

## Computer Science (Human Computer Interaction) BSc (Hons) 2014-2015 Summary

UCAS code	Award	Title	Duration	Mode
I140	BSc	Computer Science (Human Computer Interaction) BSc (Hons)	3 years	FT

Schools	Computer Science
Faculty	Engineering and Physical Sciences
Awarding Institution	University of Manchester
Programme Accreditation	
Relevant QAA benchmark(s)	Computing

## **Aims and intended learning outcomes**

Our programmes aim to:

- 1) enable graduates to exhibit a high level of practical and theoretical skills over a broad range of Computer Science together with a knowledge of currently available techniques and technologies in Human Computer Interaction.
- 2) explore the principles that support developments in a rapidly changing subject.
- 3) provide opportunities for students to understand the wide range of research challenges facing Computer Science and Human Computer Interaction, as well as the breadth and depth of research undertaken in this top-rated school, so they are prepared to embark on research here or elsewhere.
- 4) develop competent professionals able to play a leading part in many different commercial, industrial and academic activities and adapt rapidly to changing technology.
- 5) meet industry demand for high calibre graduates who will take a lead in continuing technological change.
- 6) prepare students for the social, organisational and professional context in which they will be working.
- 7) In addition, the with Industrial Experience programmes aim to: give extensive practical experience of an industrial or business environment where students are able to apply and develop their skills, both technical and personal.
- 8) In addition, the MEng programmes aim to: prepare high fliers for professional practice in Computer Science by enhanced depth and breadth of study together with increased emphasis on industrial relevance through industrially related group projects.

### **Intended learning outcomes**

#### **Knowledge & understanding**

- A1 Know and understand the essential mathematics relevant to computer science.
- A2 Understand and apply a wide range of principles and tools available to the software engineer, such as design methodologies, choice of algorithm, language, software libraries and user interface techniques
- A3 Demonstrate a grasp of the principles of computer systems, including architecture, networks and communication
- A4 Recognise and appreciate the professional and ethical responsibilities of the practising computer professional, including understanding the need for quality
- A5 Know and understand the principles and techniques of a number of application areas informed by the research directions of the subject, such as artificial intelligence, databases and computer graphics
- A6 Apply their knowledge of computing in a commercial or industrial context
- A7 Show a critical understanding of the broad context within which Computer Science resides, including issues such as quality, reliability, enterprise, employment law, accounting and health and safety
- A8 Have a comprehensive knowledge and critical awareness of selected specialist fields at the forefront of computer science, studied at masters level

#### **Intellectual (thinking) skills**

- B1 Solve a wide range of problems related to the analysis, design and construction of computer systems.
- B2 Design and implement a software or hardware system of significant size
- B3 Identify a range of solutions and critically evaluate and justify proposed design solutions
- B4 Solve computer science problems with pressing commercial or industrial constraints
- B5 Generate an innovative design to solve a problem containing a range of commercial and industrial constraints

**Practical skills**

- C1 Plan and undertake a major individual project
- C2 Prepare and deliver coherent and structured verbal and written technical reports
- C3 Give technical presentations suitable for the time, place and audience
- C4 Use the scientific literature effectively and make discriminating use of Web resources
- C5 Design, write and debug computer programs in appropriate languages
- C6 Use appropriate computer-based design support tools
- C7 Apply computer science skills in a commercial or industrial environment
- C8 Demonstrate initiative taking, innovation and self-management in an industrially related group project
- C9 Integrate previously acquired skills and apply them to new, demanding situations

**Transferable skills**

- D1 Display an integrated approach to the deployment of communication skills
- D2 Use IT skills and display mature computer literacy
- D3 Work effectively with and for others
- D4 Strike the balance between self-reliance and seeking help when necessary in new situations
- D5 Display personal responsibility by working to multiple deadlines in complex activities
- D6 Employ discrete and continuous mathematical skills as appropriate
- D7 Demonstrate significantly enhanced group working abilities
- D8 Further develop career plans and personal objectives
- D9 Communicate effectively with non-specialist as well as computer scientist professionals at a range of levels
- D10 Undertake a range of technical roles within a team and be able to display leadership

## Teaching, learning and assessment methods

Learning and Teaching on all our programmes aims to combine an understanding of fundamental CS and HCI principles, development of strong practical skills and the group-working, learning and communication skills that are essential for any computing professional.

Course units which involve practical elements all have associated laboratory exercises, usually in timetabled sessions with staff and demonstrator support. Most labs operate a system of face-to-face marking in the lab so that students receive immediate feedback on their work. Units without labs all have regular coursework exercises to support skills development and feedback.

Most units are lecture based, with lab or coursework exercises used to reinforce and enhance knowledge and skills first encountered in lectures. The first year team project deviates significantly from this model and takes an Enquiry Based Learning approach. This unit aims to encourage students to be more actively engaged with, and responsible for, their own learning, to develop skills in problem solving, communication, independent learning, and group work, and to signal the importance we attach to independent learning. This approach is followed up in the second year with the workshop based approach used in the compulsory Software Engineering unit, which also contains a major group working component.

The choice of units offered to students on our programmes is very broad, but they also require depth in study into Human Computer Interaction. The first and second years are reasonably core and include units from Life Sciences, Psychology, and Social Science (specifically Social Statistics). The final years allows more choice. It is intended that by the end of the BSc the students will have been given a deep education in HCI and that if the student chooses to take the MEng year, they will be introduced to a number of specialist domains, or be able to pursue aspects already introduced to a higher level.

All students undertake an individual 3rd year project, supervised by a member of academic task, which usually involves the development of significant software or hardware product. Assessment of this unit involves presentations of plans and results and a major written report

Assessment in almost all units is a combination of lab/coursework and examination.

## Learning, Teaching and Assessment of intended learning outcomes

### Knowledge and Understanding

Learning and Teaching Processes	Assessment
Lectures (A1, A2, A3, A4, A5, A6, A7)	Unseen written examinations (A1, A2, A3, A4)
Laboratory sessions (A2, A3)	Marked tutorial exercises (A1, A2, A3, A4)
Personal tutorials (A1, A2, A3, A4, A7)	Laboratory reports (A2, A3)
Problem solving classes (A1, A2, A3, A4)	Project reports (individual and group) (A3, A4, A5, A6, A7)
Problem-based learning (A2, A3, A4, A5, A6, A7)	Oral presentations (individual and group) (A3, A4, A5, A6, A7)
Projects (A3, A4, A5, A6, A7)	
Industrial seminars (A4, A5, A6, A7)	

### Intellectual Skills

Learning and Teaching Processes	Assessment
Lectures (B1, B2, B4, B5)	Unseen written examinations (B1, B2, B4)
Laboratory sessions (B1, B2)	Marked tutorial exercises (B1, B2)
Personal tutorials (B1, B2, B4)	Laboratory reports (B1, B2)
Problem solving classes (B1, B2, B4)	Project reports (individual and group) (B1, B2, B3, B4, B5)
Problem-based learning (B1, B2, B4)	Oral presentations (individual and group) (B1, B2, B3, B4, B5)
Projects (B1, B2, B3, B4, B5)	

### Practical Skills

Learning and Teaching Processes	Assessment
Lectures (C4, C6)	Laboratory reports (C1, C2, C3, C4, C5, C6, C7)
Laboratory sessions (C1, C2, C3, C4, C5, C6, C7)	Project reports (individual and group) (C3, C4, C5, C6)
Projects (C3, C4, C5, C6, C9)	Oral presentations (individual and group) (C6, C8, C9)
Industrial placement (C8, C9)	Industrial placement reports (C8, C9)

## Transferable skills

Learning and Teaching Processes		Assessment
Lectures (D3, D4, D5, D7)		Laboratory reports (D1, D3, D5, D6)
Laboratory sessions (D1, D3, D5, D6)		Essays (D2, D3)
Personal tutorials (D1, D2, D3, D4, D7)		Project reports (individual and group) (D1, D2, D3, D4, D5, D6, D7)
Problem solving classes (D4)		Oral presentations (individual and group) (D1, D3, D6, D7, D8)
Problem-based learning (D1, D2, D3, D4, D5, D6)		Industrial placement reports (D8)
Projects (D1, D2, D3, D4, D5, D6, D7)		
Industrial placement (D8)		

## Programme structure

120 credits of core units

### Level 1 - compulsory units

All of the units in this pool are mandatory.

Code	Title	Credits
COMP10120	First Year Team Project	20
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
COMP19120	Brain, Cognition, Sensation, Perception, Language and Communication	20
BIOL10832	Excitable Cells	10
PSYC10100	Research Methods	20

### Level 2 options

You have 90 credits of compulsory course units listed in the table "compulsory units" below.

Out of the remaining 30 credits of free choice:

You must choose at least 30 credits of other optional course units; at least 10 credits from option pool 1 below and up to 10 credits from 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 should try and balance your credits over the academic year as best as possible.

### 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
COMP23420	Software Engineering	20	Agile Methods
COMP25111	Operating Systems	10	Computer Architecture
COMP28112	Distributed Computing	10	Web and Distributed Systems
BIOL21332	Motor Systems	10	None
BIOL21341	Sensory Systems	10	None
COMP29220	Cognitive Neuroscience, Perception, Action, and Communication	20	None
SOST20022	Essentials of Survey Design & Analysis	20	None

### Level 2 - option pool 1

From this option pool choose 10 credits.

Code	Title	Credits	Theme
COMP25212	System Architecture	10	Computer Architecture
COMP28411	Computer Networks	10	Mobile Computing and Networks
COMP28512	Mobile Systems	10	Mobile Computing and Networks
BIOL21321	Membrane Excitability	10	None

### Level 3 options

You have 80 credits of compulsory course units listed in the table "compulsory units" below.

Out of the remaining 40 credits of free choice:

You must choose a minimum of 10 credits of optional COMP course units from option pools 1 and 2 below.

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

### 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
COMP33512	User Experience	10	Software Engineering
COMP33711	Agile Software Engineering	10	Agile Methods

SOST30022	Advanced Social Network Analysis	20	None
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### Level 3 - option pool 1

From this option pool choose 30 credits.

Code	Title	Credits	Theme
COMP31111	Verified Development	10	Rigorous Development
COMP31212	Concurrency and Process Algebra	10	Rigorous Development
COMP33411	Software Design using Patterns	10	Software Engineering
COMP33812	Software Evolution	10	Agile Methods
COMP34411	Natural Language Systems	10	Natural Language, Representation and Reasoning
COMP36512	Compilers	10	Computer Languages
COMP38120	Documents, Services and Data on the Web	20	Web and Distributed Systems

### Level 3 - option pool 2

From this option pool choose 20 credits.

Code	Title	Credits	Theme
BIOL31681	Clocks, Sleep & the Rhythms of Life	10	None
BIOL31691	Learning, Memory & Cognition	10	None
BIOL31732	Developmental Neurobiology	10	None
MCEL30031	Enterprise Management for Computer Scientists	10	None
MCEL30032	Managing Finance in Enterprises for Computer Scientists	10	None
PSYC31122	Emotion	20	None
PSYC31132	Cases in Clinical Neuropsychology	20	None
PSYC31142	The Psychology of Time	10	None
SOAN30811	Anthropology of Vision, Memory and the Senses	20	None
SOST30031	Modelling Social Inequality	20	None

Code	Title	CO	A1	A2	A3	A4	A5	A6	A7	A8	B1	B2	B3	B4	B5	C1	C2	C3	C4	C5	C6	C7	C8	C9	D1	D2	D3	D4	D5	D6	D7	D8	D9	D10	
BIOL10832	Excitable Cells	C																																	
BIOL21321	Membrane Excitability	O																																	
BIOL21332	Motor Systems	C																																	
BIOL21341	Sensory Systems	C																																	
BIOL31681	Clocks, Sleep & the Rhythms of Life	O																																	
BIOL31691	Learning, Memory & Cognition	O																																	
BIOL31732	Developmental Neurobiology	O																																	
COMP10120	First Year Team Project	C																																	
COMP15111	Fundamentals of Computer Architecture	C			DA															D	D														
COMP16121	Object Oriented Programming with Java 1	C		DA																DA							DA	DA							
COMP16212	Object Oriented Programming with Java 2	C		DA							DA	DA	DA						D	DA							D	D	D						
COMP18112	Fundamentals of Distributed Systems	C		DA									DA																						
COMP19120	Brain, Cognition, Sensation, Perception, Language and Communication	C					D	D	D	D	D	D	D		D				D	D				D	D		D	D					D		
COMP23111	Fundamentals of Databases	C			D	DA		D	DA	DA	DA	DA					DA							DA		DA	DA								
COMP23420	Software Engineering	C	D	D	D					D	D	D				D	D	D	D	D	D			DA	D	D	D	D							
COMP25111	Operating Systems	C	D	D						D	D	D			D					D					D		D	D							
COMP25212	System Architecture	O		DA						DA	DA	DA								DA															
COMP28112	Distributed Computing	C																																	
COMP28411	Computer Networks	O		D							D									D	D							D	D	D					
COMP28512	Mobile Systems	O	DA	DA	DA					DA	DA	DA				DA	DA						DA				DA			DA				DA	
COMP29220	Cognitive Neuroscience, Perception, Action, and Communication	C					D	D	D	D	D	D	D		D				D	D				D	D		D	D					D		
COMP30030	3rd Year Project (Joint Hons 30 Credits)	C									D	D	D		D	D	D							D	D	D	D	D							
COMP31111	Verified Development	O	DA		DA						DA																							DA	
COMP31212	Concurrency and Process Algebra	O	D	D			D				D		D							D													D		
COMP33411	Software Design using Patterns	O		D		D					D	D	D							D															
COMP33512	User Experience	C	DA	D	D						DA	DA	DA							D														DA	
COMP33711	Agile Software Engineering	C		DA	DA	DA		DA	DA	DA	DA	DA	DA							DA		D					DA						DA	DA	
COMP33812	Software Evolution	O		DA	DA						DA	DA																							
COMP34411	Natural Language Systems	O		DA			DA				DA	DA							DA														DA		
COMP36512	Compilers	O		D	D		D				D	D																							
COMP38120	Documents, Services and Data on the Web	O					DA		D		D	D				D	D				D														
MCEL30031	Enterprise Management for Computer Scientists	O																																	
MCEL30032	Managing Finance in Enterprises for Computer Scientists	O																																	
PSYC10100	Research Methods	C																																	
PSYC31122	Emotion	O																																	
PSYC31132	Cases in Clinical Neuropsychology	O																																	
PSYC31142	The Psychology of Time	O																																	
SOAN30811	Anthropology of Vision, Memory and the Senses	O																																	
SOST20022	Essentials of Survey Design & Analysis	C																																	
SOST30022	Advanced Social Network Analysis	C																																	





## **Mechanisms for programme revision**

Course units are reviewed annually by the Undergraduate Committee, as part of the Annual Review process, taking into account the results and comments from Course Unit Evaluation Questionnaires. Input is also received from the Teaching Assessment Panel, which has a responsibility for monitoring teaching quality in the School; similar processes are followed in the other participating Schools.

Programmes have been reviewed regularly by groups created specifically for this purpose; the last major review resulted in a new programme portfolio design which started in the first year in 2008-9. The responsibility for leadership of programme review is now the in the hands of the Director of Teaching Strategy (currently Dr Steve Pettifer) who chairs a School Teaching Strategy Committee. On the commencement of each new review, input will be sought from all participating Schools.