GMIT
INSTITIÚID TEICNEOLAÍOCHTA NA GAILLIMHE-MAIGH EO
GALWAY-MAYO INSTITUTE OF TECHNOLOGY

COMP08033
Computational Thinking with Algorithms

Full Title	Computational Thinking with Algorithms		
Status	Uploaded to Banner	**Start Term**	2017
NFQ Level	08	**ECTS Credits**	05
Module Code	COMP08033	**Duration**	13 weeks - (13 Weeks)
Grading Mode		**Department**	Comp Science & Applied Physics
Module Author	Ian McLoughlin		

Module Description

A comprehensive grounding in solving computational problems and designing algorithms.

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

1. Apply structured methodologies to problem solving in computing.

2. Design algorithms to solve computational problems.

3. Critically evaluate and assess the performance of algorithms.

4. Translate real-world problems into computational problems.

Indicative Syllabus

Computational Thinking

- Understanding and describing problems
- Modelling real-world problems
- Abstraction and experimentation
- Undecidable problems

Algorithm design

- Searching
- Sorting
- Data structures
- Flow diagrams

Analysis of Algorithms

- Sizing a problem
- Rates of growth
- Best, average and worst cases
- Benchmarks

Using the literature

- Accessing the literature
- Reading the work of others
- Writing literature

Teaching and Learning Strategy

A combination of lectures and practical sessions will be provided.

Assessment Strategy

Students will be assessed through a combination of assignments and projects.

Repeat Assessment Strategies

A large project will be provided covering all learning outcomes.

Indicative Coursework and Continuous Assessment:		100 %		
Form	*Title*	*Percent*	*Week (Indicative)*	*Learning Outcomes*
Written Report	Report	40 %	Week 6	1,2,3,4
Project	Project	60 %	Week 13	1,2,3,4

Full Time Delivery Mode Average Weekly Workload:			4.00 Hours		
Type	*Description*	*Location*	*Hours*	*Frequency*	*Weekly Avg*
Lecture	Lecture	Not Specified	2	Weekly	2.00
Practical	Practical	Not Specified	2	Weekly	2.00

Online Learning Delivery Mode Average Weekly Workload:			4.00 Hours		
Type	*Description*	*Location*	*Hours*	*Frequency*	*Weekly Avg*
Online Learning	Online (Asynchronous)	Not Specified	3	Weekly	3.00
Online Learning	Online (Synchronous)	Not Specified	1	Weekly	1.00

Literary Resources

Algorithmics - The Spirit of Computing - 3rd Edition
David Harel & Yishai Feldman
Springer

Algorithms in a Nutshell
George T. Heineman, Gary Pollice, and Stanley Selkow
O' Reilly

Data Structures and Algorithms in Java - (4th edition)
Michael T. Goodrich and Roberto Tamassia
John Wiley & Sons Inc.

Online Resources

http://csunplugged.org/

Other Resources

None.

Additional Information

None.

Programme Membership

GA_KDATG_L08 201700 Higher Diploma in Science in Data Analytics
GA_KSOFG_L08 201700 Higher Diploma in Science in Software Development