# Computer Science and Maths wIE BSc (Hons) options 2017-2018

<strong>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>.</strong>

## Level 1 - compulsory units

All of the units in this pool are mandatory.

| Code | Title | Credits |
|------|-------|---------|
| COMP10120 | First Year Team Project | 20 |
| COMP16121 | Object Oriented Programming with Java 1 | 20 |
| COMP16212 | Object Oriented Programming with Java 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 |
| COMP14112 | Fundamentals of Artificial Intelligence | 10 |
| COMP18112 | Fundamentals of Distributed Systems | 10 |

## Level 2 options

<strong>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. </strong>COMP23311 and COMP23412 must be taken together and therefore count as one unit.

<strong>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. </strong>The choice of course unit is determined by the choice made in Year 1 from Option Pool 2.

<strong>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).

</strong>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 |
|------|-------|---------|-------|
| COMP23311 | Software Engineering 1 | 10 | Agile Methods |
| COMP23412 | Software Engineering 2 | 10 | Software Engineering |
| COMP26120 | Algorithms and Imperative Programming | 20 | Computer Languages |
| MATH20111 | Real Analysis | 10 | None |
| MATH20142 | Complex Analysis | 10 | None |

| MATH20201 | Algebraic Structures 1 | 10 | None |
|-----------|------------------------|----|------|

### Level 2 - option pool 1

From this option pool choose 10 credits.

| Code | Title | Credits | Theme |
|------|-------|---------|-------|
| COMP21111 | Logic and Modelling | 10 | Rigorous Development |
| COMP23111 | Fundamentals of Databases | 10 | Web and Distributed Systems |
| COMP24111 | Machine Learning and Optimisation | 10 | Learning and Search in Artificial Intelligence |
| COMP25111 | Operating Systems | 10 | Computer Architecture |
| COMP28411 | Computer Networks | 10 | Mobile Computing and Networks |

### Level 2 - option pool 2

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 3

From this option pool choose 10 credits.

| Code | Title | Credits | Theme |
|------|-------|---------|-------|
| COMP24412 | Symbolic AI | 10 | Natural Language, Representation and Reasoning |
| COMP27112 | Computer Graphics and Image Processing | 10 | Visual Computing |
| COMP28112 | Distributed Computing | 10 | Web and Distributed Systems |

### Level 2 - option pool 4

From this option pool choose 20 credits.

| Code | Title | Credits | Theme |
|------|-------|---------|-------|
| MATH20122 | Metric Spaces | 10 | None |
| MATH20212 | Algebraic Structures 2 | 10 | None |
| MATH20302 | Introduction to Logic | 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 |

## Level 3 options

<strong>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.</strong>

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.</strong>

## 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 40 credits and a minimum of 30 credits.

| Code | Title | Credits | Theme |
|---|---|---|---|
| COMP31111 | Verified Development | 10 | Rigorous Development |
| COMP33511 | User Experience | 10 | Interactive Systems Design |
| COMP33711 | Agile Software Engineering | 10 | Agile Methods |
| COMP33812 | Software Evolution | 10 | Agile Methods |
| COMP34120 | AI and Games | 20 | Learning and Search in Artificial Intelligence |
| COMP34412 | Natural Language Systems | 10 | Natural Language, Representation and Reasoning |
| COMP35112 | Chip Multiprocessors | 10 | Computer Architecture |
| COMP36111 | Advanced Algorithms 1 | 10 | Programming and Algorithms |
| COMP36212 | Advanced Algorithms 2 | 10 | Programming and Algorithms |
| COMP36512 | Compilers | 10 | Computer Languages |
| COMP37111 | Advanced Computer Graphics | 10 | Visual Computing |
| COMP37212 | Computer Vision | 10 | Visual Computing |
| COMP38120 | Documents, Services and Data on the Web | 20 | Web and Distributed Systems |
| COMP38411 | Cryptography and Network Security | 10 | Mobile Computing and Networks |
| COMP39112 | Quantum Computing | 10 | None |
| COMP32412 | The Internet of Things: Architectures and Applications | 10 | Web and Distributed Systems |

## Level 3 - option pool 2

From this option pool choose a maximum of 70 credits and a minimum of 40 credits.

| Code | Title | Credits | Theme |
|---|---|---|---|
| MATH30002 | Mathematics Education | 10 | None |
| MATH31001 | Linear Analysis | 10 | None |
| MATH31052 | Topology | 10 | None |
| MATH32001 | Group Theory | 10 | None |
| MATH32011 | Commutative Algebra | 10 | None |
| MATH32032 | Coding Theory | 10 | None |
| MATH32051 | Hyperbolic Geometry | 10 | None |
| MATH32062 | Introduction to Algebraic Geometry | 10 | None |
| MATH32072 | Number Theory | 10 | None |
| MATH33011 | Mathematical Logic | 10 | None |
| MATH34001 | Applied Complex Analysis | 10 | None |
| MATH34011 | Asymptotic Expansions and Perturbation Methods | 10 | None |
| MATH35032 | Mathematical Biology | 10 | None |
| MATH36001 | Matrix Analysis | 10 | None |
| MATH36032 | Problem Solving by Computer | 10 | None |
| MATH36061 | Convex Optimisations | 10 | None |
| MATH39001 | Combinatorics and Graph Theory | 10 | None |
| MATH39032 | Mathematical Modelling in Finance | 10 | None |