UNIVERSITY of BRADFORD

# Module Descriptor

| Module Details | |
|---|---|
| **Module Title:** | Research Methods and Skills |
| **Module Code:** | ELE7008-B |
| **Academic Year:** | 2019-20 |
| **Credit Rating:** | 20 |
| **School:** | Department of Biomedical and Electronics Engineering |
| **Subject Area:** | Electrical Engineering |
| **FHEQ Level:** | FHEQ Level 7 (Masters) |
| **Pre-requisites:** | |
| **Co-requisites:** | |

| Contact Hours | |
|---|---|
| **Type** | **Hours** |
| Seminar | 12 |
| Practical classes and workshops | 24 |
| Tutorials | 12 |
| Directed Study | 152 |

| Availability | |
|---|---|
| **Occurrence** | **Location / Period** |
| BDA | University of Bradford / Semester 2 (Feb - May) |

## Module Aims

1.To equip the student with state-of-the-art, up-to-date information that could form the basis for future research and development programmes.

2.To expose the student to the stages involved in making a detailed proposal for a research project and the research, preparation and presentation of a research paper.

3.Enable students to gain and enhance the Matlab, MathsCAD and programming skills required for an MSc Project

## Outline Syllabus

1. The seminar series will provide state-of-the-art presentations that go beyond what is normally delivered in taught modules.

2. The workshop event will provide the opportunity to produce an academic paper in a relevant subject and to present the results in a workshop environment. Here, the emphasis shall be on demonstrating an understanding of the processes involved in preparing and subsequently presenting a technical paper. This will involve research using library and web facilities.

3. The portfolio of evidence of personal development of research skills will be developed through a series of seminars on research skills and practical sessions developing MATLAB programming skills, using worksheets and programming challenges.

## Learning Outcomes

| | |
|---|---|
| 1 | Demonstrate a critical understanding of the latest state-of-the-art concepts in your chosen topic of study |
| 2 | Demonstrate a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline |
| 3 | Understand the processes and requirements of developing a project plan and evaluate the potential ethical, sustainability and safety issues that could arise from a project |
| 4 | Critically appraise an engineering problem, model the problem in an advanced programming language such as Matlab and be able to interpret and validate the results |
| 5 | Produce a technical, research-oriented paper based on knowledge gained through the seminar series and through research into the subject |
| 6 | Assimilate and interpret information |
| 7 | Present and communicate information to an informed audience in written and oral formats |
| 8 | Demonstrate an independent learning ability required for continuing professional development |

## Learning, Teaching and Assessment Strategy

The Research Seminar part of this module will comprise a series of regular, hour-long seminars, presented by invited leading experts from industry and academia, with the aims of broadening understanding outside of the normal realms of study and to highlight good practice.

The ability to work cooperatively with others to achieve a common goal, perform research into a chosen topic and to assimilate and articulate the results will be assessed through the organisation of a group workshop on a research area of current interest at which each group member will present an individual paper covering a different aspect of the research area. Individual abstracts will be prepared for formative feedback.

The Research Skills part of the module will comprise a series of workshops and practical sessions covering different aspects of research skills including: intellectual property and plagiarism, ethics, health and safety and sustainability, library sessions, citation and referencing, writing clear aims and objectives, project planning; use of MATLAB as a numerical and symbolic

tool and as a programming language. This will be assessed through presentation of a portfolio of personal development evidence.

Both formal and summative assessments are used to assess learning outcomes:
Formative assessment:
- Peer reviewed presentation prior to the assessed
oral presentation
Summative assessements:
- A 3000-word academic paper
- A portfolio of evidence research skills
- A 20-min oral presentation

PSRB requirements:
LO1: SM1fl, D1fl, EP2fl
LO2: EP1i,D1fl
LO3: D2fl, ET1fl, ET2fl
LO4: EA1fl, EA2fl, EA3fl
LO5: SM3fl, D2fl, D3fl
LO6: EA3fl, D1fl

## Mode of Assessment

| Type | Method | Description | Length | Weighting |
|---|---|---|---|---|
| Summative | Presentation | Oral presentation | 20 minutes | 25% |
| Formative | Presentation | Peer-reviewed presentation | 20 minutes | % |
| Summative | Coursework | Portfolio of evidence research skills | | 25% |
| Summative | Coursework | 3000 word equivalent academic paper | -3000 words | 50% |

## Reading List

To access the reading list for this module, please visit https://bradford.rl.talis.com/index.html.

*Please note:*

*This module descriptor has been published in advance of the academic year to which it applies. Every effort has been made to ensure that the information is accurate at the time of publication, but minor changes may occur given the interval between publishing and commencement of teaching. Upon commencement of the module, students will receive a handbook with further detail about the module and any changes will be discussed and/or communicated at this point.*