

Full Title	Research Skills for Engineers		
Status	Draft	Start Term	2020
NFQ Level	08	ECTS Credits	20
Module Code	CIVE08075	Duration	Stage - (26 Weeks)
Grading Mode	Numeric	Department	Building & Civil Engineering
Module Author	Shane Newell		
Co Authors	Mark Kelly		

Module Description

This module provides an opportunity to the student to learn about research methods, develop a research proposal, and develop the skills to critically assess academic and/or professional literature. This endeavour will require critical assessment and evaluation of sources, and will equip students to complete an academic research paper in their particular field or topic.

Learning Outcomes

On completion of this module the learner will/should be able to:

- Analyse and evaluate in detail the issues associated with a particular work-based project.
- Identify, analyse and evaluate appropriate research methods for research project proposal development.
- Develop a research proposal and undertake necessary research.
- Critically analyse and evaluate current literature, using appropriate tools and techniques.
- Demonstrate the synthesis and integration of knowledge.
- Produce an academic research paper.

Indicative Syllabus

The project involves the specification and analysis of a 'work-based problem'. The problem will involve primary and/or secondary research. Although the student may focus on a specific design or technical project, their work must show an appropriate level of academic research, rigour, analysis, investigation and implementation. The output of the module will be a research proposal and an academic paper. The student will work through some or all of the following activities:

- Introduction to academic research
- Development of project specification and scope
- Research design and proposal development
- Literature review
- Development of research sources, narrowing of research scope
- Field/practical/laboratory research and development work
- Analysis of research results
- Conclusions and recommendations
- Structure and academic writing

The proposed word count for the research paper will be in the region of 6,000 words.

Workshop 1 – Introduction to Research Project, Time Management, Moving from an idea to a Research Proposal, Library Session on the Introduction to GMIT Resources and Undertaking a Literature Review.

Workshop 2 – Research Proposal Reviews and Feedback, Introducing Research Methodologies, Library Session on Referencing and Endnote, Research Paper Outline and Structure

Workshop 3 – Critical reevaluation of research methodologies – breakout groups undertaking activities depending on methodologies selected i.e. case studies, questionnaires, interviews etc.

Workshop 4 – Critical evaluation of work done to date with a focus on academic writing, structure, format and outline of paper.

Teaching and Learning Strategy

Blended Learning Strategy

The blended teaching and learning strategy for the module aims to create a flexible and accessible learning environment for students. A combination of participative face-to-face interactive workshops and innovative online resources will inform a learner-centred and subject-led approach to all elements of the module.

The module is structured such that the learner can attend the workshops or access the workshop resources online.

Assessment Strategy

The Research Skills blended assessment strategy will employ both formative and summative face-to-face and online assessment approaches (critical reflection, research proposal and academic papers), which clearly focus on individual learning reinforcement, collaborative learning and industry-relevant competences. The assigned authentic assessments tasks will be clearly aligned with in-class and online activities and their associated learning outcomes.

The assessment details for blended delivery are outlined below:

Type	Title	Form	%	Week	LO
CA	Critical Reflection (3No.)	Project	15	9	1-3
CA	Research Project Proposal	Project	15	13	1-3
CA	Academic Paper	Project	70	26	1, 4-6

Repeat Assessment Strategies

The student will be required to resubmit the academic paper following detailed feedback in relation to original submission

Indicative Coursework and Continuous Assessment:		100 %		
Form	Title	Percent	Week (Indicative)	Learning Outcomes
Written Report	Critical Reflection (3No.)	15 %	OnGoing	1,2,3
Written Report	Research Proposal	15 %	Week 13	1,2,3
Written Report	Research Paper	70 %	Week 26	1,4,5,6

Full Time Delivery Mode Average Weekly Workload:		0.50 Hours			
Type	Description	Location	Hours	Frequency	Weekly Avg
Supervision	Supervision (0.5hr/week)	Not Specified	0.5	Weekly	0.50

Online Learning Delivery Mode Average Weekly Workload:		0.58 Hours			
Type	Description	Location	Hours	Frequency	Weekly Avg
Online Learning	4 Unit Research Design & Methodologies (Week 0-9)	Online	15	Once Per Module	0.58

Blended Delivery Mode Average Weekly Workload:		0.46 Hours			
Type	Description	Location	Hours	Frequency	Weekly Avg
Seminar	Workshops (4No.)	Flat Classroom	12	Once Per Module	0.46

Independent Learning	Research paper development	Not Specified	2	Weekly	2.00
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Required Reading Book List

Naoum, G., (2012). *Dissertation Research and Writing for Construction Students*. Routledge.
ISBN 9780415538442 ISBN-13 0415538440

Cottrell, S., (2017). *Critical Thinking Skills*. Red Globe Press.
ISBN 1137550503 ISBN-13 9781137550507

Farrell, P., (2016). *Writing Built Environment Dissertations and Projects*. John Wiley & Sons.
ISBN 9781118921920 ISBN-13 1118921925

van Emden, J., Becker, L., (2017). *Writing for Engineers*. Red Globe Press.
ISBN 1352000474 ISBN-13 9781352000474

Recommended Reading Book List

Fellows, F., , A., (2015). *Research Methods for Construction*. John Wiley & Sons.
ISBN 9781118915745 ISBN-13 1118915747

Journal Resources

Examples of journal research papers will be provided to students.

Online Resources

Online resources will be provided to students on Moodle.

<https://library.gmit.ie/support/academic-writing-centre/>

<https://www-citethemrightonline-com.ezproxy.gmit.ie/>

https://owl.purdue.edu/owl/purdue_owl.html

<https://www.monash.edu/rlo>

Programme Membership