ES9ZN-15 Research Methods and Professional Skills

22/23

Department
School of Engineering
Level
Taught Postgraduate Level
Module leader
Mohammad Al-Amin
Credit value
15
Module duration
10 weeks
Assessment
100% coursework
Study location
University of Warwick main campus, Coventry

Description

Introductory description

Research Methods and Professional Skills

Module aims

The module aims to equip students with the research skills necessary to support masters' level learning in engineering and facilitate engagement with the individual project through equipping students with a broad research skill set.
In addition, this module will provide students with the professional and team skills to support the course and their career in engineering.

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.

Research Methods:
Matlab and quantitative methods

Experimental and computational research methods
Qualitative research methods

Professional Skills:
regulatory requirements including IPR and codes of practice, industry/sector standards; risk (including health and safety, environmental and commercial); industry/commercial constraints; sustainability; ethics, diversity, cultural, societal considerations
team roles and personal responsibility
ethics
project management
communication methods
Careers guidance

Learning outcomes

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

- 1. Apply appropriate criteria and techniques to critically evaluate current and emerging research/technology in a chosen field and develop a masters level research proposal for an individual project.
- 2. Evaluate: regulatory requirements including IPR and codes of practice, industry/sector standards; risk (including health and safety, environmental and commercial); industry/commercial constraints; sustainability; ethics, diversity, cultural, societal considerations; in order to manage their contribution and impact on an individual research proposal.
- 3. Appraise a range of research methods and justify the most appropriate to solve an individual research problem.
- 4. Assess roles and responsibilities required within an engineering team and hence evaluate own skills and contribution to a team, with consideration of the effectiveness of own and team performance including initiative, personal responsibility and team culture.
- 5. Critically evaluate different approaches to project management, and identify and justify a suitable approach for a given scenario.
- 6. Communicate using a range of techniques on complex engineering matters, with technical and non-technical audiences, and evaluate the effectiveness of the methods used.

Research element

Contributes to the module ES97N through the understanding of research methods and development of a project proposal.

Subject specific skills

1. Ability to seek to achieve sustainable solutions to problems and have strategies for being creative and innovative
2. Ability to be risk, cost and value-conscious, and aware of their ethical, social, cultural, environmental, health and safety, and wider professional engineering responsibilities
3. Knowledge and understanding of the need for a high level of professional and ethical conduct in engineering and the use of technical literature, other information sources

including appropriate codes of practice and industry standards
4. 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. Apply problem solving skills, information retrieval, and the effective use of general IT facilities
2. Communicate (written and oral; to technical and non-technical audiences) and work with others
3. Plan self-learning and improve performance, as the foundation for lifelong learning/CPD
4. Exercise initiative and personal responsibility, including time management, which may be as a team member or leader
5. Awareness of the nature of business and enterprise in the creation of economic and social value
6. Overcome difficulties by employing skills, knowledge and understanding in a flexible manner
7. Appreciation of the global dimensions of engineering, commerce and communication
8. 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	20 sessions of 1 hour (13%)
Seminars	3 sessions of 1 hour (2%)
Tutorials	(0%)
Practical classes	(0%)
Supervised practical classes	4 sessions of 2 hours (5%)
Private study	119 hours (79%)
Total	150 hours

Private study description

Private study will consist of work required to plan the project and investigate the research methods.
Additional study will be required to support the group communication review and individual evaluation of teamwork.

Costs

No further costs have been identified for this module.

Assessment

You must pass all assessment components to pass the module.

Assessment group A2

	Weighting	Study time
Individual Project Research Proposal	60%	
Individual Project Research Proposal including, Project Management Plan and Research Methods plan. 15 pages.		
Group Communication Review (peer assessed) and Teamwork Reflective Evaluation	30%	
Communication Methods critique (group exercise) (peer assessed) and Individual reflection on teamwork plus evaluation. 4 pages max.		
Online tests	10%	
On-line courses and tests in Ethics, Plagiarism, and Health and Safety		

Feedback on assessment

Written comments and supervisor verbal feedback on research proposal
Group feedback on Communication methods exercise
Individual written and cohort feedback on Teamwork evaluation
Student support through advertised advice and feedback hours.

Availability

Courses

This module is Core for:

- Year 1 of TESA-H341 Postgraduate Taught Advanced Mechanical Engineering
- Year 1 of TESA-H641 Postgraduate Taught Communications and Information Engineering
- Year 1 of TESA-H643 Postgraduate Taught Electrical Power Engineering
- Year 1 of TESA-H642 Postgraduate Taught Energy and Power Engineering
- Year 1 of TESA-H1A0 Postgraduate Taught Sustainable Energy Technologies