

## Computer Systems Engineering wIE BEng (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 seven course units which total 90 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 may select a minimum of zero course units or a maximum of one course unit totalling 10 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 can 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.

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 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.

- \* Computer Architecture (COMP25111, COMP25212 & COMP35112)
- \* System-on-Chip (COMP22111 & COMP32211)

### Level 2 - compulsory units

All of the units in this pool are mandatory.

Code	Title	Credits	Theme
COMP22111	Processor Microarchitecture	10	System-on-Chip
COMP22712	Microcontrollers	10	None
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

COMP25212	System Architecture	10	Computer Architecture
COMP26120	Algorithms and Imperative Programming	20	Computer Languages
COMP28512	Mobile Systems	10	Mobile Computing and Networks

### Level 2 - option pool 1

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

Code	Title	Credits	Theme
COMP21111	Logic and Modelling	10	Rigorous Development
COMP24111	Machine Learning and Optimisation	10	Learning and Search in Artificial Intelligence
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
ULBS20011	Intro to British Sign Language S1	10	None
ULCH20021	Post-intermediate Chinese - first semester	10	None
ULGE10021	Introductory German	10	None
ULIT10011	Beginners' Italian	10	None
ULSP10021	Introductory Spanish	10	None

### Level 2 - option pool 2

From this option pool choose a maximum of 10 credits  
and a minimum of 0 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
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
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
ULAR10032	Introduction to Spoken Arabic	10	None
ULBS20012	British Sign Language	10	None

ULBS20022	Introduction to British Sign Language - Part 2	10	None
ULCH10022	Introduction to Spoken Chinese	10	None
ULFR10022	Introductory French	10	None
ULFR10032	Introductory French	10	None
ULGE10012	Beginners German	10	None
ULGE10022	Introductory German	10	None
ULIT10022	Introductory Italian	10	None
ULJA10022	Introduction to Spoken Japanese	10	None
ULJA20112	Pre-intermediate Japanese	10	None
ULSP10022	Introductory Spanish	10	None

### Level 2 - option pool 3

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 one course unit totalling 10 credits or a maximum of three courses totalling 30 credits from Option Pool 1. You need to select a minimum of one course totalling 10 credits or a**

maximum of three courses totalling 30 credits from Option Pool 2. You may choose a maximum of <u>10 credits</u> of external units from External Option Pool 1 and a maximum of <u>10 credits</u> of external units from External Option Pool 2. You may choose a maximum of <u>20 credits</u> 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.<strong>

<strong>You can also choose up to <u>20 credits</u> 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 <a href="/ugt/index.php#tutors">3rd Year Tutor</a>.

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

- \* Computer Architecture (COMP25111, COMP25212 & COMP35112)
- \* System-on-Chip (COMP22111 & COMP32211)

### 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	
COMP32211	Implementing System-on-Chip Designs	10	System-on-Chip	
COMP35112	Chip Multiprocessors	10	Computer Architecture	

### 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
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 30 credits and a minimum of 10 credits.

Code	Title	Credits		Theme
COMP34412	Natural Language Systems	10	Natural Language, Representation and Reasoning	
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 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 1	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
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

### Level 3 - option pool 4

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