

## Software Engineering BSc (Hons) options 2018-2019

You will be automatically enrolled on these nine course units which total 120 credits.

### Level 1 - compulsory units

All of the units in this pool are mandatory.

| Code      | Title  | Credits |
|-----------|--|---------|
| COMP10120 | First Year Team Project                      | 20      |
| COMP11120 | Mathematical Techniques for Computer Science | 20      |
| COMP11212 | Fundamentals of Computation                  | 10      |
| COMP12111 | Fundamentals of Computer Engineering         | 10      |
| COMP14112 | Fundamentals of Artificial Intelligence      | 10      |
| COMP15111 | Fundamentals of Computer Architecture        | 10      |
| COMP16121 | Object Oriented Programming with Java 1      | 20      |
| COMP16212 | Object Oriented Programming with Java 2      | 10      |
| COMP18112 | Fundamentals of Distributed Systems          | 10      |

### Level 2 options

You will be automatically enrolled on these six course units which total 80 credits.

You need to select a minimum of one course unit totalling 10 credits or a maximum of two course units totalling 20 credits from Option Pool 1. You need to select a minimum of one course unit totalling 10 credits or a maximum of two course units totalling 20 credits from Option Pool 2.

You may choose a maximum of 10 credits of external units from External Option Pool 1 and a maximum of 10 credits of external units from External Option Pool 2.

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

You can also choose up to 20 credits of optional course units that are external to the Department. You can choose any Level 1 or 2 options for which you meet any pre-requisites and fits with your timetable, these may be:

- Business and Management course units: <https://www.ambs.ug handbook.manchester.ac.uk/non-ambs-students/>
- University College course units
- Language course units: <https://www.alc.manchester.ac.uk/study/university-language-centre-leap-courses/course-information/leap-courses/courses-for-all/>
- HSTM20282 Information Visions <https://www.manchester.ac.uk/study/undergraduate/courses/2021/00485/bsc-biology-with-science-and-society/course-details/HSTM20282#course-unit-details>

Please note: to enrol on some external course units (such as Language) will require permission from the associated School/Department.

To select any external course units outside of the list given above will require permission from the 2nd Year Tutor.

You must ensure your credits are balanced over the academic year (60 credits in each semester). This programme requires 2 themes to be completed from the following list.

- \* Agile Methods (COMP23311, COMP23412 & COMP33711)
- \* Rigorous Development (COMP21111)
- \* Software Engineering (COMP23311, COMP23412 & COMP33511)

### Level 2 - compulsory units

All of the units in this pool are mandatory.

| Code      | Title                     | Credits | Theme                       |
|-----------|---------------------------|---------|-----------------------------|
| COMP23111 | Fundamentals of Databases | 10      | Web and Distributed Systems |
| COMP23311 | Software Engineering 1    | 10      | Agile Methods               |
| COMP23412 | Software Engineering 2    | 10      | Agile Methods               |

|           |                                       |    |                             |
|-----------|---------------------------------------|----|-----------------------------|
| COMP25111 | Operating Systems                     | 10 | Computer Architecture       |
| COMP26120 | Algorithms and Imperative Programming | 20 | Computer Languages          |
| COMP28112 | Distributed Computing                 | 10 | Web and Distributed Systems |

### Level 2 - option pool 1

From this option pool choose a maximum of 20 credits  
and a minimum of 10 credits.

| Code      | Title                             | Credits | Theme  |
|-----------|-----------------------------------|---------|--|
| COMP21111 | Logic and Modelling               | 10      | Rigorous Development                           |
| COMP22111 | Processor Microarchitecture       | 10      | System-on-Chip                                 |
| COMP24111 | Machine Learning and Optimisation | 10      | Learning and Search in Artificial Intelligence |

### Level 2 - option pool 2

From this option pool choose a maximum of 30 credits  
and a minimum of 20 credits.

| Code      | Title                                  | Credits | Theme  |
|-----------|--|---------|--|
| COMP22712 | Microcontrollers                       | 10      | None   |
| COMP24412 | Symbolic AI                            | 10      | Natural Language, Representation and Reasoning |
| COMP25212 | System Architecture                    | 10      | Computer Architecture                          |
| COMP27112 | Computer Graphics and Image Processing | 10      | Visual Computing                               |
| COMP28512 | Mobile Systems                         | 10      | Mobile Computing and Networks                  |

### Level 2 - option pool 3

From this option pool choose a maximum of 10 credits  
and a minimum of 0 credits.

| Code       | Title   | Credits | Theme |
|------------|---|---------|-------|
| BMAN10011  | Fundamentals of Management                                    | 10      | None  |
| BMAN10621B | Fundamentals of Financial Reporting                           | 10      | None  |
| BMAN20821  | New Product Development and Innovation                        | 10      | None  |
| BMAN21061  | Introduction to Management Information Systems                | 10      | None  |
| UCIL10201  | Language, Mind and Brain                                      | 20      | None  |
| UCIL10221  | Science and the Modern World                                  | 10      | None  |
| UCIL20001  | Leadership of Learning  | 10      | None  |
| UCIL20021  | Leadership in Action  | 10      | None  |
| UCIL20031  | Leadership in Action Online Unit                              | 10      | None  |
| UCIL20111  | Core Themes in Animation and Visual Culture of Post War Japan | 10      | None  |
| UCIL20211  | Are we alone?   | 10      | None  |
| UCIL20331  | From Cholera to Aids: A Global History of Epidemics           | 10      | None  |
| UCIL21301  | Communicating with Confidence                                 | 10      | None  |
| UCIL21331  | Becoming an inspirational individual                          | 10      | None  |
| UCIL22001  | Essential Enterprise  | 10      | None  |
| UCIL22501  | Global Citizenship and Sustainability                         | 10      | None  |
| UCIL24141  | Science, Technology and Democracy                             | 10      | None  |
| ULAR10032  | Introduction to Spoken Arabic                                 | 10      | None  |
| ULBS20011  | Intro to British Sign Language S1                             | 10      | None  |
| ULCH10022  | Introduction to Spoken Chinese                                | 10      | None  |
| ULCH20021  | Post-intermediate Chinese - first semester                    | 10      | None  |
| ULFR10022  | Introductory French   | 10      | None  |
| ULFR10032  | Introductory French   | 10      | None  |
| ULGE10012  | Beginners German  | 10      | None  |
| ULGE10021  | Introductory German   | 10      | None  |
| ULGE10022  | Introductory German   | 10      | None  |
| ULIT10011  | Beginners' Italian  | 10      | None  |
| ULIT10022  | Introductory Italian  | 10      | None  |
| ULJA20112  | Pre-intermediate Japanese                                     | 10      | None  |
| ULSP10021  | Introductory Spanish  | 10      | None  |
| ULSP10022  | Introductory Spanish  | 10      | None  |

### Level 2 - option pool 4

From this option pool choose a maximum of 10 credits  
and a minimum of 0 credits.

| Code      | Title                                | Credits | Theme |
|-----------|--------------------------------------|---------|-------|
| BMAN10252 | Fundamentals of Technological Change | 10      | None  |
| BMAN10552 | Fundamentals of Finance              | 10      | None  |

|           |   |    |      |
|-----------|---|----|------|
| BMAN10612 | Business Economics  | 10 | None |
| BMAN10632 | Fundamentals of Accounting                                | 10 | None |
| BMAN20242 | Introduction to Corporate Finance & Financial Instruments | 10 | None |
| BMAN20792 | Technology Strategy & Innovation 1                        | 10 | None |
| BMAN20832 | Marketing   | 10 | None |
| BMAN21012 | Global Contexts of Business and Management                | 10 | None |
| UCIL20022 | Leadership in Action                                      | 10 | None |
| UCIL20032 | Leadership in Action Online Unit                          | 10 | None |
| UCIL20092 | The Crisis of Nature: Issues in Environmental History     | 10 | None |
| UCIL20102 | Multilingual Manchester                                   | 10 | None |
| UCIL20112 | Understanding Mental Health                               | 10 | None |
| UCIL20112 | Understanding Mental Health                               | 10 | None |
| UCIL20122 | AI: Robot Overlord, Replacement or Colleague?             | 10 | None |
| UCIL20122 | AI: Robot Overlord, Replacement or Colleague?             | 10 | None |
| UCIL20282 | The Information Age                                       | 10 | None |
| UCIL20882 | An Introduction to Current Topics in Biology              | 10 | None |
| UCIL21002 | Leadership of Learning                                    | 10 | None |
| UCIL21202 | Bioethics: Contemporary Issues in Science and Biomedicine | 10 | None |
| UCIL21302 | Communicating with Confidence                             | 10 | None |
| UCIL21802 | Body, Health and Well-Being                               | 10 | None |
| UCIL22002 | Essential Enterprise                                      | 10 | None |
| UCIL23302 | Science and Civilisation in East Asia                     | 10 | None |
| UCIL24002 | The Art of Enterprise                                     | 10 | None |
| UCIL25002 | The Digital Society                                       | 10 | None |
| UCIL29002 | Physics & The Grand Challenges of Today                   | 10 | None |
| ULBS20012 | British Sign Language                                     | 10 | None |
| ULBS20022 | Introduction to British Sign Language - Part 2            | 10 | None |
| ULJA10022 | Introduction to Spoken Japanese                           | 10 | None |

## Level 2 - option pool 5

From this option pool choose a maximum of 20 credits  
and a minimum of 0 credits.

| Code      | Title                                  | Credits |      | Theme |
|-----------|--|---------|------|-------|
| ULAR10010 | Beginners' Arabic                      | 20      | None |       |
| ULAR10020 | Elementary Arabic                      | 20      | None |       |
| ULAR11010 | Beginners' Arabic                      | 20      | None |       |
| ULAR20110 | Intermediate Arabic                    | 20      | None |       |
| ULAR20210 | Pre-intermediate Arabic                | 20      | None |       |
| ULAR21110 | Intermediate Arabic NC                 | 20      | None |       |
| ULCH10200 | Beginners' Mandarin Chinese            | 20      | None |       |
| ULCH20020 | Post-intermediate Mandarin Chinese     | 20      | None |       |
| ULCH20110 | Pre-intermediate Mandarin Chinese      | 20      | None |       |
| ULDU10010 | Beginners' Dutch                       | 20      | None |       |
| ULDU20010 | Intermediate Dutch                     | 20      | None |       |
| ULFR10010 | Beginners' French                      | 20      | None |       |
| ULFR11010 | Intermediate Business French           | 20      | None |       |
| ULFR20010 | Intermediate French                    | 20      | None |       |
| ULFR20020 | Post-intermediate French               | 20      | None |       |
| ULFR20030 | Further French                         | 20      | None |       |
| ULFR20110 | Pre-Intermediate French                | 20      | None |       |
| ULGE10010 | Beginners' German                      | 20      | None |       |
| ULGE20010 | Intermediate German                    | 20      | None |       |
| ULGE20020 | Post-Intermediate German               | 20      | None |       |
| ULGE20030 | Further German                         | 20      | None |       |
| ULGE20110 | Pre-intermediate German                | 20      | None |       |
| ULGE30022 | Introductory German (A1.1+) - Enhanced | 10      | None |       |
| ULHB10030 | Beginners' Hebrew                      | 20      | None |       |
| ULHB20030 | Intermediate Hebrew                    | 20      | None |       |
| ULIT10010 | Beginner's Italian                     | 20      | None |       |
| ULIT20010 | Intermediate Italian                   | 20      | None |       |
| ULIT20020 | Post-Intermediate Italian              | 20      | None |       |
| ULIT20110 | Pre-Intermediate Italian               | 20      | None |       |
| ULIT30010 | Beginners' Italian                     | 20      | None |       |
| ULJA10010 | Beginners' Japanese                    | 20      | None |       |
| ULJA11010 | Beginners' Japanese                    | 0       | None |       |
| ULJA20010 | Intermediate Japanese                  | 20      | None |       |
| ULJA20020 | Post-intermediate Japanese             | 20      | None |       |
| ULJA20110 | Pre-Intermediate Japanese              | 20      | None |       |
| ULJA21010 | Intermediate Japanese                  | 0       | None |       |
| ULKR10010 | Beginners' Korean                      | 20      | None |       |

|           |                                |    |      |
|-----------|--------------------------------|----|------|
| ULPT10010 | Beginners' Portuguese          | 20 | None |
| ULRU10010 | Beginners' Russian             | 20 | None |
| ULRU20010 | Intermediate Russian           | 20 | None |
| ULSP10010 | Beginners' Spanish             | 20 | None |
| ULSP10050 | Beginners Spanish (Fast track) | 20 | None |
| ULSP20010 | Intermediate Spanish           | 20 | None |
| ULSP20020 | Intermediate Spanish           | 20 | None |
| ULSP20030 | Further Spanish                | 20 | None |
| ULSP20110 | Pre-Intermediate Spanish       | 20 | None |

### Level 3 options

You will be automatically enrolled on three course units, including the Third Year Project course unit, totalling 60 credits.

You need to select a minimum of two courses totalling 20 credits or a maximum of three courses totalling 30 credits from Option Pool 1. You need to select a minimum of two courses totalling 20 credits or a maximum of three courses totalling 30 credits from Option Pool 2.

You may choose a maximum of 10 credits of external units from External Option Pool 1 and a maximum of 10 credits of external units from External Option Pool 2. You may choose a maximum of 20 credits of BMAN30010. Please note that as this is a year-long course unit if you take this in semester one you must continue in semester 2.

You can also choose up to 20 credits of optional course units that are external to the Department. You can choose any Level 2 or 3 options for which you meet any pre-requisites and fits with your timetable, these may be:

- Business and Management course units: <https://www.ambs.ug handbook.manchester.ac.uk/non-ambs-students/>
- University College course units
- Language course units: <https://www.alc.manchester.ac.uk/study/university-language-centre-leap-courses/course-information/leap-courses/courses-for-all/>
- HSTM20282 Information Visions <https://www.manchester.ac.uk/study/undergraduate/courses/2021/00485/bsc-biology-with-science-and-society/course-details/HSTM20282#course-unit-details>

Please note: to enrol on some external course units (such as Language) will require permission from the associated School/Department.

To select any external course units outside of the list given above will require permission from the 3rd Year Tutor.

You must ensure your credits are balanced over the academic year (60 credits in each semester). This programme requires 2 themes to be completed from the following list.

- \* Agile Methods (COMP23311, COMP23412 & COMP33711)
- \* Rigorous Development (COMP21111)
- \* Software Engineering (COMP23311, COMP23412 & COMP33511)

### Level 3 - compulsory units

All of the units in this pool are mandatory.

| Code      | Title  | Credits | Theme |
|-----------|--|---------|-------|
| COMP30040 | 3rd Year Project (Single Honours 40 Credits) | 40      | None  |

### Level 3 - option pool 1

From this option pool choose a maximum of 40 credits and a minimum of 20 credits.

| Code      | Title                               | Credits | Theme                         |
|-----------|-------------------------------------|---------|-------------------------------|
| COMP32211 | Implementing System-on-Chip Designs | 10      | System-on-Chip                |
| COMP33511 | User Experience                     | 10      | Interactive Systems Design    |
| COMP33711 | Agile Software Engineering          | 10      | Agile Methods                 |
| COMP36111 | Advanced Algorithms 1               | 10      | Programming and Algorithms    |
| COMP37111 | Advanced Computer Graphics          | 10      | Visual Computing              |
| COMP38411 | Cryptography and Network Security   | 10      | Mobile Computing and Networks |

### Level 3 - option pool 2

From this option pool choose a maximum of 40 credits  
and a minimum of 20 credits.

| Code      | Title  | Credits | Theme  |
|-----------|--|---------|--|
| COMP34412 | Natural Language Systems                               | 10      | Natural Language, Representation and Reasoning |
| COMP35112 | Chip Multiprocessors                                   | 10      | Computer Architecture                          |
| COMP36212 | Advanced Algorithms 2                                  | 10      | Programming and Algorithms                     |
| COMP36512 | Compilers  | 10      | Computer Languages                             |
| COMP37212 | Computer Vision  | 10      | Visual Computing                               |
| COMP32412 | The Internet of Things: Architectures and Applications | 10      | Web and Distributed Systems                    |

### Level 3 - option pool 3

From this option pool choose a maximum of 40 credits  
and a minimum of 0 credits.

| Code      | Title                                   | Credits | Theme  |
|-----------|---|---------|--|
| COMP34120 | AI and Games                            | 20      | Learning and Search in Artificial Intelligence |
| COMP38120 | Documents, Services and Data on the Web | 20      | Web and Distributed Systems                    |

### Level 3 - option pool 4

From this option pool choose a maximum of 20 credits  
and a minimum of 0 credits.

| Code      | Title   | Credits | Theme |
|-----------|---|---------|-------|
| BMAN20242 | Introduction to Corporate Finance & Financial Instruments     | 10      | None  |
| BMAN20792 | Technology Strategy & Innovation I                            | 10      | None  |
| BMAN20821 | New Product Development and Innovation                        | 10      | None  |
| BMAN20832 | Marketing   | 10      | None  |
| BMAN21012 | Global Contexts of Business and Management                    | 10      | None  |
| BMAN21061 | Introduction to Management Information Systems                | 10      | None  |
| BMAN30010 | Management of Knowledge and Innovation                        | 20      | None  |
| BMAN30021 | Marketing   | 10      | None  |
| BMAN30022 | Strategy  | 10      | None  |
| BMAN30042 | Human Resource Management                                     | 10      | None  |
| BMAN30202 | Cases in Digital Transformation                               | 10      | None  |
| BMAN31212 | Investment Economics and Innovation                           | 10      | None  |
| MCEL30001 | Tools and Techniques for Enterprise                           | 10      | None  |
| MCEL30002 | Tools and Techniques for Enterprise                           | 10      | None  |
| MCEL30031 | Enterprise Management for Computer Scientists                 | 10      | None  |
| MCEL30032 | Managing Finance in Enterprises for Computer Scientists       | 10      | None  |
| UCIL20001 | Leadership of Learning  | 10      | None  |
| UCIL20021 | Leadership in Action  | 10      | None  |
| UCIL20022 | Leadership in Action  | 10      | None  |
| UCIL20031 | Leadership in Action Online Unit                              | 10      | None  |
| UCIL20032 | Leadership in Action Online Unit                              | 10      | None  |
| UCIL20092 | The Crisis of Nature: Issues in Environmental History         | 10      | None  |
| UCIL20102 | Multilingual Manchester                                       | 10      | None  |
| UCIL20111 | Core Themes in Animation and Visual Culture of Post War Japan | 10      | None  |
| UCIL20112 | Understanding Mental Health                                   | 10      | None  |
| UCIL20122 | AI: Robot Overlord, Replacement or Colleague?                 | 10      | None  |
| UCIL20122 | AI: Robot Overlord, Replacement or Colleague?                 | 10      | None  |
| UCIL20211 | Are we alone?   | 10      | None  |
| UCIL20282 | The Information Age   | 10      | None  |
| UCIL20331 | From Cholera to Aids: A Global History of Epidemics           | 10      | None  |
| UCIL20882 | An Introduction to Current Topics in Biology                  | 10      | None  |
| UCIL21002 | Leadership of Learning  | 10      | None  |
| UCIL21202 | Bioethics: Contemporary Issues in Science and Biomedicine     | 10      | None  |
| UCIL21301 | Communicating with Confidence                                 | 10      | None  |
| UCIL21302 | Communicating with Confidence                                 | 10      | None  |
| UCIL21331 | Becoming an inspirational individual                          | 10      | None  |
| UCIL21802 | Body, Health and Well-Being                                   | 10      | None  |
| UCIL22001 | Essential Enterprise  | 10      | None  |
| UCIL22002 | Essential Enterprise  | 10      | None  |
| UCIL22501 | Global Citizenship and Sustainability                         | 10      | None  |
| UCIL23302 | Science and Civilisation in East Asia                         | 10      | None  |
| UCIL24141 | Science, Technology and Democracy                             | 10      | None  |
| UCIL29002 | Physics & The Grand Challenges of Today                       | 10      | None  |
| UCIL30232 | Health, Development and People                                | 10      | None  |
| UCIL30832 | Madness and Society in the Modern Age                         | 10      | None  |
| UCIL30832 | Madness and Society in the Modern Age                         | 10      | None  |

|           |  |    |      |
|-----------|--|----|------|
| UCIL31212 | The Nuclear Age                                  | 10 | None |
| UCIL32011 | From Sherlock Holmes to CSI                      | 10 | None |
| UCIL33201 | Climate Change and Society                       | 10 | None |
| ULAR20110 | Intermediate Arabic                              | 20 | None |
| ULAR20210 | Pre-intermediate Arabic                          | 20 | None |
| ULAR21110 | Intermediate Arabic NC                           | 20 | None |
| ULBS20011 | Intro to British Sign Language S1                | 10 | None |
| ULBS20012 | British Sign Language                            | 10 | None |
| ULBS20022 | Introduction to British Sign Language - Part 2   | 10 | None |
| ULCH20020 | Post-intermediate Mandarin Chinese               | 20 | None |
| ULCH20021 | Post-intermediate Chinese - first semester       | 10 | None |
| ULCH20110 | Pre-intermediate Mandarin Chinese                | 20 | None |
| ULCH30030 | Advanced Mandarin Chinese                        | 20 | None |
| ULDU20010 | Intermediate Dutch                               | 20 | None |
| ULFR20010 | Intermediate French                              | 20 | None |
| ULFR20020 | Post-intermediate French                         | 20 | None |
| ULFR20030 | Further French                                   | 20 | None |
| ULFR20110 | Pre-Intermediate French                          | 20 | None |
| ULFR30010 | Beginners' French - Enhanced                     | 20 | None |
| ULFR30022 | Introductory French - Enhanced                   | 10 | None |
| ULGE20010 | Intermediate German                              | 20 | None |
| ULGE20020 | Post-Intermediate German                         | 20 | None |
| ULGE20030 | Further German                                   | 20 | None |
| ULGE20110 | Pre-intermediate German                          | 20 | None |
| ULGE30010 | Beginners' German Enhanced                       | 20 | None |
| ULGE30021 | Introductory German                              | 10 | None |
| ULGE30022 | Introductory German (A1.1+) - Enhanced           | 10 | None |
| ULGE30030 | Advanced German                                  | 20 | None |
| ULHB20030 | Intermediate Hebrew                              | 20 | None |
| ULIT20010 | Intermediate Italian                             | 20 | None |
| ULIT20020 | Post-Intermediate Italian                        | 20 | None |
| ULIT20110 | Pre-Intermediate Italian                         | 20 | None |
| ULIT30010 | Beginners' Italian                               | 20 | None |
| ULIT30022 | ULIT30022 - Introductory Italian (A1) - Enhanced | 10 | None |
| ULJA20010 | Intermediate Japanese                            | 20 | None |
| ULJA20020 | Post-intermediate Japanese                       | 20 | None |
| ULJA20110 | Pre-Intermediate Japanese                        | 20 | None |
| ULJA20112 | Pre-intermediate Japanese                        | 10 | None |
| ULJA21010 | Intermediate Japanese                            | 0  | None |
| ULRU20010 | Intermediate Russian                             | 20 | None |
| ULSP20010 | Intermediate Spanish                             | 20 | None |
| ULSP20020 | Intermediate Spanish                             | 20 | None |
| ULSP20030 | Further Spanish                                  | 20 | None |
| ULSP20110 | Pre-Intermediate Spanish                         | 20 | None |
| ULSP30010 | Beginners Spanish (Enhanced)                     | 20 | None |
| ULSP30022 | Introductory Spanish (Enhanced)                  | 10 | None |