1. **Title of the module**

EL849 Research Methods and Project Design

1. **School or partner institution which will be responsible for management of the module**

Engineering and Digital Arts

1. **The level of the module (Level 4, Level 5, Level 6 or Level 7)**

7

1. **The number of credits and the ECTS value which the module represents**

30 (15 ECTS)

1. **Which term(s) the module is to be taught in (or other teaching pattern)**

Autumn, Spring (mainly Spring)

1. **Prerequisite and co-requisite modules**

None

1. **The programmes of study to which the module contributes**

MSc/PGDip in Advanced Digital Systems Engineering (and variants)

MSc/PGDip in Advanced Communications Engineering (and variants)

MSc/PGDip in Advanced Electronic Systems Engineering

MSc/PGDip in Information Security and Biometrics

1. **The intended subject specific learning outcomes.  
   On successfully completing the module students will be able to:**
   1. identify the current status of a particular research area and define the state-of-art in the area
   2. identify and formulate further research which could usefully be undertaken in a defined area of technology
   3. plan an individual and group research project, including the definition of objectives, project management, experimental design and data collection and processing within time and resource constraints, regulatory requirements and the need for sustainability
   4. undertake research using logical and effective methodologies, taking into account issues regarding IPRs and research ethics
   5. communicate with peers by way of verbal presentation and scientific writing
   6. understand team dynamics and roles in engineering projects and plan accordingly
2. **The intended generic learning outcomes.  
   On successfully completing the module students will be able to:**
   1. show an ability to deal with complex issues systematically and creatively and make judgements in the absence of complete data, and show that they are capable of self-direction and problem solving.
   2. Demonstrate the ability to use and understand a range of modern CAD tools and general ICT.
   3. Demonstrate the ability to communicate complex ideas and concepts to specialist and non-specialist audiences.
   4. Show that they are capable of learning independently, use critical thinking and analysis and demonstrate autonomy in time and resource management
3. **A synopsis of the curriculum**

The module will equip students with research skills required to carry out engineering projects in a group and individual settings. These skills include programming and system modelling, academic writing and literature review, presentation skills, project management and group work, as well as IPR and research ethics issues in engineering contexts.

1. **Reading list (Indicative list, current at time of publication. Reading lists will be published annually)**

* BERENDSEN, Herman J. C., 2011. A student’s guide to data and error analysis. Cambridge: Cambridge University Press. ISBN 0521119405.
* CARGILL, Margaret and O’CONNOR, Patrick, 2009. Writing scientific research articles: strategies and steps. Oxford: Wiley-Blackwell. ISBN 1444312049..
* DAY, Robert A. and DAY, Nancy, Scientific English: a guide for scientists and other professionals. Santa Barbara, Calif: Greenwood. ISBN 9780313391736.
* DAY, Robert A. and GASTEL, Barbara, How to write and publish a scientific paper. Santa Barbara, Calif: Greenwood. ISBN 9780313391972.
* GREENFIELD, Tony, Research methods for postgraduates. London: Arnold. ISBN 0340806567.
* ZANDERS, Edward D. and MACLEOD, Lindsay, 2010. Presentation skills for scientists: a practical guide. Cambridge: Cambridge University Press. ISBN 9780521741033.
* Royal Academy of Engineering *“Creating Systems That Work – principles of engineering for the 21st century”*

1. **Learning and teaching methods**

Contact hours: 39

Private Study hours: 261

Total hours: 300.

1. **Assessment methods**
   1. Main assessment methods

The module is assessed by means of 100% coursework:

15% Group Project Presentation (plan)

35% Group Project Report

45% - MSc Project Proposal (including literature review as a single report)

5 % - Poster Design

13.2 Reassessment methods

Like for like

1. ***Map of module learning outcomes (sections 8 & 9) to learning and teaching methods (section12) and methods of assessment (section 13)***

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Module learning outcome** |  | *8.1* | *8.2* | *8.3* | *8.4* | *8.5* | *8.6* | *9.1* | *9.2* | *9.3* | *9.4* |
| **Private Study** | 261 | **x** | **x** | **x** | **x** | **x** |  |  |  | **x** | **x** |
| *Lectures* | 22 | **x** | **x** | **x** | **x** | **x** | **x** |  |  |  | **x** |
| *Laboratory workshops* | 12 |  |  |  | **x** |  |  | **x** | **x** | **x** | **x** |
| *Presentation sessions* | *5* | **x** | **x** |  |  |  | **x** | **x** | **x** | **x** | **x** |
| **Assessment method** |  |  |  |  |  |  |  |  |  |  |  |
| *Group project report* |  | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| *Group project presentation* |  | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** | **x** |
| *Full MSc project proposal (including literature review)* |  | **x** | **x** | **x** | **x** | **x** |  | **x** | **x** | **x** | **x** |
| *Poster Design* |  | **x** | **x** | **x** |  | **x** |  | **x** | **x** | **x** | **x** |

1. **Inclusive module design**

The School recognises and has embedded the expectations of current equality legislation, by ensuring that the module is as accessible as possible by design. Additional alternative arrangements for students with Inclusive Learning Plans (ILPs)/declared disabilities will be made on an individual basis, in consultation with the relevant policies and support services.

The inclusive practices in the guidance (see Annex B Appendix A) have been considered in order to support all students in the following areas:

a) Accessible resources and curriculum

b) Learning, teaching and assessment methods

1. **Campus(es) or centre(s) where module will be delivered**

Canterbury

1. **Internationalisation**

Consideration is made of international research and researchers, publication in international journals and conferences and the range of international patents and patent bodies.

**FACULTIES SUPPORT OFFICE USE ONLY**

**Revision record – all revisions must be recorded in the grid and full details of the change retained in the appropriate committee records.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Date approved | Major/minor revision | Start date of delivery of revised version | Section revised | Impacts PLOs (Q6&7 cover sheet) |
| 03/12/2019 | Minor | September 2020 | 8, 14 | No |
|  |  |  |  |  |