Module Code:	ENG348

Module Title:	Design and Technology

Level:	3	**Credit Value:**	20

Cost Centre(s):	GAAE	JACS3 **code**:	H130

Faculty:	Faculty of Arts, Science and Technology	**Module Leader:**	R Hebblewhite

Scheduled learning and teaching hours	40 hrs
Guided independent study	10 hrs
Placement	0 hrs
Module duration (total hours)	200 hrs

Programme(s) in which to be offered (not including exit awards)	Core	Option
BEng (Hons) Aeronautical and Mechanical Engineering (with Foundation Year)	✓	☐
BEng (Hons) Electrical and Electronic Engineering (with Foundation Year)	✓	☐
BEng (Hons) Automotive Engineering (with Foundation Year)	✓	☐
BEng (Hons) Renewable and Sustainable Engineering (with Foundation Year)	✓	☐
BEng (Hons) Automation Engineering	✓	☐
BSc (Hons) Computer Game Design and Enterprise (with Foundation Year)	✓	☐
BSc (Hons) Computer Game Development (with Foundation Year)	✓	☐
BSc (Hons) Computer Science (with Foundation Year)	✓	☐
BSc (Hons) Computing (with Foundation Year)	✓	☐
BSc (Hons) Computer Networks and Security(with Foundation Year)	✓	☐
BSc (Hons) Cyber Security (with Foundation Year)	✓	☐

Pre-requisites
None

Module Aims

The module will develop an appreciation of the key technical elements of design and the use of technology in its practical application. It will also develop an appreciation of the various social, ethical, legal and economic issues that relate to real world design projects and their impact on decision making and project outcomes.

Through the above process, the module will enable an understanding of the student's own design, decision making process and work flow through engagement in one or more design and production practices.

Intended Learning Outcomes

Key skills for employability

KS1	Written, oral and media communication skills
KS2	Leadership, team working and networking skills
KS3	Opportunity, creativity and problem solving skills
KS4	Information technology skills and digital literacy
KS5	Information management skills
KS6	Research skills
KS7	Intercultural and sustainability skills
KS8	Career management skills
KS9	Learning to learn (managing personal and professional development, self-management)
KS10	Numeracy

At the end of this module, students will be able to		Key Skills	
1	Demonstrate an understanding of the fundamental principles and practices related to technical design and the impact of design decisions on project outcomes.	KS1	KS3
		KS5	KS10
2	Engage within industry standard tools and techniques in relation to a technical design project.	KS4	KS5
3	Demonstrate awareness of the social, ethical and economic issues relating to a technical design project and their potential impact on the wider industry.	KS7	KS2

Transferable skills and other attributes

N/A

Derogations

None

Assessment:

Indicative Assessment Tasks:

Students will be tasked with the development of a portfolio that relates to a modern design challenge/problem.

The portfolio will consist of regular challenges and tasks that will be set throughout the duration of the module. Primary components may be:
- A product design
- Completed Photoshop/CAD/Design application tutorial and tasks
- Deployment strategy
- Kickstarter plan
- Mobile App store layout and descriptors

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)	Duration (if exam)	Word count (or equivalent if appropriate)
1	1,2,3	Portfolio	100%	n/a	2,500

Learning and Teaching Strategies:

The primary skill base of this module will be delivered through a series of lectures, demonstrations and studio workshops which will equip the students with the theoretical and practical means to comprehend the principles relating to technical design and its associated tools and technologies.

Topics will be introduced on a weekly basis through lectures and practical demonstrations, and then further supported with the use of weekly class tutorial tasks and design challenges.

It is expected that students will continue to work on these tasks and challenges outside of class time and demonstrate evidence of completion using methods such as regular reflective journal entries, project diaries or other recognised techniques. Some supervised class time will be available for additional support of this process.

Syllabus outline:

- Effective brainstorming, rapid application design and conceptualization.

- Research, design and planning.

- Phases of design, Evaluation, Design considerations, Codes and standards. Ethical considerations.

- Project lifecycle.

- Requirements gathering.

- Reliability. Economics of the design.

Other Indicative Examples:

Interactive media design techniques and methodologies.

Media production cycle.

Web and app design strategies.

Processes and techniques for design engineering
Algorithm design and problem solving using maths fundamentals.

Simulation and modelling.

Architectural and product design: tools and techniques.

Indicative Bibliography:
Essential reading

Morris, R. (2016). *The Fundamentals of Product Design*. Paperback. Fairchild Books; 2nd Revised edition.

Cotton, D. (2016*). The Smart Solution Book: 68 Tools for Brainstorming, Problem Solving and Decision Making*. FT Publishing International.

Other indicative reading

CADFolks. (2018). *AutoCAD 2019 For Beginners*. Paperback. CreateSpace Independent Publishing Platform.

Macklin, C. (2016) *Games, Design and Play: A Detailed Approach to Iterative Game Design.* Addison-Wesley Professional.

Dym, Clive, L. (2014). *Engineering Design: A Project-Based Introduction*. Paperback. John Wiley & Sons

Gardetti, M,A. Muthu, S,S. (2018). *Sustainable Luxury, Entrepreneurship, and Innovation (Environmental Footprints and Eco-design of Products and Processes).* Springer.