### Course Details

**Course Code:** B81EZ  
**Full Course Title:** Critical Analysis and Research Preparation  
**SCQF Level:** 11  
**SCAF Credits:** 15  
**Available as Elective:** No

### Delivery Level

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<th>Postgraduate Taught</th>
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<th>Postgraduate Research</th>
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### Additional Information:

### Course Aims

To prepare students for carrying out an extended SQCF Level 11 research or development project in a science or engineering programme by developing their skills in critical thinking, research planning and management, academic writing, experimental design and data handling.

### Learning Outcomes – Subject Mastery

For the core science/engineering area that is the subject of the project preparation work, the student should demonstrate:

- a knowledge and understanding of the subject's scope, terminology and conventions
- a critical understanding of the subject's principal theories, principles and concepts, and of certain specialist topics within these
- an extensive, detailed and critical knowledge and understanding that is informed by developments at the forefront of the subject
- a critical awareness of current issues in the subject
- Apply critical analysis, evaluation and synthesis to issues which are at the forefront or informed by developments at the forefront of a subject/discipline.
- Identify, conceptualise and define new and abstract problems and issues.
- Develop original and creative responses to problems and issues.
- Critically review, consolidate and extend knowledge, skills practices and thinking in a subject/discipline.
- Deal with complex issues and make judgments relevant to the design of his/her own research in the absence of complete or consistent data/information.

For the core science/engineering area that is the subject of the project preparation work, the student should demonstrate the ability to:

- Apply a range of standard and specialised research enquiry techniques, evidenced by a detailed literature review of the relevant subject area
- Plan a significant project of research, investigation or development, as evidenced in a written project proposal and plan
- Demonstrate originality or creativity in interpreting prior work in the subject and applying this to the design of his/her own research project

### Learning Outcomes – Personal Abilities
The student should,

- Deal with complex professional issues and make informed judgments on issues not addressed by current professional and/or practices.
- Demonstrate an awareness of the application of his/her work in an industrial and/or commercial context.

The student should,

- Exercise substantial autonomy and initiative in planning and managing his/her research.
- Take responsibility for his/her work and for interaction with others.
- Take responsibility for accessing and using significant range of resources including literature, electronic documents and software/computational resources.
- Demonstrate initiative by making an identifiable contribution to planning his/her research.
- Exercise critical reflection on his/her own and others' roles and responsibilities.

The student should be able to use a range of advanced and specialised skills as appropriate to the subject of the project preparation work, including:

- written communication in the form of a project proposal, literature review and detailed project plan.
- dialogue with other students, researchers and academic staff.
- making effective use of software to prepare written work and to collect and/or manipulate data.
- undertake critical evaluations of a wide range of written, numerical and graphical information.

SYLLABUS

- Planning a research/development project

Defining measurable and realistic aims; planning the structure of your project; time-management; defining a reporting/review schedule; milestone setting; writing a Gantt chart.

- Getting the most from your supervisor

Preparing for review meetings; communication skills; reviewing and evaluating your progress and results; keeping a record of your progress.

- Background research

Carrying out a literature review; electronic bibliographic databases; online journals; using the library; how to reference other work.
B81EZ Critical Analysis and Research Preparation

- **Academic writing**

  Writing techniques; plagiarism and how to avoid it; structuring a dissertation; reviewing your own writing

- **Data analysis and presentation**

  Statistical techniques including regression and error analysis; recommended software; examples of good and bad practice; effective presentation of data

### COURSE RELATIONSHIPS

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