ES3H6-60 Individual Project

26/27

Department
School of Engineering
Level
Undergraduate Level 3
Module leader
Angeles Rivero Pacho
Credit value
60
Module duration
24 weeks
Assessment
100% coursework
Study location
University of Warwick main campus, Coventry

Description

Introductory description

Individual project. This is a significant 60 credit module which both synthesises work-based and off-the-job learning to date and builds on it to extend knowledge, with some at the forefront of a particular subject of study.

Module aims

All proposed projects should give students the opportunity to achieve the module learning outcomes.
Project handbook will be developed in conjunction with employers and ensure further development of knowledge, skills and behaviours in electromechanical engineering whilst facilitating work-based learning .
Projects will be employer-based and supported by an academic supervisor.
The module aims to provide students with a vehicle to develop and/or integrate knowledge and skills as well as discover and (in some cases) create new knowledge using literature, experimentation or modelling and analysis where appropriate within specific work context.

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.

A range of lectures and/or briefings to include (but not limited to):

- `Finite Element Analysis (plus computer labs to support learning)`
- Introduction to project, risk, and quality systems management methodologies in the context of the project
- Work-based learning, self-directed learning, and professional development evidenced by keeping a logbook
- Reviewing literature
- Constructing, writing and referencing a work-based project report including critical commentary within the framework of a work-based portfolio
- Management and organisation of self and work-based project
- Developing own practitioner research skills and applying them in specific work context

Learning outcomes

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

- Analyse complex electro-mechanical engineering problems to reach substantiated conclusions by applying knowledge of first principles of mathematics, statistics, natural science and engineering principles.
- Select and apply appropriate computational and analytical techniques to model complex electro-mechanical engineering problems, recognising the limitations of the techniques employed.
- Apply an integrated or systems approach to design solutions for complex electro-mechanical engineering problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health and safety, diversity, inclusion, cultural, ethical concerns, codes of practice and conduct, technical literature and industry standards and other sources of information.
- Evaluate the environmental and societal impact of solutions to complex electro-mechanical engineering problems and minimise adverse impacts.
- Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with the project and adopt a holistic and proportionate approach to the mitigation of security risks.
- Select and apply appropriate materials, equipment, engineering technologies and processes, (recognising their limitations), and use practical laboratory and workshop skills to investigate and develop solutions for complex electro-mechanical engineering problems.
- Apply knowledge of engineering management principles, (commercial context, project and change management, and relevant legal matters including intellectual property rights) and discuss the role of quality management systems and continuous improvement in the context of complex electro-mechanical engineering problems.
- Communicate effectively on complex engineering matters with technical and non-technical audiences.
- Plan and record self-learning and development as the foundation for lifelong learning/CPD.

Research element

Student are expected to carry out independent research / investigation within the self study hours and within on the job learning. This may involve collecting primary data, in which case SofE ethical approval must be sought. Research for other literature / sources may be required using both resources available from the University of Warwick library, the employer or other sources as necessary.

Subject specific skills

Communicate technical information with others at all levels, including technical reports and the use of digital tools.
Follow a methodical approach to engineering problem solving.
Establish and report engineering design briefs.
Produce mechanical and electrical designs / drawings / sketches using Computer Aided Design(CAD) and manual systems.
Model real-world mechanical systems efficiently.
Select the design solution for a given electro-mechanical engineering application and environment using data to inform their decisions.
Integrate electrical and mechanical engineering systems, considering new and emerging technologies.
Use appropriate equipment to develop and execute test plans to support electro-mechanical product validation and approval.
Design functional electronic systems and circuits from component level.
Write and document structured programming code for electro-mechanical systems.
Fabricate engineering components and assemblies using specialist manufacturing methods and hand fitting techniques.
Assemble, wire, program and test electrical equipment, motors and control systems.
Plan, manage and lead engineering projects.
Perform risk management for engineering activities.
Comply with statutory and organisational safety requirements.

Transferable skills

Hold paramount the health and safety of themselves and others, and model health and safety conscious behaviour.
Self-motivated, work independently and take responsibility for their actions. Set themselves challenging personal targets and make own decisions.
Communicate confidently to create and maintain working relationships. Be respectful.
Work collaboratively as a team player. Able to work effectively within a team and interact with /help others when required.
Prioritise quality. Follow rules, procedures and principles in ensuring work completed is fit for purpose, and pay attention to detail / error checks throughout activities.
Adjust to different conditions, technologies, situations and environments and to new and emerging technologies.
Exercise responsibilities in an ethical manner, with openness, fairness and honesty.
Respect the environment and the public good. Consider sustainability and the adverse effects of projects and tasks on the wider world, in the short and longer term.
Commit to personal learning and professional development.

Commit to professional standards (or codes of conduct) of their employer and the wider industry.

Study

Study time

Type	Required
Lectures	10 sessions of 1 hour (2%)
Seminars	10 sessions of 1 hour (2%)
Tutorials	20 sessions of 1 hour (3%)
Project supervision	20 sessions of 1 hour (3%)
Work-based learning	425 sessions of 1 hour (71%)
Other activity	30 hours (5%)
Private study	85 hours (14%)
Total	600 hours

Private study description

Literature review, building projects.

Other activity description

30 hours of workshops on EPA (incl. student presentations).

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A2

Assessment component	Weighting	Study time	Eligible for self-certification
Individual oral presentation	20%		No

	Weighting	Study time	Eligible for self-certification
Individual oral presentation (discussion) involving peers, project director, and industry mentor. 20 minutes of presentation + 5 minutes for questions from the audience.			

Reassessment component is the same

Assessment component

Individual portfolio	70%	No

Individual Portfolio: containing a range of professional and engineering documents submitted at stages throughout the project.
Length of the report should be no more than 60 pages (excluding “Title page”, “List of Contents”, “References” and “Appendices” sections).

Reassessment component is the same

Assessment component

Logbook and Professional Development Record including Reflection	10%	No

Evidence of project evolution, CPD, and reflection.
Length of the submission should be no more than 40 pages (excluding title, appendices).

Reassessment component is the same

Feedback on assessment

Individual written feedback on oral presentation, portfolio, and logbook.

Availability

Courses

This module is Core for:

- Year 5 of DESA-H360 Undergraduate Electromechanical Engineering (Degree Apprenticeship)