Module Title	**Discrete Mathematics**
Level	4
Reference No.	CSI_4_DMA
Credits	20
Student Study Hours	Total: 200 Contact hours: 52 plus 12 additional support hours (typically one hour per week) Student managed learning hours: 148 (including any additional support)
Pre-Requisites	None
Co-requisites	None
Excluded combinations	None
Module coordinator	TBC
Division	Division of Computer Science and Informatics
Short Description	This module will introduce you to the logical and discrete mathematical structures and models, which are commonly used in the field of Computer Science and which underpin any study of this discipline. The module will emphasise the formulation of problems into mathematical forms, the interpretation of solutions and the identification of problem characteristics to help suggest modelling approaches. Provisions will be made (typically one hour per week) to allow us to bring you, if necessary, to a level of confidence and expertise in those areas of essential basic mathematics that should have been covered at earlier levels.
Aims	This module aims to provide a comprehensive understanding of the discrete mathematics that form the foundations of theoretical Computer Science and to familiarise students with associated techniques. Students should acquire sufficient practical skills to solve practical computing problems and understand the mathematical mechanisms commonly used in both hardware and software artefacts.
Learning Outcomes	**LO1: Knowledge and Understanding** ● Apply a range of mathematical approaches such as graph theory, first-order logic, Boolean algebra and Venn diagrams to a range of IT related problems using valid arguments. ● Simplify and solve a range of equations and select and apply statistical methods appropriately. (Maps to BCS: 2.2.3 a1-a3)) **LO2: Intellectual Skills** ● Select and apply appropriate mathematical frameworks for solving IT related problems. (Maps to: 2.2.3 a1-a3) **LO3: Practical Skills** ● Select and apply a range of mathematical tools and techniques. (Maps to: 2.2.3 a4-a6) **LO4: Transferable Skills** ● Work in a team and present mathematical ideas appropriately to both technical and non-technical audiences. (Maps to: BCS 2.2.1 c1-c2)
Employability	Numeracy is one of the key skills looked for by employers, and one which employers often regard as lacking in many job applicants. This module is thus important in helping you to improve your numeracy skills as well as general problem-solving skills. The new material that you will come across in this module will support you in later studies across the various pathways. This module will help you to enhance your personal development and your employability prospects.
Teaching and Learning Pattern	Lectures and tutorials in groups with one member of the teaching team responsible for the lecture and tutorial time, 6 hours per week, for each group of students. A broken lecture style will be adopted in which new material is interspersed with examples and exercises for students.

Indicative Content	● Graph Theory, Set Theory ● Propositional Logic ● Predicate Logic ● Valid arguments ● Boolean algebra ● Linear equations ● Plotting and interpreting graphs ● Functions and data ● Statistical data collection, analysis and presentation ● Probability ● Correlation and linear regression ● Hypothesis testing and modelling using probability distributions
Assessment:	**COURSEWORK 100%** **Summative Assessment** Coursework: Expected to be individual assessments consisting of in-class phase tests and an assignment requiring the selection, application and interpretation of methods taught during the module and a personal reflection on your learning during the module (LO1-LO4) (Maps to: BCS 2.2.3 a1-a6; BCS 2.2.1 c1-c2) **Formative Assessment** Skills for the summative assessment will be embedded throughout formative opportunities in Lectures and Workshops. Formative assessment will take different forms, such as: ● interactive revision quizzes ● verbal feedback on tutorial activities ● observation and questioning to provide instant feedback as the student takes part in learning activities
Indicative Sources (Reading lists)	**Core:** There is no core textbook defined for this module. Students are expected to refer to the indicative sources below: **Optional:** ● Kwong, H. (2015) *A Spiral Workbook for Discrete Mathematics*, Open SUNY Textbooks. ISBN: 1942341180 ● Hunter, D.J. (2015) *Essentials of Discrete Mathematics*, Jones and Bartlett ● Grossman, P. (2008) *Discrete Mathematics for Computing*, Palgrave Macmillan ● Bush, J. (2003) *Discrete Mathematics Workbook*, Prentice Hall ● Garnier, R. & Taylor, J. (2001) *Discrete Mathematics for New Technology*, Adam Hilger ● Berenson, M. and Levine, D (2009). *Basic Business Statistics*, Pearson Prentice Hall ● Parson, R. and Farber, B (2009). *Elementary Statistics*, Pearson Prentice Hall ● Agresti, A. and Franklin, C. (2009) *Statistics: The Art and Science of Learning from Data*, Pearson Prentice Hall