overdue. There is no pro-rata of the late penalty for submissions made part way through a day. This is for all assessments where a penalty applies.

Work submitted after five days (120 hours) will not be accepted and a mark of zero will be awarded for that assessment item.

For some assessment items, a late penalty may not be appropriate. These will be clearly indicated in the course outline, and such assessments will receive a mark of zero if not completed by the specified date. Examples include:

- Weekly online tests or laboratory work worth a small proportion of the subject mark;
- Exams, peer feedback and team evaluation surveys;
- Online quizzes where answers are released to students on completion;
- Professional assessment tasks, where the intention is to create an authentic assessment that has an absolute submission date; and,
- Pass/Fail assessment tasks.

Faculty-specific Information

[Engineering Student Support Services](#) – The Nucleus - enrolment, progression checks, clash requests, course issues or program-related queries

[Engineering Industrial Training](#) – Industrial training questions

[UNSW Study Abroad](#) – study abroad student enquiries (for inbound students)

[UNSW Exchange](#) – student exchange enquiries (for inbound students)

[UNSW Future Students](#) – potential student enquiries e.g. admissions, fees, programs, credit transfer

Phone

(+61 2) 9385 8500 – Nucleus Student Hub

(+61 2) 9385 7661 – Engineering Industrial Training

(+61 2) 9385 3179 – UNSW Study Abroad and UNSW Exchange (for inbound students)

School-specific Information

Final Examinations

Final Exams in T2 2024 will be held on campus between the 9th - 22nd August, and Supplementary Exams between the 2nd - 6th September 2024. You are required to be available on these dates. Please do not make any personal or travel arrangements during this period.

School Contact Information

For assistance with enrolment, class registration, progression checks and other administrative matters, please see [the Nucleus: Student Hub](#). They are located inside the Library – first right as you enter the main library entrance. You can also contact them via <http://unsw.to/webforms> or reserve a place in the face-to-face queue using the UniVerse app.

For course administration matters, please contact the Course Coordinator.

Questions about this course should normally be asked during the scheduled class so that everyone can benefit from the answer and discussion.