

Course Specification

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Produced By:	Oliver Jones
Status:	Validated

Core Information

Awarding Body / Institution:	University of Wolverhampton		
School / Institute:	School of Mathematics and Computer Science		
Course Code(s):	CS020H01UV	Full-time	3 Years
	CS020H31UV	Part-time	6 Years
Course Title:	BSc (Hons) Computer Science (Smart Technologies)		
Hierarchy of Awards:	Bachelor of Science with Honours Computer Science (Smart Technologies) Bachelor of Science Computer Science (Smart Technologies) Diploma of Higher Education Computer Science (Smart Technologies) Certificate of Higher Education Computer Science University Statement of Credit University Statement of Credit		
Language of Study:	English		
Date of DAG approval:	31/May/2017		
Last Review:	2015/6		
Course Specification valid from:	2015/6		
Course Specification valid to:	2021/2		

Academic Staff

Course Leader:	Mr Alix Bergeret
Head of Department:	Dr Kevan Buckley

Course Information

Location of Delivery:	University of Wolverhampton
Category of Partnership:	Not delivered in partnership
Teaching Institution:	University of Wolverhampton
Open / Closed Course:	This course is open to all suitably qualified candidates.

Entry Requirements:

Entry requirements are subject to regular review. The entry requirements applicable to a particular academic year will be published on the University website (and externally as appropriate e.g. UCAS)

2017 Entry

- A Level minimum of BB or CDD.
- BTEC National Diploma grade MMP, BTEC National Certificate grade DM
- BTEC QCF Extended Diploma grade MMP, BTEC QCF Diploma grade DM
- Access to HE Diploma full award (Pass of 60 credits - of which a minimum of 45 credits must be at level 3 including 18 at Merit or Distinction).
- Applicants will normally be expected to hold GCSE English and Maths at grade C+/4 or equivalent
- If you've got other qualifications or relevant experience, please contact [The Gateway](#) for further advice before applying.
- International entry requirements and application guidance can be found [here](#)
- Successful completion of the foundation year of our [BSc \(Hons\) Science and Engineering with Foundation Year](#) guarantees entry on to this course
- Successful completion of the [International Foundation Year in Science and Engineering](#) guarantees entry on to this course

Distinctive Features of the Course:

Our school has invested heavily in dedicated labs, equipment and staff training with regards to smart technologies and The Internet of Things. Students will acquire skills related to autonomous vehicles, home automation systems and micro-controllers, and have the opportunity to apply those skills to real life projects.

Educational Aims of the Course:

The majority of computers in the modern world are not in laboratories or sitting on desks. They are in our pockets, televisions, cars, fridges even. In the last decade, we have become increasingly connected with, and through, these computers, no longer tethered by wires. Exciting developments such as driverless cars, augmented reality and the internet of things only scratch the surface of what might be possible as technology progresses.

The Smart Technology degree is built to inspire the next generation of technology designers and architects. Working at the confluence of hardware, software and communications, you'll learn how to sense data, manipulate information and interact with the world around us, finding innovative ways to integrate technology into everyday lives.

Intakes:

September

Major Source of Funding:

Tuition Fees:

Tuition fees are reviewed on an annual basis. The fees applicable to a particular academic year will be published on the University website.

Year	Status	Mode	Amount
2017/8	H	Full Time / Sandwich	£9250.00
2017/8	EU	Full Time / Sandwich	£9250.00
2017/8	Overseas	Full Time / Sandwich	£11475.00
2017/8	H	Part Time	£2835.00
2017/8	EU	Part Time	£2835.00
2017/8	Overseas	Part Time	£5738.00
2018/9	H	Full Time / Sandwich	£9250.00
2018/9	EU	Full Time / Sandwich	£9250.00
2018/9	Overseas	Full Time / Sandwich	£11700.00
2018/9	H	Part Time	£2925.00
2018/9	Overseas	Part Time	£5850.00
2018/9	EU	Part Time	£2925.00
2019/0	H	Full Time / Sandwich	£9250.00
2019/0	EU	Full Time / Sandwich	£9250.00
2019/0	Overseas	Full Time / Sandwich	£12000.00
2019/0	H	Part Time	£2975.00
2019/0	Overseas	Part Time	£6000
2019/0	EU	Part Time	£2975.00

PSRB:

None

Course Structure:

September (Full-Time)

Year 1

Module	Title	Credits	Period	Type
4CS001	Introductory Programming And Problem Solving	20	SEM1	Core
4CS015	Fundamentals of Computing	20	SEM1	Core
4CI018	Academic Skills and Team-based Learning	20	SEM1	Core
4CS017	Internet Software Architecture	20	SEM2	Core
4MM013	Computational Mathematics	20	SEM2	Core
4CS016	Embedded Systems Programming	20	SEM2	Core

September (Full-Time)

Year 2

Module	Title	Credits	Period	Type
5CS026	Applied Analogue Electronics	20	SEM1	Core
5CS032	Computer Networking	20	SEM1	Core
5CS023	Web Development	20	SEM1	Core
5CS028	Embedded Programming and Smart Systems	20	SEM2	Core
5CS029	Sensors Actuators and Smart Environments	20	SEM2	Core

For this option group you must choose a minimum of 20 credits and a maximum of 20 credits

5CS024	Collaborative Development	20	SEM2	
5CS016	Professional Experience and Development	20	SEM2	

September (Full-Time)

Year 3

Module	Title	Credits	Period	Type
6CS014	Complex Systems	20	SEM1	Core
6CS026	Systems Architecture and Internet of Things	20	SEM1	Core
6CS012	Artificial Intelligence and Machine Learning	20	SEM2	Core
6CS027	Secure Mobile Application Development	20	SEM2	Core
6CS015	Project and Professionalism with Smart Artefact	40	YEAR	Core

Learning, Teaching and Assessment

Academic Regulations Exemption:

Section 5.2.3 - Exemption to include specialist modules at Level 5 in order to prepare students for progression to Level 6

Approved by AFRSC on 6th June 2016.

Reference Points:

The course is designed with reference to the most up-to-date QAA Subject Benchmark for Computing and the accreditation requirements of BCS The Chartered Institute for IT. In addition reference has also been made to;

- Quality Code - [Part A: Setting and Maintaining Academic Standards](#). Including;
- [Qualifications Frameworks](#)
- [Characteristics Statements](#)
- [Credit Frameworks](#)
- [Subject Benchmark Statements - Computing](#)
- Quality Code - [Part B: Assuring and Enhancing Academic Quality](#)
- [University Policies and Regulations](#)
- [Equality Act \(2010\)](#).

Learning Outcomes:

CertHE Course Learning Outcome 1 (CHECLO1)

Demonstrate knowledge of the underlying concepts and principles associated with your area(s) of study, and an ability to evaluate and interpret these within the context of that area of study.

CertHE Course Learning Outcome 2 (CHECLO2)

Demonstrate an ability to present, evaluate and interpret qualitative and quantitative data, in order to develop lines of argument and make sound judgements in accordance with basic theories and concepts of your subject(s) of study.

CertHE Course Learning Outcome 3 (CHECLO3)

Evaluate the appropriateness of different approaches to solving problems related to your area(s) of study and/or work.

CertHE Course Learning Outcome 4 (CHECLO4)

Communicate the results of your study/work accurately and reliably, and with structured and coherent arguments.

CertHE Course Learning Outcome 5 (CHECLO5)

Demonstrate the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility.

DipHE Course Learning Outcome 1 (DHECLO1)

Demonstrate knowledge and critical understanding of the well-established principles of your area(s) of study, and of the way in which those principles have developed with an understanding of the limits of your

knowledge, and how this influences analyses and interpretations based on that knowledge.

DipHE Course Learning Outcome 2 (DHECLO2)

Demonstrate the ability to apply underlying concepts and principles outside the context in which they were first studied, including, where appropriate, the application of those principles in an employment context.

DipHE Course Learning Outcome 3 (DHECLO3)

Demonstrate knowledge of the main methods of enquiry in the subject(s) relevant to the named award, and ability to evaluate critically the appropriateness of different approaches to solving problems in the field of study.

DipHE Course Learning Outcome 4 (DHECLO4)

Use a range of established techniques to initiate and undertake critical analysis of information, and to propose solutions to problems arising from that analysis.

DipHE Course Learning Outcome 5 (DHECLO5)

Effectively communicate information, arguments and analysis in a variety of forms to specialist and non-specialist audiences, and deploy key techniques of the discipline effectively.

DipHE Course Learning Outcome 6 (DHECLO6)

Demonstrate the qualities and transferable skills necessary for employment, requiring the exercise of personal responsibility and decision-making and undertake further training, developing existing skills and acquire new competences that will enable them to assume significant responsibility within organisations.

Ordinary Degree Course Learning Outcome 1 (ORDCLO1)

Apply appropriate theory, tools and techniques (e.g. theory and practice of programming, object-oriented design and analysis, design and construction of data systems, concurrent and distributed systems) to the analysis, design and synthesis of solutions to requirements in the domain of Computer Science.

Ordinary Degree Course Learning Outcome 2 (ORDCLO2)

Demonstrate mastery of the essential facts, concepts, principles, theories and practices enabling graduate employment in applications of Computer Science (e.g. Software development, media computing, systems analysis).

Ordinary Degree Course Learning Outcome 3 (ORDCLO3)

Demonstrate a range of transferable skills in: problem solving; communication; project management; working individually and in teams; self-management; and the ability to gather, evaluate and reflect on information from relevant sources and synthesise new knowledge and solutions to requirements in the domain of applications of Computer Science.

Ordinary Degree Course Learning Outcome 4 (ORDCLO4)

Demonstrate a range of social, legal, ethical and professional skills required for continuing professional development in the Computer Science Discipline within a world-wide context.

Ordinary Degree Course Learning Outcome 5 (ORDCLO5)

Apply a full understanding, knowledge and experience of the principles of Smart Technologies (e.g. artificial

intelligence, control, wireless sensor networks, embedded systems and internet of things) and its applications to the design and production of smart technologies.

Honours Degree Course Learning Outcome 1 (DEGCLO1)

Apply appropriate theory, tools and techniques (e.g. theory and practice of programming, object-oriented design and analysis, design and construction of data systems, concurrent and distributed systems) to the analysis, design and synthesis of solutions to requirements in the domain of Computer Science.

Honours Degree Course Learning Outcome 2 (DEGCLO2)

Demonstrate mastery of the essential facts, concepts, principles, theories and practices enabling graduate employment in applications of Computer Science (e.g. Software development, media computing, systems analysis).

Honours Degree Course Learning Outcome 3 (DEGCLO3)

Demonstrate a range of transferable skills in: problem solving; communication; project management; working individually and in teams; self-management; and the ability to gather, evaluate and reflect on information from relevant sources and synthesise new knowledge and solutions to requirements in the domain of applications of Computer Science.

Honours Degree Course Learning Outcome 4 (DEGCLO4)

Demonstrate a range of social, legal, ethical and professional skills required for continuing professional development in the Computer Science Discipline within a world-wide context.

Honours Degree Course Learning Outcome 5 (DEGCLO5)

Apply a full understanding, knowledge and experience of the principles of Smart Technologies (e.g. artificial intelligence, control, wireless sensor networks, embedded systems and internet of things) and its applications to the design and production of smart technologies.

Overview of Assessment:

Module	Title	Course Learning Outcomes
4CI018	Academic Skills and Team-based Learning	CHECLO1, CHECLO2, CHECLO3, CHECLO4, CHECLO5
4CS001	Introductory Programming And Problem Solving	CHECLO1, CHECLO2, CHECLO3, CHECLO5
4CS014	Team-based Learning Project	CHECLO1, CHECLO2, CHECLO3, CHECLO4, CHECLO5
4CS015	Fundamentals of Computing	CHECLO1, CHECLO2, CHECLO3, CHECLO4, CHECLO5
4CS016	Embedded Systems Programming	CHECLO1, CHECLO4, CHECLO5
4MM013	Computational Mathematics	CHECLO1, CHECLO2, CHECLO3, CHECLO4
5CS016	Professional Experience and Development	DHECLO1, DHECLO2, DHECLO3, DHECLO5, DHECLO6
5CS023	Web Development	DHECLO1, DHECLO2, DHECLO4, DHECLO5, DHECLO6
5CS024	Collaborative Development	DHECLO1, DHECLO2, DHECLO3, DHECLO5, DHECLO6
5CS026	Applied Analogue Electronics	DHECLO1, DHECLO2, DHECLO3, DHECLO4, DHECLO6
5CS028	Embedded Programming and Smart Systems	DHECLO1, DHECLO2, DHECLO3, DHECLO4, DHECLO5
5CS029	Sensors Actuators and Smart Environments	DHECLO1, DHECLO2, DHECLO3, DHECLO4, DHECLO5
5CS032	Computer Networking	DHECLO1, DHECLO2, DHECLO3, DHECLO4, DHECLO6
5MM006	Industrial Placement	DHECLO1, DHECLO2, DHECLO3, DHECLO4, DHECLO5, DHECLO6
6CS012	Artificial Intelligence and Machine Learning	DEGCLO1, DEGCLO2, DEGCLO3, DEGCLO4, DEGCLO5, ORDCLO1, ORDCLO2, ORDCLO3, ORDCLO4, ORDCLO5
6CS014	Complex Systems	DEGCLO1, DEGCLO2, DEGCLO3, ORDCLO1, ORDCLO2, ORDCLO3
6CS015	Project and Professionalism with Smart Artefact	DEGCLO1, DEGCLO2, DEGCLO3, ORDCLO1, ORDCLO2, ORDCLO3
6CS026	Systems Architecture and Internet of Things	DEGCLO1, DEGCLO2, DEGCLO3, ORDCLO1, ORDCLO2, ORDCLO3
6CS027	Secure Mobile Application Development	DEGCLO1, DEGCLO2, DEGCLO3, ORDCLO1, ORDCLO2, ORDCLO3

Teaching, Learning and Assessment:

You will engage with a range of learning activities which will include lectures, tutorials, workshops and on-line forums and in class discussions. The learning activities on your course will develop distinctive graduate attributes that will make you stand out and enhance your employability. These skills will be embedded into the curriculum throughout your course. Examples include;

Digitally Literacy: All Computer Science graduates will be users of advanced technologies. However, on your course you will develop your skills to encompass literacy more fully such as learning how to find information and how to take best advantage of digital resources and the Internet to make you effective in the Information Age.

Global Citizenship: On each level of your course you will learn about social, legal and ethical aspects of Computing, which will broaden your understanding of the way the world works and how communication and collaboration are evolving.

Knowledgeable and Enterprising: Throughout your course you will build up your professional and employability skills and learn to apply the knowledge you have acquired in an enterprising way. You will

constantly nurture your own intellectual curiosity. The tools, methodologies and techniques that you will learn have been carefully selected to prepare you with the skills that employers demand and the opportunities for work based learning and placements will allow you to gain the vital experience that they often expect.

Learning and Teaching Methods:

This data indicates the proportion of time in each year of study that students can expect to engage in the following activities (expressed as a percentage for each level).

Level	Teaching	Independent	Placement
4	23	77	0
5	24	76	0
6	24	76	0

Assessment Methods:

This data indicates the proportion of summative assessment in each year of study that will derive from the following: (expressed as a percentage for each level).

Level	Written Exams	Practical Exams	Coursework
4	17	0	83
5	0	0	100
6	0	0	100

Student Support:

University provided support:

As well as providing general counselling support the University Counselling Service provides short courses on topics such as "Self Confidence", "Stress Management and Relaxation" and "Life Skills". They also provide study skills and academic support, providing short courses such as provide help in areas such as "Writing and Assignment Skills", "Exam Techniques", "Enhancing Professional Skills", "Personal Development Planning" and "Making Choices for the Future".

University Learning Centres provide general academic skills support to all students. You can make an appointment with a study skills advisor for advice on areas such as academic writing, assignment planning, exam preparation, and time management. In addition, there is a regular timetable of drop-in and bookable workshops covering information and digital literacy skills, including academic referencing. School of Computing and IT students are supported by a designated subject librarian who is available to support research and project work.

Course support:

At the start of each year of your course you will be assigned a Personal Tutor who will guide you through the induction process and provide support and academic counselling throughout the year on an appointment basis. They should be able to offer you advice and guidance to help you liaise with other staff and support facilities in the School and University. You should meet your Personal Tutor at least 3 times a year, which must include meetings that you are invited to at critical points in your course.

The Personal Tutor provides academic counselling and will be accessible throughout the week on a drop-in or appointment basis to discuss timetables, requests for extensions, requests for extenuating circumstances, general concerns about study and student life and general programme planning.

The Personal Tutor will act as a first point of contact in relation to leave of absence (including returning after leave), withdrawal, transferring to another course (internal and external) and changes to mode of attendance. Your Course Leader will be available thereafter for meetings by appointment to discuss leave of absence, withdrawal, transferring to another course (internal and external), changes to mode of attendance, returning after leave of absence and direct entrants.

Subject support:

Tutorials, workshops, seminars and meetings - provide the primary opportunities for students to interact with staff on topics relating to modules. All modules provide at least one of these forms of face-to-face support. Formative feedback - tutors provide personalised written feedback on most summative assessments. The mechanism for feedback from purely formative tasks varies between assessments, but will always be provided in some form. Online formative tasks often provide feedback straight away. On occasions tutors may provide generalised verbal feedback to the whole class on points relating to an assessment. Assessment and subject-based surgeries provide additional student support for subjects that students often need extra help with. They are often concentrated around the times when assessments take place. Revision sessions are provided for many modules that have exam-like tests and enable you to interact with tutors to review parts of the course. Mock exams and tests may provide opportunities to experience an examination environment before the final summative test and give you feedback on your understanding.

Employability in the Curriculum:

Many of our graduates enter jobs at the technical end of the computer science and computer engineering spectrum; hardware and embedded technology developers, control system engineers, systems architects, network administrators and technical computing staff. The list of possible employers is constantly growing and evolving as we find new and innovative uses for technology, but we've sent graduates to the aviation industry, the automotive industry, the renewable power industry and security services, to name but a few. Other graduates have set up their own companies, moved into teaching, chosen to study a postgraduate qualification or entered the world of academic research.



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