ASTON UNIVERSITY PROGRAMME SPECIFICATION

Programme Title	Mathematics with Computing
UCAS/JACS Code	G190
School/Subject Area	School of Engineering and Applied Science Mathematics
Final Award	BSc
Interim Awards	Certificate of Higher Education/Diploma of Higher Education
Mode(s) of Study	Full-time or Sandwich
Normal Length of Programme	3 (Full-time) or 4 years (Sandwich)
Total Credits	360 full-time or 480 sandwich (for Placement)
Programme Accredited By	N/A
Programme Last Accredited	
Accreditation Frequency	
Dates Programme Specification Written and Revised	March 2006, revised September 2008, revised September 2009, September 2011

Education Aims of the Programme	To prepare students for a career in academia or industry, primarily in mathematically interdisciplinary areas. To equip students with a wide range of analytical and computational tools which they can employ in a principled framework. To introduce students to the main streams of mathematics and to the use of computing as a means of deploying mathematical techniques. To provide a stimulating and challenging learning experience that will enable students to develop their analytical and computational skills, preparing them for the dynamic and ever changing environment of the information age. To offer students the opportunity to obtain relevant industrial experience by providing the option of a placement year.
Relevent Subject Benchmark Statements and other External and Internal Reference Points used to inform programme outcomes	• UK Quality Code Part A.1 (2011) • QAA benchmark standard for Mathematics, Statistics and Operational Research • Expertise of members of staff • Industry • School Strategic Plan

Programme Structures and Requirements: Levels, Modules and Credits **Stage 1**				
Module Title	**Credits**	**Level**	**Module Code**	**Core**
Academic Writing and Study Skills	10	4	AM10AS	Core
Calculus and Ordinary Differential Equations	20	4	AM10CO	Core
Mathematical Algorithms	10	4	AM10CP	Core
Introduction to Matlab	10	4	AM10IM	Core
Transition Mathematics	20	4	AM10TM	Core
Vector Algebra and Geometry	20	4	AM10VG	Core
Java Programming Foundations (CB)	20	4	CS1020	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 II	10	5	AM20CP	Core
Numerical Methods I	10	5	AM20IM	Core
Investigative Skills	10	5	AM20IS	Core
Linear Mathematics	10	5	AM20LM	Core
Multivariate Calculus	10	5	AM20MC	Core
Mathematical Methods	10	5	AM20MM	Core
Real Analysis	10	5	AM20RA	Core
Information Systems and Databases	20	4	CS1050	Core
Java Program Construction	10	5	CS2300	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**
Complex Analysis	20	6	AM30CA	Core
Partial Differential Equations	20	6	AM30PD	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	The mathematics of information handling and analysis.	• Lectures • Tutorials • Reading • Independent Study	• Lectures • Tutorials • Reading • Independent Study
2	The role of IT in commerce and industry, with a particular focus on large databases and distributed applications.		
3	The principled approach to data analysis and modelling.		
4	A range of numerical\computational methods, balancing the practical applications with appropriate underpinning.		
5	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	Use a principled approach to data analysis and modelling.	• Lectures • Tutorials	• Examinations • Coursework • Presentations
2	Design and build informatics applications.		
3	Critically appraise different methods and techniques of problem-solving, assessing their effectiveness and applicability.		
4	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	Demonstrate comprehension of the relevant modern industrial environment (if a Placement is undertaken).	• Lecture • Tutorials • Placement (if undertaken)	• Examinations • Coursework • Presentation • Placement Reports (if Placement undertaken)
2	Assimilate and use up to date information from a variety of sources.		
3	To implement, test and evaluate a given technique on real data, using a computer if necessary		
4	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	Communication skills (oral and written)	• Lecture • Tutorials • Computer laboratory sessions • On the job (if placement undertaken)	• Examinations • Coursework • Presentation • Placement Reports (if Placement undertaken)
2	Presentational skills		
3	Analytical skills		
4	Ability to use appropriate mathematical software		
5	The ability to learn independently.		

Entry Requirements	In addition to satisfying the general entry requirements, 320 points in 3 A-level subjects to include at least a grade A or B in Mathematics, or equivalent qualifications.
Programme Regulations	**Attendance requirements** Full-Time students are normally required to attend the University for nine terms over a period of three consecutive academic years. Sandwich students are normally required to attend the University for nine terms over a period of four consecutive academic years. **Industrial/Professional Placement** For Sandwich students only, the third stage is either the module *SEP001 EAS Study Placement Year* or *SEP002 EAS Industrial Placement Year*, each of which carries 120 credits.

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.