



Module Specification

Engineering Research

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Part 1: Information

Module title: Engineering Research

Module code: UFMFRS-15-2

Level: Level 5

For implementation from: 2023-24

UWE credit rating: 15

ECTS credit rating: 7.5

Faculty: Faculty of Environment & Technology

Department: FET Dept of Engineering Design & Mathematics

Partner institutions: None

Field: Engineering, Design and Mathematics

Module type: Module

Pre-requisites: None

Excluded combinations: None

Co-requisites: None

Continuing professional development: No

Professional, statutory or regulatory body requirements: None

Part 2: Description

Overview: This module will prepare students to be able to effectively plan and manage an extensive piece of academic research that involves the use of physical and/or computing resources. A series of lectures and seminars will introduce topics such as effective project planning, academic literature review, ethics, data analysis, technical resources, requirements, identifying a suitable topic etc. Some of these areas will have been introduced in earlier modules and in this module will be built

upon to produce a detailed research proposal that could be used for the level 6 individual project.

Features: Not applicable

Educational aims: The aim of this module is to develop engineering and technology research skills and practice including the development of a feasible research proposal that could be implemented as a level 6 dissertation.

Outline syllabus: This module is designed to introduce students to various approaches to research methodology in an engineering and technology environment. It will develop the ability to formulate research proposals, select appropriate methods of analysis and prepare and present research outcomes. Key topics covered include:
The Research Process: theory and practical implications including action and case study research

Ethical considerations for engineers undertaking research

Risk assessment and management, planning and budgeting

The research proposal, research strategy and project plan

Search techniques, literature abstraction and the preparation of a literature review

Issues of reliability, validity and generalisability for researchers

Features of Qualitative and Quantitative data

Collection of primary data: experimental design, survey methods, sampling design and procedure

Analysis of quantitative data: an overview of statistical procedures

Use of secondary data in the research process

Collection and analysis of qualitative data: interviewing and observation methods

Communicating results effectively: dissertation structure and presentation

Understanding plagiarism, copyright and intellectual property

Preparation of a research proposal.

Part 3: Teaching and learning methods

Teaching and learning methods: The module will be delivered to promote discussion and active engagement with the material. The module material will be delivered with a combination of lectures, small group seminars and on-line materials.

The module will involve a substantial element of independent research and learning.

A project week will be used to bring students, academic and technical staff together and provide an environment for students to discuss and plan their final year dissertation. Students will work in small groups to scope out project ideas leading to an individual short presentation of an outline project proposal which will be later submitted as a detailed proposal.

Module Learning outcomes: On successful completion of this module students will achieve the following learning outcomes.

MO1 Develop a coherent, evidenced and feasible project proposal that contains a clearly defined engineering research question that may be applicable to real world application or academic research.

MO2 Develop an effective project plan, identifying risk factors and resource requirements and constraints

MO3 Identify and critically evaluate relevant literature to support the proposed research project.

MO4 Identify and evaluate ethical, societal, legal, financial and environmental issues in the context of the proposed research.

Hours to be allocated: 150

Contact hours:

Independent study/self-guided study = 126 hours

Face-to-face learning = 24 hours

Total = 150

Reading list: The reading list for this module can be accessed at [readinglists.uwe.ac.uk](https://uwe.rl.talis.com/lists/98BA8807-511B-D04B-9E03-9F44F463C2AF.html) via the following link <https://uwe.rl.talis.com/lists/98BA8807-511B-D04B-9E03-9F44F463C2AF.html>

Part 4: Assessment

Assessment strategy: The assessment strategy is designed to support students as they develop a detailed project proposal that identifies a clear research question, contains an initial literature review, considers ethical, resource and professional considerations, IP, security, details an achievable project plan, identifies the academic knowledge and skills required for the completion of the proposed project including new knowledge that student will need to acquire and a reflection on the project development process.

Formative assessment tasks will be set to provide feedback throughout the module to support students preparing their project proposal.

At the start of the module students complete a library workbook to support effective access to databases and other sources to support research based activities and literature review worth 5% of the final mark.

In the project week for teaching block 2, students will work in small groups to scope out project ideas and will be able to interact with academics and technicians in the development of their project ideas. During the project week, students will make a short individual presentation pitch of their project ideas worth 20% of the final mark.

Following the project week, students will use the comments from their presentation to produce a detailed written individual project proposal. This proposal will make up the remaining 75% of the project mark.

The resit strategy will involve students submitting a reworking of the project proposal and a review presentation.

Assessment tasks:

Practical Skills Assessment (First Sit)

Description: Library workbook

Weighting: 5 %

Final assessment: No

Group work: No

Learning outcomes tested: MO3

Report (First Sit)

Description: Project Proposal (2500 words)

Weighting: 75 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Presentation (First Sit)

Description: Project proposal pitch (10 mins)

Weighting: 20 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO3, MO4

Practical Skills Assessment (Resit)

Description: Library workbook

Weighting: 5 %

Final assessment: No

Group work: No

Learning outcomes tested:

Report (Resit)

Description: Project Proposal (2500 words)

Weighting: 75 %

Final assessment: Yes

Group work: No

Learning outcomes tested: MO1, MO2, MO3, MO4

Presentation (Resit)

Description: Short presentation on reflection of project proposal and plan (10 mins).

Weighting: 20 %

Final assessment: No

Group work: No

Learning outcomes tested: MO1, MO3, MO4

Part 5: Contributes towards

This module contributes towards the following programmes of study:

Mechanical Engineering [Frenchay] BEng (Hons) 2022-23

Aerospace Engineering with Pilot Studies [Frenchay] BEng (Hons) 2022-23

Aerospace Engineering with Pilot Studies [Frenchay] MEng 2022-23

Automotive Engineering [Frenchay] BEng (Hons) 2022-23

Automotive Engineering [Frenchay] MEng 2022-23

Mechanical Engineering [Frenchay] MEng 2022-23

Aerospace Engineering [Frenchay] MEng 2022-23

Aerospace Engineering [Frenchay] BEng (Hons) 2022-23

Electronic Engineering [Frenchay] BEng (Hons) 2022-23

Electronic and Computer Engineering [Frenchay] BEng (Hons) 2022-23

Robotics [Frenchay] BEng (Hons) 2022-23

Aerospace Engineering {Apprenticeship-UWE} [Sep][FT][UCW][4yrs] BEng (Hons)
2021-22

Mechanical Engineering {Foundation}[Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-
22

Aerospace Engineering {Apprenticeship-UCW} [Sep][FT][UCW][4yrs] BEng (Hons)
2021-22

Aerospace Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-
22

Mechanical Engineering {Foundation}[Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-
22

Mechanical Engineering {Apprenticeship-UCW} [Sep][FT][UCW][3yrs] FdSc 2021-22

Aerospace Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-22

Aerospace Engineering with Pilot Studies {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-22

Aerospace Engineering with Pilot Studies {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Automotive Engineering {Foundation}[Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Automotive Engineering {Foundation}[Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-22

Electronic Engineering {Foundation} [Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-22

Electronic Engineering {Foundation} [Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Electronic and Computer Engineering {Apprenticeship-GLOSCOLL} [Sep][FT][GlosColl][5yrs] BEng (Hons) 2021-22

Electronic and Computer Engineering [Sep][PT][GlosColl][5yrs] BEng (Hons) 2021-22

Robotics {Foundation}[Sep][SW][Frenchay][5yrs] BEng (Hons) 2021-22

Robotics {Foundation}[Sep][FT][Frenchay][4yrs] BEng (Hons) 2021-22

Mechanical Engineering with Manufacturing {Apprenticeship-UWE} [Sep][FT][UCW][4yrs] BEng (Hons) 2021-22

Mechanical Engineering with Manufacturing {Apprenticeship-UWE} [Sep][FT][COBC][4yrs] BEng (Hons) 2021-22

Mechanical Engineering {Apprenticeship-UCS} [Sep][FT][UCS][3yrs] FdSc 2021-22

Mechanical Engineering {Apprenticeship-GlosColl} [Sep][FT][GlosColl][3yrs] FdSc 2021-22

Mechatronics {Apprenticeship-UCW} [Sep][FT][UCW][3yrs] FdSc 2021-22

Electronic Engineering [Sep][PT][Frenchay][6yrs] BEng (Hons) 2020-21

Aerospace Engineering {Apprenticeship-UCW} [Sep][FT][UCW][5yrs] BEng (Hons)
2020-21

Mechanical Engineering [Sep][PT][Frenchay][7yrs] MEng 2020-21

Mechanical Engineering [Sep][PT][Frenchay][6yrs] BEng (Hons) 2020-21