MODULE SPECIFICATION PROFORMA

Module Code:	COM457

Module Title:	Discrete Computational Methods

Level:	4	**Credit Value:**	20

Cost Centre(s):	GACP	HECoS **code**:	100960

Faculty:	Arts, Science and Technology	**Module Leader:**	Bindu Jose

Scheduled learning and teaching hours	48 hrs
Guided independent study	152 hrs
Placement	0 hrs
Module duration (total hours)	200 hrs

Programme(s) in which to be offered (not including exit awards)	Core	Option
BSc (Hons) Computer Science	✓	☐
BSc (Hons) Computer Science (with Industrial Placement)	✓	☐
BSc (Hons) Cyber Security	✓	☐
BSc (Hons) Cyber Security (with Industrial Placement)	✓	☐
BSc (Hons) Applied Cyber Security	✓	☐

Pre-requisites
None.

Office use only
Initial approval: 30/08/2018 Version no:2
With effect from: 01/09/2018
Date and details of revision: Jan 22: Addition of DA programme title Version no:

Module Aims

The module aims to provide students with a grounding in the broad logical and mathematical principles that will support and underpin their future studies in their respective subject discipline. This module will also enable students to apply relevant mathematical methods and techniques to practical problems.

Intended Learning Outcomes

Key skills for employability

KS1	Written, oral and media communication skills
KS2	Leadership, team working and networking skills
KS3	Opportunity, creativity and problem solving skills
KS4	Information technology skills and digital literacy
KS5	Information management skills
KS6	Research skills
KS7	Intercultural and sustainability skills
KS8	Career management skills
KS9	Learning to learn (managing personal and professional development, self-management)
KS10	Numeracy

At the end of this module, students will be able to		Key Skills	
1	Recognize, describe and apply correct mathematical notation	KS1	KS2
		KS3	KS4
		KS5	KS6
2	Express and manipulate mathematical concepts with the necessary rigour.	KS1	KS2
		KS3	KS4
		KS5	
3	Identify and apply appropriate mathematical tools and methods in solving real-life and computing-related problems.	KS1	KS2
		KS3	KS4
		KS5	
4	Appreciate how well-designed simple algorithms can solve complex computational problems	KS1	KS2
		KS3	KS4
		KS5	
5	Solve mathematical problems using appropriate tools/methods/formula/algorithms, decision making and independent thought.	KS1	KS2
		KS3	KS4
		KS5	

Transferable skills and other attributes

- Personal motivation, organisation and time management
- Ability to collaborate and plan
- Written and verbal communication skills
- Research and analytical skills

Derogations

None.

Assessment:

Indicative Assessment Tasks:

The assessment will comprise of two pieces of course work, comprising of exercises and/or larger programs, program design, program listings and evidence of testing will be the main components of the assessments.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting (%)	Duration (if exam)	Word count (or equivalent if appropriate)
1	1, 2, 3, 4,	Coursework	60		1,800
2	5	In-class test	40	1.5 hrs	

Learning and Teaching Strategies:

The module will be delivered through a combination of formal lectures, tutorials, practical demonstrations and labs. Students will have access to lecture materials, and ancillary resources, via the University's VLE platform.

Syllabus outline:

Syllabus outline:

- Types of number and bases
- Units and conversions
- Algebra: representation and manipulation
- Linear algebra: vectors and matrices, linear transformation, solving systems of equations
- Discrete mathematics
- Sets and sequences
- Equalities and inequalities
- Statistics and probability Representing data: charts, graphs and tables Computational Thinking Algorithms Measuring Performance

Indicative Bibliography:

Essential reading

Ferreira Filho, W. (2017). Computer Science Distilled: Learn the Art of Solving Computational Problems. Code Energy.

Other indicative reading

Croft, A. and Davison, R. (2016). Foundation Maths, Sixth Edition. Prentice Hall.

Haggarty, R. (2002). Discrete Mathematics for Computing, Prentice Hall. Lehman, E.,

Leighton, F. T., & Meyer, A. R. (2010). Mathematics for computer science. URL: https://courses.csail.mit.edu/6.042/spring17/mcs.pdf Arora,

S., & Barak, B. (2009). Computational complexity: a modern approach. Cambridge University Press. URL: http://theory.cs.princeton.edu/complexity/book.pdf http://www.purplemath.com/ https://www.mathsisfun.com/