ES410-30 Group Project

20/21

Department
School of Engineering
Level
Undergraduate Level 4
Module leader
Gary Fowmes
Credit value
30
Module duration
25 weeks
Assessment
100% coursework
Study location
University of Warwick main campus, Coventry

Description

Introductory description

ES410-30 Group Project

Module web page

Module aims

The group projects aim to give students experience of working within a team, and parallels the way engineers often work in industry. Students will integrate their knowledge and understanding in order to specify and solve a substantial engineering problem (or user need), through the creation and development of a product, process or system. The project also allows students to develop their understanding of project management, time management, ethics, sustainability, health and safety, risk and intellectual property rights. Students will develop effective communication and leadership skills.

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.

Projects will vary in nature. Many will be ‘design and make’ type projects. In this case small unit manufacture of prototype solutions may be possible and if required will be specified as part of the project briefing. Other projects will be more focussed on design and proof of concept stage, and might include no realization of the design in a physical form. Examples of this are likely in Civil Engineering projects where the logistical implications of large scale build are not manageable in terms of project costs, manpower, or timescales. Yet more projects may be evaluation exercises using proprietary software. Others may be restoration or re-commissioning projects, whilst others will be design evolutions of high-technology / high-complexity systems such as race-cars.

In each case the project will normally involve groups of 6 students from a cross section of degree streams. Tasks will be predetermined by the School of Engineering / WMG staff Project Director each year to match the skills and mix of the students. Where possible projects will ideally have industrial backing or at least be able to demonstrate industrial applicability

Depending on the product selected, consideration will be given to design concept, mechanical and/or structural design, materials selection, stress analysis, dynamic performance, electrical/electronic design, control theory, actuator selection, sensors, computer interfacing, signal processing, control software, process planning, facilities planning, process design and development, production economics, customer needs, scheduling, quality control, materials control, tooling requirements, sales and marketing, management structure, programming, manufacturing, procurement, financial planning and management, promotion of the work to a wider public audience or whatever the most suitable vehicle is to measure the stated learning outcome in terms of measuring students’ ability to develop their engineering skills and competencies.

Students will be encouraged assume the positions of design engineers, development engineers, production engineers, test engineers, project managers, etc. in the delivery of the project. Each student will have an agreed responsibility within their own specialisation, but will have to interact with other disciplines and hence appreciate the complexities of complete systems from both the technical and organisational point of view. This will develop the engineer’s ability to think and communicate in terms of integrated systems.

A member of staff is appointed as Project Director, will provide guidance on technical and organisational matters. Usually a student member of the group will be appointed as the Project Manager. Regular meetings take place with formal minutes to provide a record of decisions. The project be communicated via an academic poster, testing the students’ ability to rapidly communicate complicated ideas, systems, or processes. Furthermore it will require a formal write-up describing it’s delivery in detail, and a reasoned financial cost-benefit analysis. An oral presentation will takes place at the start of term 3 where the whole team will describe the project to an academic audience and answer question on its delivery.

Learning outcomes

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

- Extrapolate existing knowledge and experience and apply them in an integrated systems approach to solve a complex and unfamiliar engineering problem.
- Extract and critically evaluate relevant data in order to apply engineering analysis and advanced problem solving skills, in order to complete an engineering project to the

satisfaction of a customer and/or user.
- Use innovative techniques, materials or methods in delivering the project.
- Consider the wider context of the project including, risk, health and safety, ethics, environmental and sustainability limitations, intellectual property rights, codes of practice and standards, product safety and liability, to inform the project specification (problem brief) as relevant to the project.
- Plan and manage a project from the design process to a deliverable outcome, including managing a budget and costs, and understanding the commercial, economic and social environment of the project.
- Demonstrate effective communication, both verbal and written, to a technical and non-technical audience.
- Demonstrate the ability to work as a member of a team to achieve shared objectives within the scope of the project and monitor and adjust a personal programme of work on an on-going basis.

Research element

Varies from project to project, but all involve some research of prior work or state of the art within the chosen field.

Subject specific skills

Ability to generate an innovative design for products, systems, components or processes to fulfill new needs.

Ability both to apply appropriate engineering analysis methods for solving complex cross disciplinary problems in engineering and to assess their limitations.

Transferable skills

Ability to apply engineering techniques, taking account of a range of commercial and industrial constraints

Ability to use fundamental knowledge to investigate new and emerging technologies.

Awareness of and ability to make general evaluations of risk issues in the context of the particular specialisations, including health & safety

Ability to apply engineering techniques, taking account of a range of commercial and industrial constraints

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Study

Study time

Type	Required
Lectures	5 sessions of 1 hour (2%)
Project supervision	25 sessions of 1 hour (8%)
Private study	270 hours (90%)
Total	300 hours

Private study description

Students are expected to contribute a total of 270 hours to the project in addition to the 25 hours project supervision and 5 hours of supporting Lectures leading to a total of 300 hours work per student.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Students can register for this module without taking any assessment.

Assessment group A2

	Weighting	Study time	Eligible for self-certification
Assessment component			
Peer assessment and statement of contribution.	15%		No
Based on individual contribution, evaluated via peer assessment and statement of contribution, and agreed by the project director.			
Reassessment component is the same			
Assessment component			
Group Presentation & Paper	30%		No
Group Presentation and conference paper			

	Weighting	Study time	Eligible for self-certification
Reassessment component is the same			
Assessment component			
Group Portfolio Assignment	55%		No
Group Portfolio: containing a range of professional and engineering documents submitted at stages throughout the project			
Reassessment component is the same			

Feedback on assessment

Verbal feedback during group meetings with Project Director, milestone report feedback and feedback on the formal presentation
Written feedback on poster, design report, cost benefit report and presentation

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Availability

Courses

This module is Core for:

- Year 4 of UESA-H336 MEng Automotive Engineering
- Year 4 of UESA-H163 MEng Biomedical Systems Engineering
- Year 4 of UESA-H217 MEng Civil Engineering
- Year 4 of UESA-H219 MEng Civil Engineering with Exchange Year
- Year 4 of UESA-H63X MEng Electronic Engineering
- Year 5 of UESA-H636 MEng Electronic Engineering with Intercalated Year
- Year 4 of UESA-H114 MEng Engineering
- Year 4 of UESA-HH76 MEng Manufacturing and Mechanical Engineering
- Year 5 of UESA-HH38 MEng Manufacturing and Mechanical Engineering with Intercalated Year
- UESA-H311 MEng Mechanical Engineering
    - Year 4 of H311 Mechanical Engineering
    - Year 4 of H30J Mechanical Engineering with Appropriate Technology
    - Year 4 of H30L Mechanical Engineering with Automotive Engineering
    - Year 4 of H30G Mechanical Engineering with Business Management
    - Year 4 of H30P Mechanical Engineering with Fluid Dynamics

    - Year 4 of H30K Mechanical Engineering with Instrumentation
    - Year 4 of H30M Mechanical Engineering with Robotics
    - Year 4 of H30H Mechanical Engineering with Sustainability
    - Year 4 of H30N Mechanical Engineering with Systems Engineering
- Year 4 of UESA-H316 MEng Mechanical Engineering
- Year 4 of UESA-H318 MEng Mechanical Engineering with Exchange Year
- Year 5 of UESA-H317 MEng Mechanical Engineering with Intercalated Year
- Year 4 of UESA-HH31 MEng Systems Engineering
- Year 4 of UCSA-G408 Undergraduate Computer Systems Engineering
- Year 4 of UESA-H606 Undergraduate Electrical and Electronic Engineering MEng