

**SCHOOL OF ELECTRONIC ENGINEERING**

**AND COMPUTER SCIENCE**

**PROGRAMME DESCRIPTOR 2024-2025**

**BSc Computer Science and Mathematics (3 years): GG41**

**Please note this programme has a compulsory first year module diet and a Core final year Project**

**Year 1 Modules**

**Semester 1**

ECS401U Procedural Programming (15 credits) (pre requisite for ECS505U Software Engineering, ECS522U Graphical User Interfaces, ECS605U Image Processing. ECS610U Computer Graphics)

ECS427U Professional and Research Practice (15 credits)

MTH4300 Introduction to Analysis and Calculus I (30 credits)

MTH4113 Numbers, Sets and Functions (15 credits)

**Semester 2**

ECS414U Object Oriented Programming (15 credits) (pre requisite for ECS605U Image Processing, ECS639U Web Programming, ECS652U Compilers,

ECS657U Multi-platform Game Development, ECS658U Further Object Oriented Programming), ECS652U Compilers

ECS421U Automata and Formal Languages (15 credits) (pre requisite for ECS652U Compilers)

MTH4300 Introduction to Analysis and Calculus I cont (30 credits)

MTH4115 Vectors and Matrices (15 credits)

**Year 2 Modules**

**Semester 3**

ECS505U Software Engineering (15 credits) (pre requisite for ECS506U Software Engineering Project)

MTH4500 Probability and Statistics (30 credits)

MTH5112 Linear Algebra I (15 credits)

**Plus one module from:**

ECS519U Database Systems (15 credits) (pre requisite for ECS671U Semi-Structured Data Engineering)

ECS529U Algorithms and Data Structures (15 credits)

**Semester 4**

ECS506U Software Engineering Project (15 credits) (pre requisite ECS505U)

MTH4500 Probability and Statistics (30 credits)

**Plus one module from**:

ECS518U Operating Systems (15 credits) (pre requisite for ECS642U Embedded Systems)

ECS522U Graphical User Interfaces (15 credits) (pre requisite ECS401U) (pre requisite for ECS661U User Experience Design)

ECS524U Internet Protocols and Applications (15 credits

**Plus one module from:**

MTH5103 Complex Variables (15 credits) (with EECS Director of UG Studies and Module Leader approval)

MTH5114 Linear Programming and Games (15 credits)

ECS620U Summer Internship (15 credits) (offered during the penultimate and final year)

**Final Year Modules**

**Semester 5**

ECS635U Project (30 credits) **Core**

ECS651U Computability, Complexity and Algorithms (15 credits)

**Plus two modules from:**

ECS610U Computer Graphics (15 credits) (pre requisite ECS401U)

ECS639U Web Programming (15 credits) (pre requisite ECS414U)

ECS640U Big Data Processing (15 credits)

ECS658U Further Object Oriented Programming (15 credits) (pre requisite ECS414U)

ECS671U Semi-Structured Data Engineering (15 credits) (pre –requisite ECS519U)

MTH5123 Differential Equations (15 credits) (**pre requisite MTH4101 and 5112)**

MTH5120 Statistical Modelling (15 credits) (replacing MTH5129 Probability and Statistics II (15 credits) 24-25)

MTH5130 Number Theory (15 credits) (with EECS Director of UG Studies and Module Leader approval)

MTH6141 Random Processes (15 credits) replacing MTH6115 Cryptography (15 credits) 24/25)

**Semester 6**

ECS635U Project (30 credits cont’d) **Core**

**Plus three modules from:**

ECS605U Image Processing (15 credits) (pre requisite ECS401U and ECS414U)

ECS637U Digital Media and Social Networks (15 credits)

ECS647U Bayesian Decision and Risk Analysis (15 credits)

ECS652U Compilers (15 credits) (pre requisite ECS414U and ECS421U)

ECS655U Security Engineering (15 credits)

ECS656U Distributed Systems (15 credits)

ECS659U Neural Networks and Deep Learning (15 credits)

ECS661U User Experience Design (15 credits) (pre requisite ECS522U)

MTH6105 Algorithmic Graph Theory (15 credits)

MTH6142 Complex Networks (15 credits)

**Elective modules are subject to timetabling constraints and module availability\*\*Other MTH modules may exceptionally be allowed with approval from School of Mathematical Sciences, but students will be informed there may be timetable clashes**

**5 January 2024**