Cornerstone of Engineering I Course Descriptor

Course Code	LENGR4117	Discipline	Engineering
Credit Points	15	US Credits	4
FHEQ Level	4	Date Approved	August 2022
Core Attributes			
Pre-Requisites	N/A		
Co-Requisites	N/A		

Course Summary

This course introduces students to the engineering design process and algorithmic thinking, using a combination of lectures and hands-on projects while encouraging critical thinking. It offers students an opportunity to develop creative problem-solving skills used in engineering design, to structure software, and to cultivate effective written and oral communication skills.

Course Aims

- Discover how to implement programming and execution of a design through the interactive design process using authentic hands-on design projects.

- Integrate value-sensitive design (qualitative assessment of design impact on users and society), ethical principles, and professional responsibilities into engineering design.

- Develop problem-solving skills in algorithmic thinking through computer programming.

Learning Outcomes

On successful completion of the course, students will be able to:

Knowledge and Understanding

K1a   Demonstrate an understanding of the engineering design process.

K2a   Research the scientific principles, technical background required to understand the problem to be solved, and benchmark existing or related products.

K3a   Demonstrate an understanding of risk management in engineering practices.

Subject Specific Skills

S1a   Implement the desired design solutions using appropriate engineering techniques.

S2a   Analyse and interpret computational and experimental results as part of engineering practice.

S3a   Demonstrate the concept of engineering design by using modern drawing and or sketching software tools and the principles of orthographic projection.

Transferable and Professional Skills

T1a   Communicate effectively with specialist and non-specialist audiences.

T2a   Apply problem-solving skills to the conception of a particular solution.

Teaching and Learning

Teaching and learning strategies for this course will include:

A minimum of 40 contact hours, typically to include interactive group teaching, co-curriculars, individual meetings, in-class presentations and exams.

Course information and supplementary materials are available on the University's Virtual Learning Environment (VLE).

Students will receive individualised developmental feedback on their work for this course.

Students are required to attend and participate in all the formal and timetabled sessions for this course. Students are also expected to manage their directed learning and independent study in support of the course.

Assessment

Formative

Students will be formatively assessed in class through class activities, and during office hours. Formative assessments are ones that do not count towards the final grade but will provide students with developmental feedback.

Summative

AE:	Assessment Activity	Weighting (%)	Online submission	Duration	Length
1	Design Projects	30	Yes - Report No - Presentation and Artifact	15-25 hours to complete	N/A
2	Written Examination	20	Yes	1hr45min	N/A
3	Written Examination	20	Yes	1hr45min	N/A
4	Portfolio	30	Yes	10-20 hours to complete	N/A

Further information on the structure of summative assessment elements can be found in the Summative Assessment Briefs.

Feedback

Students will receive feedback in a variety of ways: written (including via email correspondence); oral (within office hours or on an *ad hoc* basis) and indirectly through class discussion.

Feedback on examinations is provided through generic internal examiners' reports and are made available to the student on the VLE.

For all other summative assessment methods, feedback is made available to the student either via email, the VLE or another appropriate method.

Indicative Reading

Note: Comprehensive and current reading lists for courses are produced annually in the Course Syllabus or other documentation provided to students; the indicative reading list provided below is used as part of the approval/modification process only.

Books
- "Cornerstone of Engineering", TopHat

Electronic Resources

- matlab
- solidworks
- AutoCAD
- TOP HAT VLE
- Arduino IDE
- CLion / C++ complier

Indicative Topics

C++ Arduino Excel AutoCAD & Orthography Technical Communication

- C++ and Arduino Programming
- AutoCAD and solidworks design skills
- Orthography Technical Communication
- Creative self-led design projects

Title: LENGR4117 Cornerstone of Engineering I Course Descriptor Approved by: Academic Board Location: Academic Handbook/Programme Specifications and Handbooks/Mobility Courses					
Version Number	**Date Approved**	**Date Published**	**Owner**	**Proposed Next Review Date**	**Modification (As per AQF4) & Category Number**
1.2	January 2022	January 2022	Dr Susan Freeman	September 2027	Category 1: Corrections/clarifications to documents which do not change approved content. Category 1: Administrative changes to 'Online Submission' for AE1, AE2 and AE3.
1.0	August 2022	August 2022	Dr Susan Freeman	August 2027	