Computer Science and Maths wIE BSc (Hons) options 2021-2022

You will be automatically enrolled on these six course units which total <u>100 credits</u>.

For the remaining <u>20 credits</u>:

You need to select one course unit from Option Pool 1 totalling <u>10 credits</u> and one course unit from Option Pool 2 totalling <u>10 credits</u>.

Level 1 - compulsory units

All of the units in this pool are mandatory.

Code	Title	Credits
COMP10120	First Year Team Project	20
COMP16321	Introduction to Programming 1	20
COMP16412	Introduction to Programming 2	10
MATH10111	Foundations of Pure Mathematics B	15
MATH10131	Calculus and Vectors B	15
MATH10212	Linear Algebra	15
MATH10232	Calculus and Applications	15

Level 1 - option pool 1

From this option pool choose 10 credits.

Code	Title	Credits
COMP11212	Fundamentals of Computation	10
COMP13212	Data Science	10
COMP15212	Operating Systems	10

Level 2 options

You will be automatically enrolled on MATH21120 Groups and Geometry which totals <u>20 credits</u>.

For the remaining <u>100 credits</u>:

You need to select a minimum of 2 courses totalling <u>40 credits</u> or a maximum of 3 courses totalling <u>60 credits</u> from Option Pool 1. COMP23311 and COMP23412 must be taken together and therefore count as one unit.

You may select a minimum of zero units and a maximum of one course unit totalling <u>10 credits</u> from Option Pool 2.

You may select a minimum of zero units and a maximum of one course unit totalling <u>10 credits</u> from Option Pool 3.

You need to select one course unit totalling <u>20 credits</u> from Option Pool 4. The choice of course unit is determined by the choice made in Year 1 from Option Pool 2.

You need to select one course unit totalling <u>10 credits</u> from Option Pool 5 (Semester 1).

You need to select one course unit totalling <u>10 credits</u> from Option Pool 6 (Semester 2).

If you take a <u>20 credit</u> whole year course unit you are not permitted to drop this unit when course unit selection reopens at the start of semester 2.

You must ensure your credits are balanced over the academic year (<u>60 credits</u> in each semester).

Level 2 - compulsory units

All of the units in this pool are mandatory.

Code	Title	Credits	Theme
MATH20111	Real Analysis	10	None
MATH20201	Algebraic Structures 1	10	None

Level 2 - option pool 1

From this option pool choose 40 credits.

Code	Title	Credits	Theme
COMP23311	Software Engineering 1	10	Agile Methods
COMP23412	Software Engineering 2	10	Agile Methods
COMP26120	Algorithms and Data Structures	20	Computer Languages
COMP26020	Programming Languages & Paradigms	20	None

Level 2 - option pool 2

From this option pool choose 10 credits.

Code	Title	Credits	Theme
COMP21111	Logic and Modelling	10	Rigorous Development
COMP23111	Database Systems	10	Web and Distributed Systems
COMP24011	Introduction to AI	10	None

Level 2 - option pool 3

From this option pool choose 10 credits.

Code	Title	Credits	Theme
MATH10141	Probability 1	10	None
MATH20411	Partial Differential Equations and Vector Calculus B	10	None

Level 2 - option pool 4

From this option pool choose 10 credits.

Code	Title	Credits	Theme
COMP24112	Machine Learning	10	None
COMP24412	Knowledge-based AI	10	Natural Language, Representation and Reasoning
COMP27112	Introduction to Visual Computing	10	Visual Computing
COMP28112	Distributed Systems	10	Web and Distributed Systems

Level 2 - option pool 5

From this option pool choose 30 credits.

Code	Title	Credits	Theme
MATH20122	Metric Spaces	10	None
MATH20132	Calculus and Several Variables	10	None
MATH20212	Algebraic Structures 2	10	None
MATH20222	Introduction to Geometry	10	None
MATH20502	Fluid Mechanics	10	None
MATH20512	Classical Mechanics	10	None
MATH20602	Numerical Analysis 1	10	None
MATH20902	Discrete Mathematics	10	None
MATH20912	Introduction to Financial Mathematics	10	None
MATH29142	Complex Analysis	10	None

Level 3 options

You will be automatically enrolled on the Third Year Project course unit which totals <u>30 credits</u>.

For the remaining <u>90 credits</u>:

You need to select a minimum of one course unit totalling <u>10 credits</u> or a maximum of three course units totalling <u>30 credits</u> from Option Pool 1.

You need to select a minimum of one course unit totalling <u>10 credits</u> or a maximum of three course units totalling <u>30 credits</u> from Option Pool 2.

You need to select a minimum of two course units totalling <u>20 credits</u> and a maximum of four course units totalling <u>40 credits</u> from CM Option Pool 3.

You need to select a minimum of two course units totalling <u>20 credits</u> and a maximum of four course units totalling <u>40 credits</u> from CM Option Pool 4.

Please note that some combinations of course units may not be possible due to timetable clashes.

If you wish to enrol on optional units (COMP or MATH) that are not listed below you must have permission from the Programme Tutor - Dr Andrea Schalk.

At least <u>40 credits</u> of MATH units in Year 3 must be at level 3.

You must ensure your credits are balanced over the academic year (<u>60 credits</u> in each semester).

If you take a <u>20 credit</u> whole year course unit you are not permitted to drop this unit when course unit selection reopens at the start of semester 2.

Level 3 - compulsory units

All of the units in this pool are mandatory.

Code	Title	Credits	Theme
COMP30030	3rd Year Project (Joint Hons 30 Credits)	30	None

Level 3 - option pool 1

From this option pool choose a maximum of 30 credits
and a minimum of 10 credits.

Code	Title	Credits	Theme
COMP31311	Giving meaning to programs	10	None
COMP33511	User Experience	10	Interactive Systems Design
COMP34111	AI & Games	10	None
COMP34711	Natural Language Processing	10	None
COMP36111	Algorithms and Complexity	10	Programming and Algorithms
COMP37111	Graphics and Virtual Environments	10	Visual Computing
COMP38311	Advanced Distributed Systems	10	None

Level 3 - option pool 2

From this option pool choose a maximum of 70 credits
and a minimum of 50 credits.

Code	Title	Credits	Theme
MATH30002	Mathematics Education	10	None
MATH31042	Fractal Geometry	10	None
MATH31052	Topology	10	None
MATH32001	Group Theory	10	None
MATH32012	Commutative Algebra	10	None
MATH32032	Coding Theory	10	None
MATH32051	Hyperbolic Geometry	10	None
MATH32062	Introduction to Algebraic Geometry	10	None
MATH32072	Introduction to Number Theory	10	None
MATH32091	Combinatorics and Graph Theory	10	None
MATH33011	Mathematical Logic	10	None
MATH34011	Asymptotic Expansions and Perturbation Methods	10	None
MATH35012	Wave Motion	10	None
MATH35032	Mathematical Biology	10	None
MATH35082	Symmetry in Nature	10	None
MATH36001	Matrix Analysis	10	None
MATH36022	Numerical Analysis II	10	None
MATH36031	Problem Solving by Computer	10	None
MATH36062	Convex Optimization	10	None
MATH39032	Mathematical Modelling in Finance	10	None

Level 3 - option pool 3

From this option pool choose a maximum of 30 credits
and a minimum of 10 credits.

Code	Title	Credits	Theme
COMP33312	Agile Software Pipelines	10	None
COMP34612	Computational Game Theory	10	None
COMP34812	Natural Language Understanding	10	None
COMP36212	Mathematical Systems and Computation	10	Programming and Algorithms
COMP37212	Computer Vision	10	Visual Computing
COMP39112	Quantum Computing	10	None
COMP32412	The Internet of Things: Architectures and Applications	10	Web and Distributed Systems