ES2H9-15 Electronic Design Project

25/26

Department
School of Engineering
Level
Undergraduate Level 2
Module leader
Jose Ortiz Gonzalez
Credit value
15
Module duration
10 weeks
Assessment
100% coursework
Study location
University of Warwick main campus, Coventry

Description

Introductory description

Electronic Design Group Project

Module aims

The Electronic Design Group Project is a group project aiming to give students experience of working within a team, and parallel the way engineers often work in industry. Students will integrate their knowledge and understanding in order to specify and solve an Electronic 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 management and intellectual property rights. Students will develop effective communication and leadership skills, for both technical and non-technical audiences.

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: Some may 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 may be more focused on design and proof of concept stage, and might include no realisation of the design in a physical form but can include evaluation exercises using proprietary software.

In each case the project will normally involve small groups (the aim is to have around 6 students). Projects will have industrial backing where possible or at least be able to demonstrate industrial applicability.

Students will be encouraged to assume different roles within the team including that of project manager. A member of staff appointed as Project Director, will provide guidance on technical and organisational matters. Regular meetings will take place with formal minutes to provide a record of decisions.

Teaching support is provided by means of specially oriented technical seminars. These seminars will have the objective of strengthen the skills required for the successful completion of the project and can include electrical/electronic design, sensors, computer interfacing, signal processing, control software, customer needs, scheduling, programming, manufacturing and promotion of the work to a wider public audience. Invited industrial/entrepreneur academic lectures will provide the students the ability to understand the challenges of working in industry and developing innovative solutions.

Supervised laboratory/workshop time is provided, to guide the students in their experimental work, ranging from simulation verification, verification of conceptual design, prototype design and testing.

A group presentation will take place after 5 weeks working on the project, testing the students’ ability to effectively communicate complicated ideas, systems, or processes. The group will describe the project to an academic audience and answer technical and non-technical questions.

Furthermore, it will require a formal write-up describing its delivery in detail, from conception to testing. Including health and safety, risk management and a reasoned financial cost-benefit analysis. The individual technical contribution of each student will conform a technical appendix, which will be assessed

Learning outcomes

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

- Create and develop a product, process or system to solve a complex Electronic Engineering problem and overcome technical challenges by integrating existing and new technical knowledge and experience to produce an innovative solution to the satisfaction of a customer/end user, discussing the importance of quality management[M3(d), M4(d), M11, M14]
- Critically evaluate relevant data (including incomplete and uncertain data) so as to apply engineering analysis and advanced problem solving skills in order to quantify the impact of these findings on the solution and, using theory or research, to mitigate deficiencies. [M3(d), M4(d)]

- Evaluate environmental and societal impact of design solutions (to include the entire life cycle of the product or process) and minimise adverse affects. [M5, M7]
- 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(as appropriate), to inform the project solution [M5, M8, M15]
- Plan and manage a project from the design process to a deliverable outcome, including managing a budget and costs, and understand the commercial, economic and social environment of the project. [M9, M11, M15]
- Present the project to a wide audience, with the aid of digital communication tools [M17]
- Demonstrate the ability to work as a member of a team to achieve shared objectives and project management goals within the scope of the project, then monitor and adjust a personal programme of work on an on-going basis. [M16]
- Technical report writing on complex engineering matters [M17]

Indicative reading list

Ramana M. Pidaparti, Design Engineering Journey, Morgan & Claypool, 2018

Further reading material will be advised based on the nature of the group project.

Subject specific skills

Ability to conceive, make and realise a component, product, system or process

Ability to be pragmatic, taking a systematic approach and the logical and practical steps necessary for, often complex, concepts to become reality

Ability to be risk, cost and value-conscious, and aware of their ethical, social, cultural, environmental, health and safety, and wider professional engineering responsibilities

Ability to seek to achieve sustainable solutions to problems and have strategies for being creative and innovative

Transferable skills

Exercise initiative and personal responsibility, including time management, which may be as a team member or leader

Be professional in their outlook, be capable of team working, be effective communicators, and be able to exercise responsibility and sound management approaches.

Communicate (written and oral; to technical and non-technical audiences) and work with others

Overcome difficulties by employing skills, knowledge and understanding in a flexible manner

Ability to formulate and operate within appropriate codes of conduct, when faced with an ethical issue

Study

Study time

Type	Required
Seminars	10 sessions of 1 hour (7%)
Project supervision	4 sessions of 1 hour (3%)
Supervised practical classes	9 sessions of 3 hours (18%)
Private study	109 hours (73%)
Total	150 hours

Private study description

Students are expected to contribute a total of 109 hours to the project in addition to the 41 hours specified above, leading to a total of 150 hours work per student.

The estimated time for each assessment task is described below:

Group report (65 hours/student , including work on the group tests and writing the group report, which includes a project management section)
Individual technical appendix (35 hours, including work on the individual part and writing the technical report)
Group presentation (9 hours/student)

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A

	Weighting	Study time	Eligible for self-certification
Group Presentation	20%		No

Group Presentation - A group presentation where the whole team will describe the project to an academic audience and answer technical and non-technical questions after its delivery.

The delivery style of the presentation will be selected by the group (pre-recorded video, poster, slide presentation).

	Weighting	Study time	Eligible for self-certification
The allocated individual mark will be informed by peer assessment.			
Group Report	60%		No
A formal write-up of the project, describing its delivery in detail, from conception to testing. Including health and safety, risk management and a reasoned financial cost-benefit analysis, as well as reflect on quality management. The group report has a maximum length of 28 pages. An appendix on Project management is required (maximum 7 pages). This appendix should show evidence of project management, Gantt charts, recording changes to the original plan and highlight the individual contributions. The allocated individual mark will be informed by peer assessment.			
Individual Contribution Technical Appendix	20%		Yes (extension)
The individual technical contribution of each student will form a technical appendix to the group project report. The individual technical contribution is described, including how it relates to the work plan. The maximum length of the individual technical appendix is 8 pages. The individual technical appendix is submitted at the same time as the group report.			

Feedback on assessment

Verbal formative feedback during group meetings with Project Director

Written feedback on individual and group report
Written and verbal feedback on the group presentation

Availability

There is currently no information about the courses for which this module is core or optional.