The University Of Sheffield.

Electronic & Electrical Engineering.

EEE461 INDIVIDUAL INVESTIGATIVE PROJECT

Credits: 30

Course Description including Aims

To provide a structured individual project for "with a Modern Language" students to enable them to carry out practical and/or theoretical work which underpins his/her academic studies and allows for the acquisition and demonstration of a wide range of practical, creative and presentational skills.

Outline Syllabus

Time Allocation

18-20 weeks with a minimum of 200 hours in total (the equivalent of 3 to 4 afternoons per week) in the lab plus a further 100 hours background reading and report writing.

Recommended Previous Courses

The first two years of an EEE degree programme and the level three material in the year abroad.

Assessment

Continuous assessment. Submission of a specification of aims and objectives, initial plan and risk assessment at week 4. Submission of an interim report at week 12. Submission of a project report and a 15 minute presentation at the end of the allocated period.

Recommended Books

None

Objectives

At the end of the project, successful students will be able to

1. Methodically apply engineering principles to the solution of problems, realization of electronic devices or systems or investigations into the properties of electronic engineering materials or devices.
2. Extract and critically assess information from a variety of sources.
3. Collect and use experimental data to evaluate physical principles and make conclusions.
4. Use their knowledge and understanding creatively to solve unfamiliar problems.
4. Manage projects and time when working under time constraints.
5. Maintain detailed log books as records of their technical planning, design and experimental work.
6. Communicate complex technical ideas effectively both orally and in writing.
7. Work at the forefront of knowledge, seeking and assimilating new knowledge and ideas as required.

UK-SPEC/IET Learning Outcomes

Outcome Code	Supporting Statement
SM1p	A wide variety of investigative projects are offered broadly falling within the research groupings of Communications, Semiconductor Materials & Devices and Electrical Machines & Drives. The projects reinforce and expand upon scientific principles and methodology, all within an engineering context. The specific details of the principles and methodology will be dependent on the individual project itself.
SM1m	The projects are closely related to work undertaken in specialist research areas and as such require a comprehensive understanding of the relevant scientific principles.
SM2m/SM2p	Students are expected to express experimental data or computational methodologies using a statistically meaningful process e.g. experimental error or numerical uncertainties.
SM4m	Students undertake a literature search which will give an awareness of related developing state-of-the-art technologies.
SM3p/SM3m	Projects can have requirements from engineering disciplines outside EEE, which can have a major impact on the design solution.
SM6m	Projects can involve a very diverse range of specialisations including some from outside engineering which students will have to engage with and apply within their project.
EA1p	Projects require a range of fundamental techniques in order to solve the challenges.
EA5m	Projects have research elements, where novel solutions need to be developed.
EA2p	The latest modelling and analysis techniques are employed in developing solutions.
EA3p	Projects develop or use computer simulation or design tools to help achieve the objectives.
EA3m	Projects involve a range of modelling and/or analysis techniques to be employed to develop and evaluate effective solutions. The simulation tools are validated against measurements to understand limitations and uncertainties.
EA4p/EA4m	Projects inherently require a systems approach in order for individual aspects to feed in to an overall solution.
EA6m	Projects will generally have some part that is unfamiliar to the students and require them to find and interpret appropriate literature. Many projects use computer based tools in the development of solutions.
D2p/D2m	All projects require the students to define a project specification as a starting point, which includes a risk assessment (safety), Coshh evaluation (safety) and risk management (project management).
D1p/D1m	Projects have very specific user defined outcomes that must be met.
D5p/D5m	Projects will have an agreed financial budget and defined time-frame which must be adhered to.
D4i	Projects are set up not to have a unique or off-the-shelf solution so that the application of technical knowledge and innovation is a requirement.

D4p/D4m	Where appropriate, students are expected to establish solutions that include manufacturing, operation and product life cycle planning as part of each project.
D8m	Projects require demonstration of innovative design or research output.
ET3m/ET3p	Project planning, Gantt charts, time management and risk management analysis is carried out by students.
EP2p/EP2m	Specialised equipment is used in all projects, requiring intimate knowledge.
EP9m	State of the art practices and equipment are employed. Students are required to fully review the current literature to provide an appreciation of any new developments in their project field.
EP2m	Specialist equipment and/or processes are employed in all projects.
EP3p/EP3m	Projects require the demonstration of practical skills in all themes.
EP1p/EP1m	Students are expected to place their project topic in context to wider engineering applications as part of the initial project specification and also the final thesis.
EP10m	All projects are given constraints.
EP4p/EP4m	All projects involve an initial literature review and the use of a variety of resources to define possible solutions which are assessed.
EP6p/EP6m	All projects require solutions that conform to industry standards.
EP8p/EP8m	A risk management assessment is required in the initial stages of the project to define strategies for dealing with uncertainty.
EA1m	Projects require the application of engineering principles to design solutions and undertake critical analysis of these solutions or results.
EA2m	Projects involve a degree of design or system evaluation through analytical methods and/or modelling.