2024 / 25

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Ollscoil Teicneolaíochta an Oirdheiscirt

South East Technological University

Module Descriptor

Research Methods and Dissertation Proposal (Computing and Mathematics)

Research Methods and Dissertation Proposal (A14031)

Short Title: Res. Methods & Diss Proposal
Department: Computing and Mathematics
Credits: 10 **Level:** Postgraduate

Description of Module / Aims

This subject is a formal induction into the research process. It provides a general overview of important concepts, methodologies and an introduction to practical methods associated with carrying out independent research in computing and information systems related topics. This course is designed to provide an understanding of the scientific research process. It also provides a practical support for students who are beginning their postgraduate research activities. Research in computing-related fields is one of the most inter-disciplinary and complex areas of academic activity ranging from highly technical studies to research on systems development methodologies to analysis of user experiences to large-scale systems integration and many other areas. This module therefore reflects the rich tradition of interdisciplinary and single disciplinary published research in the Department of Computing and Mathematics.

Programmes

		stage/semester/status
RESA-0175	MSc in Computer Science (Enterprise Software Systems) (WD_KCESS_R)	1 / 0 / E
RESA-0175	MSc in Computing (Information Systems Processes) (WD_KISYP_R)	1 / 0 / E

Indicative Content

- Overview of the classical scientific research process, introduction to important ideas in the philosophy of science
- Topic selection, problem formulation, setting out research study objectives, formulating different types of research questions, qualities of well-focused RQs
- Critiquing the academic literature: features and sources of academic publications, preparing the literature survey & review, referencing styles and conventions, the relationship between the literature review and research questions, the relationship between the literature review and theory development, important sources and types of academic publication, reviewing criteria for academic publications
- Theory formulation: concepts & variables, propositions and hypotheses, building theoretical frameworks for validation and testing including deductive and inductive reasoning techniques
- Research Design: fixed vs. flexible designs, Overview of Quantitative, Qualitative and Multi-method approaches in computing and experimental design
- Quantitative methods in computing and IS including the principles of quantitative research, statistical inference, procuring data and designing experiments
- Qualitative methods in computing and IS including case study research, principles of data gathering, analysis and interpretation and other methods and their applications in computing and IS
- Ethical issues in computing-related research
- Qualities of a research proposal: Criteria of coherence, comprehensiveness and currency, originality, impact, validity, reliability, generalisability, significance, rigour and related epistemological considerations

Learning Outcomes

On successful completion of this module, a student will be able to:

1. Appraise key research concepts associated with scientific research.
2. Formulate their research problem, research objectives and research questions.
3. Organise a preliminary literature review of the concepts comprising the research questions associated with a topic of research.
4. Formulate original theory for testing and demonstrate clearly how they arise from the literature review and gather data to evaluate their theory through appropriate research method instrumentation alternatives.
5. Prepare and successfully present a mini-dissertation research proposal to a research panel.
6. Prepare and engage in a planned research activity under academic supervision.
7. Collect and analyse quantitative and qualitative data to assist in addressing a research question.

Learning and Teaching Methods

- Lectures, group work, practical sessions and workshops. Engagement with a dedicated, assigned research supervisor.
- Module delivery will combine workshop oriented approach with the presentation of theoretical material. It is designed to engage students in the work of preparing their research dissertation proposal and supporting engagement with supervisors and research planning.
- Continuous assessment of this module is by way of a dissertation proposal which comprises a report and presentation.
- This module will enable students to initiate and progress work on their dissertation proposal and presentation during the workshops.
- Indicative Dissertation Proposal Report Structure will be provided to students during the delivery of this module.The student will also make an oral presentation of the proposal to a research panel organised by the relevant course board.
- This proposal will be assessed using a dissertation proposal assessment form which will be reviewed during the module delivery. The assessment process will involve a first reader (the assigned supervisor) and a second reader.

Learning Modes

Learning Type	F/T Hours	P/T Hours
Lecture	36	36
Practical	12	12
Independent Learning	222	222

Assessment Methods

	Weighting	Outcomes Assessed
Continuous Assessment	100%	
Assignment	50%	2,3,4,5,6,7
Assignment	50%	1,3,4

Assessment Criteria

<40%: Unable to interpret and describe key concepts associated with academic research. Unclear or entirely inadequate presentation of proposed research. Proposal not workable.

40%–59%: Be able to interpret and describe key concepts of scientific research. Some clarity in the research proposal but may need work to successfully progress their study. Research proposal deemed suitable for further work, with revisions and refocussing. Elementary plans in place which provide a solid basis for further work.

60%–69%: Solid grasp of conceptual material. Demonstrable understanding of and ability to articulate key concepts associated with research. Good quality research proposal and presentation, demonstrating a clear understanding of the domain and how to research it as an independent researcher.

70%–100%: All the above to an excellent level. Demonstrates an ability to analyse and design solutions to a high standard for a research project which clearly demonstrates publishable potential in a computing-related field. Clearly stated and well-worked theory with some appreciation of how to test this theory to a relatively advanced level.

Supplementary Material(s)

- Creswell, J. *Research Design: Quantitative, Qualitative and Mixed Methods Approaches*. 3rd ed.. Thousand Oaks: Sage, 2009.
- Denzin, N. and Y. Lincoln. *The Handbook of Qualitative Research*. Thousand Oaks: Sage, 2000.
- Field, A. *Discovering Statistics using SPSS*. 3rd ed.. Thousand Oaks: Sage, 2009.
- Gardiner, W.P. and G. Gettinby, G. *Experimental Design Techniques in Statistical Practice*. New Delhi: Woodhead Publishing, 2013.
- Grey, D. *Doing Research in the Real World*. Thousand Oaks: Sage, 2009.
- Murray, R. *How to Write a Thesis*. Bucks, UK.: Open University, 2002.
- Pallant, J. *The SPSS Survival Manual*. Bucks, UK.: Open University, 2002.
- Robson, C. *Real World Research*. 3rd ed.. MA, USA: Blackwell, 2003.

Requested Resources

- Room Type: Computer Lab