ES2D2-15 Mechanical Engineering Design

22/23

Department
School of Engineering
Level
Undergraduate Level 2
Module leader
Simon Leigh
Credit value
15
Module duration
20 weeks
Assessment
100% coursework
Study location
University of Warwick main campus, Coventry

Description

Introductory description

n/a.

Module web page

Module aims

This stream-specific second year design module focusses on creative practice and practical aspects of problem solving. Supported by development of CAD proficiency & manufacturing experience.

Outline syllabus

This is an indicative module outline only to give an indication of the sort of topics that may be covered. Actual sessions held may differ.

- Developing/emerging technologies
- Factors affecting engineering design

- Writing specifications and understanding user requirements
- Design process/stages, including FMEA
- Project management
- Creative design practices
- Design development and analysis using CAE / CAD
- Working with others & team roles
- Communication skills

Learning outcomes

By the end of the module, students should be able to:

- Interpret the broad range of needs, perspectives & factors which affect all engineering projects.
- Appraise requirements in order to write a specification, evaluate the information provided for completeness and carry out research or experimentation to manage the technical uncertainty.
- Select an appropriate design process/stages model and employ it (& other appropriate project management tools) to manage a design project.
- Apply the engineering fundamentals learnt throughout this & the other modules studied during the course, to design & price a sustainable product to meet a specification.
- Evaluate the success of the product, design improvements to it and communicate the improved product to a non-technical audience.
- Recognise roles & skill sets of team members, select roles & work in teams whilst also taking personal responsibility.

Research element

Students must develop an awareness of emergent technologies/research within engineering. As such, they have a library session, and a 'speed dating' session with our researchers. From this they pick a topic to learn more about and carry out a literature review in order to write an article/vlog.

Subject specific skills

1. Plan and manage the design process, including cost drivers, evaluating outcomes, and working with technical uncertainty
2. Knowledge and understanding of risk issues, including health & safety, environmental and commercial risk, risk assessment and risk management techniques and an ability to evaluate commercial risk

Transferable skills

1. Numeracy: apply mathematical and computational methods to communicate parameters, model and optimize solutions

2. Apply problem solving skills, information retrieval, and the effective use of general IT facilities
3. Communicate (written and oral; to technical and non-technical audiences) and work with others
4. Exercise initiative and personal responsibility, including time management, which may be as a team member or leader
5. Be professional in their outlook, be capable of team working, be effective communicators, and be able to exercise responsibility and sound management approaches.

Study

Study time

Type	Required
Lectures	5 sessions of 1 hour (3%)
Seminars	19 sessions of 1 hour (13%)
Practical classes	1 session of 2 hours (1%)
Supervised practical classes	4 sessions of 2 hours (5%)
Other activity	3 hours (2%)
Private study	113 hours (75%)
Total	150 hours

Private study description

Online learning available via Moodle. Students own reading & research will be required for them to understand the problems the clients set and develop solutions to these problems.

Other activity description

Design showcase

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A3

	Weighting	Study time	Eligible for self-certification
Assessment component			
Group design portfolio	50%		No
Design portfolio assignment - Maximum of 20 A4 pages plus appendix including peer assessment			
Reassessment component			
Individual design portfolio			No
An individual design assignment based on a design problem - maximum of 8 A4 pages in length			
Assessment component			
Prototype and poster including peer assessment	50%		No
Design showcase where students present a prototype & poster			
Reassessment component			
Individual Recorded Video Presentation			No
An individual recorded presentation based on the group design project.			

Feedback on assessment

Written feedback on design portfolio.
Verbal feedback on prototype & poster.
In session feedback of developing design.
Peer review of developing design in seminars.

Availability

Post-requisite modules

If you pass this module, you can take:

- ES3C2-15 Advanced Mechanical Engineering Design

Courses

This module is Core for:

- Year 2 of UESA-H315 BEng Mechanical Engineering
- UESA-H316 MEng Mechanical Engineering
    - Year 2 of H315 Mechanical Engineering BEng
    - Year 2 of H316 Mechanical Engineering MEng

This module is Option list A for:

- Year 2 of UESA-H161 BEng Biomedical Systems Engineering
- Year 2 of UESA-H113 BEng Engineering
- Year 2 of UESA-H112 BSc Engineering
- Year 2 of UESA-HN11 BSc Engineering and Business Studies
- Year 2 of UESA-H163 MEng Biomedical Systems Engineering
- Year 2 of UESA-H114 MEng Engineering