ENGG3001 FUNDAMENTALS OF HUMANITARIAN ENGINEERING

COURSE DETAILS

Units of Credit	**6**	
Contact hours	6 hours per week	
Class	Mondays, 10:00 -12:00	Online, Blackboard Ultra
	Thursdays, 10:00 - 12:00	Online, Blackboard Ultra
Workshop	Thursdays, 13:00 –-15:00	Online, Blackboard Ultra
	Thursdays, 16:00 – 18:00	Online, Blackboard Ultra
Course Coordinator and Lecturer	Dr Andrew Dansie	
	email: a.dansie@unsw.edu.au	
	office: CE306	
	phone: Arrange to call on Microsoft Teams during COVID-19 remote teaching	

INFORMATION ABOUT THE COURSE

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.

The course forms the first part of the optional Humanitarian Engineering discipline and for students who are interested then you may follow this course with ENGG4102, ARTS2755 or other courses in the Faculty of Engineering focusing on Humanitarian Engineering.

HANDBOOK DESCRIPTION

See link to virtual handbook:

https://www.handbook.unsw.edu.au/undergraduate/courses/2020/ENGG3001

OBJECTIVES

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 in independent and reflective learning.

These objectives link to the following program outcomes:

- 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
- Information literacy
- Skills for effective communication
- Ethical conduct and professional accountability
- Understanding of the scope, principles, norms, accountabilities and bounds of sustainable engineering practice
- Effective team membership and team leadership.

TEACHING STRATEGIES

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. Guest lecturers with recent experience of humanitarian engineering projects will be invited to provide lectures and case study. Workshops will promote group work as well as a cross-cultural role play and group presentations.

The following teaching strategies will be used in the course:

Private Study / Group Work	• Review lecture material and textbook
	• Do set problems and assignments
	• Join Moodle discussions of problems
	• Reflect on class problems and assignments
	• Download materials from Moodle
	• Keep up with notices and find out marks via Moodle
Lectures	• Actively participate in lecture discussions
	• Find out what you should learn
	• Cover content not provided in readings or notes
Workshops	• Be active in workshops and group activities
	• Participate in guest lecture / workshop activities
	• Ask questions on assessment tasks
Assessments	• Demonstrate your knowledge and skills
	• Demonstrate higher understanding and problem solving

EXPECTED LEARNING OUTCOMES

This course is designed to address the learning outcomes below and the corresponding Engineers Australia Stage 1 Competency Standards for Professional Engineers as shown. The full list of Stage

1 Competency Standards may be found in Appendix A.

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

	Learning Outcome	EA Stage 1 Competencies
1.	*Demonstrate understanding of the principles of Humanitarian Engineering*	*PE1.3, PE1.6*
2.	*Demonstrate understanding of the important design considerations in Humanitarian Engineering projects.*	*PE1.5*
3.	*Evaluate the success of humanitarian engineering projects*	*PE2.4*
4.	*Analyse the skills and attributes required to work in humanitarian engineering contexts*	*PE3.5, PE3.6*
5.	*Demonstrate high level communication skills through effective oral presentation*	*PE3.2*
6.	*Demonstrate cultural sensitivity and ethical behaviour*	*PE3.1*

For each hour of contact it is expected that you will put in at least 1.5 hours of private study.

COURSE PROGRAM

A table of lectures and workshops or practical class topics for each week, indicating the name of lecturer involved (where multiple lecturers teaching in course), online activities, such as discussion forums, and relevant readings from textbook and other reference material identified for the course.

Term 2 2020

Date	Topic	Lecture Content	Demonstration Content
01/06/2020 (Week 1)	**- Introduction to HE** **- Human Health and WaSH**	A. Dansie P. Byleveld (NSW Health / Red Cross)	Geopolitics activity, Ignite presentation Country and Topic selection
08/06/2020 (Week 2)	**- Who are the players in development & defining need** **- Engineering ethics in development projects**	A. Dansie (Pre-recorded lecture due to Public Holiday. Please contact me with questions) R. Care (RedR Australia)	Ignite presentations / Group Work Group selection
15/06/2020 (Week 3)	**- Climate change adaptation and disaster risk reduction** **- Frameworks for HE**	F. Johnson S. Schmeidl	Ignite presentations / Group Work
22/06/2020 (Week 4)	**- Urban disaster resilience and humanitarian aid** **- Geopolitics and history / Social Simulation introduction**	D. Sanderson A. Dansie	Social Simulation Debriefing and Self-reflection training
29/06/2020 (Week 5)	**- Water / Introduction to Design Thinking workshop** **- Energy**	A. Dansie / Michael Crouch Innovation Centre A. Bruce	Design Thinking

06/07/2020 (Week 6)		*Flexibility week for all courses (non-teaching)*	
13/07/2020 (Week 7)	**- Food Security** **- Infrastructure and Development**	J. Selleweha (CSIRO/WFP) S. Johnson (World Bank)	Virtual Reality Lab
20/07/2020 (Week 8)	**- Community-led Development** **- Human Rights**	C. Kutay (CDU) Australian Human Rights Institute	Do no harm workshop
27/07/2020 (Week 9)	**- Humanitarian Architecture with UNHCR** **- Panel Discussion**	D. Anderson (UNHCR) Invited guests	Group Work and feedback from Demonstrators
03/08/2020 (Week 10)	**- Research Showcase** **- Research Showcase**		Group Work and feedback from Demonstrators

ASSESSMENT

The assessment tasks for this course have been developed to assess each student's achievements in terms of each of the six learning outcomes listed above.

Assignments are group and individual assessments to assess the students' understanding of the concepts in agreement with the learning objectives.

The final course mark will be based on you completing the coursework as per the table below.

Students who perform poorly in the assignments are recommended to discuss progress with the lecturer during the semester. Note: The lecturer reserves the right to adjust the final scores by scaling if agreed by the Head of School.

Assessment Task	Assessment Details	Due Date
Humanitarian engineering reflection	Essay reflecting on skills and opportunities for a career in humanitarian engineering and your world view after taking the course.	Wednesday 15th July (Week 7)
Presentation	Ignite presentation (5 minutes, 20 slides)	File submitted Wed 10th June. Presentations Thursday 11th and 18th June (Weeks 2 and 3) – you will be allocated to a group in the Week 1 Workshop
Group Report and poster	Critically analyse and evaluate a HE case study or technology	Poster: Wednesday 29th July (Week 9) Report: Monday 10th August (Week 11)

PENALTIES

Late work will be penalised at the rate of 10% per day after the due time and date have expired.

ASSESSMENT OVERVIEW

Item	Weighting	Learning outcomes assessed	Assessment Criteria	Due date	Deadline for absolute fail	Marks returned
Presentations	20%	5	Presentations will be assessed on content and communication style including timing, technical information, clarity of speech, clarity and usefulness of visual aids.	Thursday 4th and 11th June (Weeks 2 and 3) – you will be allocated to a group in Week 1 Workshop.	11th June (Week 3)	Friday 19th June (Week 3)
Humanitarian Engineering Reflection	30%	4, 6	Essay reflecting on skills and opportunities for a career in humanitarian engineering and your world view after taking the course.	Wednesday 15th July (Week 7)	Wednesday 22nd July (Week 8)	Wednesday 29th July (Week 9)
Project report and poster	50%	1, 2, 3	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 and clarity of poster presentation.	Poster: Wednesday 29th July (Week 9) Report: Monday 10th August (Week 11)	Monday 17th August (Week 12)	Monday 24th August (Week 13)

RELEVANT RESOURCES

There is no textbook for this course and required and recommended reading will be provided on Moodle.

DATES TO NOTE

Refer to MyUNSW for Important Dates available at:

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

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

(Formerly known as Common School Information)

For information about:

- Notes on assessments and plagiarism,
- School policy on Supplementary exams,
- Special Considerations: student.unsw.edu.au/special-consideration
- Solutions to Problems,
- Year Managers and Grievance Officer of Teaching and Learning Committee, and
- CEVSOC.

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

Appendix A: Engineers Australia (EA) Competencies

Stage 1 Competencies for Professional Engineers

	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