ASTON UNIVERSITY PROGRAMME SPECIFICATION

Programme Title	Computing Science and Mathematics
UCAS/JACS Code	G400
School/Subject Area	SEAS. Computer Science and Mathematics
Final Award	BSc Honours
Interim Awards	Certificate of Higher Education, Diploma of Higher Education
Mode(s) of Study	Sandwich
Normal Length of Programme	4 years sandwich
Total Credits	480
Programme Accredited By	N/A
Programme Last Accredited	
Accreditation Frequency	
Dates Programme Specification Written and Revised	January 2012, Sept 2012

Education Aims of the Programme	General aims • To provide a learning experience that is intellectually challenging, relevant, stimulating and enjoyable. • To make students aware of the need for independent learning with an appreciation that their skills will need updating continuously through their professional life. • Enable students opting for a sandwich placement in computing to enhance their career preparation through a period of structured professional training. • To prepare students for higher study or a career in a cross-disciplinary area. • To produce graduates who are highly motivated, confident, mature and keenly sought by potential employers in a modern technological and commercial society. Subject specific aims • Provide a participation route leading to professional computing employment that is accessible to students who have demonstrated good intellectual aptitude rather than necessarily subject-specific preparation. • Produce Graduate Software Developers who specialize in object-oriented software development. • Develop practical information systems engineering capability based on well-founded principles. • To provide a broad overview of three main strands of mathematics: pure, applied and applicable. • To provide an introduction to appropriate, advanced and rigorous mathematics at the undergraduate level.
Relevent Subject Benchmark Statements and other External and Internal Reference Points used to inform programme outcomes	• Framework for Higher Education Qualifications • Quality Assurance Agency for Higher Education subject benchmark statement for Computing, and for for Mathematics, Statistics and Operational Research • Expertise of members of staff • External examiners • Industry • Professional approval requirements of the British Computer Society • Curriculum recommendations of the Association for Computing Machinery • SFIA: Skills Framework for the Information Age

Programme Structures and Requirements: Levels, Modules and Credits **Stage 1**				
Module Title	**Credits**	**Level**	**Module Code**	**Core**
Calculus and Ordinary Differential Equations	20	4	AM10CO	Core
Transition Mathematics	20	4	AM10TM	Core
Vector Algebra and Geometry	20	4	AM10VG	Core
Java Programming Foundations (CB)	20	4	CS1020	Core
Information Systems and Databases	20	4	CS1050	Core
Introduction to Computer Systems	10	4	CS1170	Core
Internet Computing	10	4	CS1240	Core
TOTAL	120			

Programme Structures and Requirements: Levels, Modules and Credits **Stage 2**				
Module Title	**Credits**	**Level**	**Module Code**	**Core**
Introduction to Analysis	10	4	AM10IA	Core
Statistics and Probability	10	4	AM10SP	Core
Numerical Methods I	10	5	AM20IM	Core
Linear Mathematics	10	5	AM20LM	Core
Multivariate Calculus	10	5	AM20MC	Core
Mathematical Methods	10	5	AM20MM	Core
Software Lifecycle and Design	20	5	CS2090	Core
Professional and Social Aspects of Computing	10	5	CS2160	Core
Human-Computer Interaction	10	5	CS2260	Core
Java Program Construction	10	5	CS2300	Core
Internet Applications and Techniques	10	5	CS2410	Core
TOTAL	120			

Programme Structures and Requirements: Levels, Modules and Credits **Stage 3**				
Module Title	**Credits**	**Level**	**Module Code**	**Core**
TOTAL	120			

Programme Structures and Requirements: Levels, Modules and Credits **Stage F**				
Module Title	**Credits**	**Level**	**Module Code**	**Core**
Individual Project	40	6	CS3010	Core
TOTAL	120			

Programme Outcomes, Learning and Teaching and Assessment Strategies			
Knowledge and Understanding			
	On successful completion of their programme students, are expected to have knowledge and understanding of:	**Learning, Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated**	
		Learning and Teaching Methods	**Assessment Methods**
1	Basic concepts and principles of information systems engineering (ISE) in general, but emphasising software and application technologies	A mixture of formal lectures, tutorial classes, computing laboratory classes, independent practical work associated with taught modules, independent study. For the sandwich option, an agreed programme of professional experience and training.	Knowledge and understanding are assessed through unseen examinations and (particularly in the case of (2)) through coursework reports. Assessment of the sandwich option is based on: • a reflective log-book kept by the student • an analytical final report written by the student • reports by an academic supervisor, taken together with the employers views.
2	Analysis, design and implementation methods applicable to ISE		
3	(Sandwich students who opt for a computing placement only) The relevance of the programmes discipline-specific and generic content to the world of work		
4	The skills and attitudes on which pure mathematics is based through a solid foundation in algebra and analysis.		
5	The principles and methods of mathematics to a range of physical and data based models.		
6	A range of numerical\computational methods, balancing the practical applications with appropriate underpinning.		
7	A range of mathematical skills and techniques for problem formulation and solution.		

Intellectual Skills			
	On successful completion of their programme students, are expected to have knowledge and understanding of:	**Learning, Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated**	
		Learning and Teaching Methods	**Assessment Methods**
1	Analyse requirements of computing problems and design solutions	Intellectual skills are developed through formal lectures (often including suitable case studies), tutorial classes, and practical work (both assessed and unassessed) associated with taught modules.	Unseen written examinations. Coursework submissions relating to design exercises. Presentations
2	Apply important concepts in mathematics.		
3	Apply the principles and methods of mathematics.		
4	Critically appraise different methods and techniques of problem-solving, assessing their effectiveness and applicability.		
5	Work independently by taking responsibility for the management of their own study and learning.		

Professional Skills			
	On successful completion of their programme students, are expected to have knowledge and understanding of:	**Learning, Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated**	
		Learning and Teaching Methods	**Assessment Methods**
1	Construct, test and document computer software	Formal lectures (including suitable case studies). Tutorial classes. Practical work (both assessed and unassessed) associated with taught modules. Placement (if undertaken)	Unseen written examinations. Coursework submissions relating to design exercises. Presentations Placement reports (if placement is undertaken)
2	Use a variety of programming languages, software tools and environments		
3	Apply Internet technology		
4	Prepare technical reports and presentations		
5	Use appropriate diagrammatic notations in design work and in reports.		
6	Fulfil the requirements of Associate membership of the Institute of Mathematics and its Applications by holding a combined honours degree in mathematics.		
7	Demonstrate comprehension of the relevant modern industrial environment (if a Placement is undertaken).		
8	Solve problems using mathematical software		
9	To implement, test and evaluate a given technique on real data, using a computer if necessary		
10	Apply numerical algorithms to real-world applications		

Transferable Skills			
	On successful completion of their programme students, are expected to have knowledge and understanding of:	**Learning, Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated**	
		Learning and Teaching Methods	**Assessment Methods**
1	Ability to communicate effectively (written, oral and through ICT techniques)	Skills are developed through tutorial, practical work for taught modules and the professional placement option.	Examinations, coursework assessments, presentations and placement reports (if placement undertaken) all provide direct or indirect evidence of the level of skills acquired.
2	Problem solving skills		
3	ICT skills		
4	Time management skills		
5	Analytical skills		
6	Presentational skills		
7	Ability to use appropriate mathematical software		

Entry Requirements	Typical A Level Offers: AAB-ABB at GCE A level/AVCE Combination of 2 A level and 2 AS level subjects accepted Additional AS levels are taken into account when confirming places SPECIFIC SUBJECT REQUIREMENTS: GCE A level: Mathematics grade A/B GENERAL STUDIES ACCEPTED? Yes BTEC, IB, ACCESS, SCOTTISH/IRISH QUALIFICATIONS: All accepted. BTEC: 13 Units at grade Distinction. IB: 31-33 points
Programme Regulations	**Attendance requirements** Sandwich students are normally required to attend the University for the first, second and third term of the first, second and fourth of four consecutive academic years, and undertake an integrated programme of professional training between the second and fourth academic years. The approved specification for any particular module may include assessment elements that require attendance at scheduled classes. **Professional Training** The programme of professional training undertaken by a sandwich student must be approved by the Associate Dean for Undergraduate Programmes and be of at least 40 weeks duration, excluding any periods of vacation. It will be assessed and contribute to 10% of the overall degree classification. **Specific assessment requirements for modules** The module *CS1020 Java Programming Foundations* is fundamental to the entire programme of study and cannot be condoned for progression on the Honours Degree, but may be condoned for progression on the Ordinary Degree. In the final stage of the programme, the Individual Project (CS3010) will be primarily supervised from within the Computer Science subject group. However, where there is significant mathematical content to the project, a second supervisor from the Mathematics subject group will be appointed. Aside from the Individual Project (CS3010) the remaining 80 credits in the final stage of the programme must contain at least 30 credits from each of the Computing and Mathematics subjects. **Requirements for the Ordinary Degree** The modules taken in a particular stage of study by a student who has transferred to the Ordinary Degree are derived from those for the corresponding stage of the Honours Degree by omitting selected modules to reduce the credit requirement of the stage. The modules omitted must be approved by the Associate Dean for Undergraduate Programmes. Project module (CS3010) cannot be omitted.

This specification provides a concise summary of the main features of the programme and the threshold learning outcomes that a student might normally be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. **The individual modules included in the programme may differ from those included in this programme specification as our programmes are subject to continuous review**. Information on admissions requirements and career opportunities is available in the relevant prospectus. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the appropriate module guides and programme handbook(s) which are available to students on enrolment.