UNIVERSITY OF LEICESTER

Programme Specification (Undergraduate)

Date amended: July 2017

1. Programme Title(s) and UCAS code(s):

MComp Computer Science (G410)
MComp Computer Science with a Year Abroad
MComp Computer Science with a Year in Industry

2. Awarding body or institution:

University of Leicester

3. a) Mode of study:

Full-time

b) Type of study:

Campus-based

4. Registration periods:

The normal period of registration is four years (five years for the "Year Abroad" and "Year in Industry" variants).

The maximum period of registration is six years (seven years for the "Year Abroad" and "Year in Industry" variants).

5. Typical entry requirements:

320 to 340 points from three A2-levels (ABB or AAB). International Baccalaureate: Pass Diploma with 32 to 34 points.

6. Accreditation of Prior Learning:

APL will not be accepted for exemptions from individual modules, however may be considered for direct entry to year 2, on a case by case and subject to the general provisions of the University APL policy.

7. Programme aims:

The programme aims to:

- Provide students with an advanced education and training in computer science that includes both fundamental concepts and state-of-the-art trends, and also a very good indication of the breadth of the subject.
- Provide opportunities for students to learn a very wide range of skills in the analysis, design, specification, implementation, testing and documentation of computer software systems.
- To develop powers of critical analysis, skills in problem solving, written communication, and abilities in presentation to a high level.
- Provide students with extended experience of both team-based and individual project work.
- To develop skills that will enhance employment prospects, especially in the IT industry or other numerate disciplines.
- Allow students to gain familiarity with a wide variety of modern programming languages, and the underlying principles of programming paradigms (functional, object oriented, logical and so on).

- To develop scientific problem solving abilities, along with an appreciation for mathematical and scientific methods, that will provide a lifelong support for your career.
- To foster students' abilities to learn new subjects, and conduct research and scholarship, at levels and speeds that are more demanding than those typical of bachelor level programmes.
- To develop an appreciation of the necessity for rigorous subject foundations, and the need for logical arguments, that will also contribute to your lifelong skills.
- Ensure students will have expertise and understanding at a level where they can embark upon a high quality PhD research programme.

In addition to these aims, MComp Computer Science with a Year Abroad aims to:

- Enable students to experience modern Computer Science from an international perspective.
- Develop students' working knowledge of a language other than English.
- Provide students with an environment that will encourage a thoughtful and mature approach to all aspects of study and life, creating graduates with broad experiences and horizons.

In addition to these aims, MComp Computer Science with a Year in Industry aims to:

- Help place students on relevant industrial placements where they can gain first-hand experience of the requirements and opportunities of the computing industry in the UK.

8. Reference points used to inform the programme specification:

- Accreditation reports from the BCS.
- QAA Frameworks for Higher Education Qualifications in England Wales and Northern Ireland
- QAA Benchmarking for Computing (2007).
- QAA Developmental Engagement.
- QAA Institutional Report.
- University Learning Strategy.
- University Employability Strategy
- PDR report (January 2010).
- First Destination Survey.
- Student Feedback (2014)
- External Examiners' reports.

9. Programme Outcomes:

Intended Learning Outcomes	Teaching and Learning	How Demonstrated?
(a) Discipline specific knowledge and competencies		
(i) Mastery of an appropriate body of knowledge		
1. Demonstrate both recollection and understanding of computing factual knowledge, together with relevant scientific knowledge and concepts from logic, at levels which are equal to typical advanced masters programmes.	Lectures, surgeries, computer laboratories and problem classes. Also background reading and research.	Written examinations, assessed coursework, group and individual project presentations, individual project oral examinations and project reports.
2. Demonstrate recollection and understanding of advanced engineering principles, scientific principles and mathematical and logical theories in computing.	As above.	As above. Assessed coursework and project work.
3. Demonstrate appropriate management techniques.	Group work in modules, group project work.	
(ii) Understanding and application of key concepts and techniques		
1. Demonstrate advanced knowledge and understanding of computing at a mathematically and logically abstract (conceptual) level, and to apply this to the design and modeling of computing systems.	Lectures, surgeries, computer laboratories and problem classes, worksheets, project work.	Written examinations, assessed coursework, group and individual project presentations, individual project reports.
2. Demonstrate and apply the concept of logical structure and organization that pervade computing, and be able to generalize and specialize to achieve such structure. Apply these ideas in sophisticated modeling and design.	As above.	As above.
3. Understand and apply a wide range of theoretical principles, practices and tools of both mathematics/logic/science, and also software engineering, together with suitable processes and methodologies to determine strategies for solution; and create requirements, specifications and designs.	As above, with emphasis on all forms of project work.	As above, with emphasis on project assessments. Assessed laboratory work, group and individual project presentations, individual project reports
4. Design and construct, test & verify, and deliver complex medium scale software systems. Maintain systems. Make appropriate use of tools for such tasks.	Computer laboratories and project work.	
5. Undertake mathematical/scientific problem solving and practical engineering style problem solving.	Lectures, surgeries, computer laboratories and problem classes, worksheets, project work.	Written examinations, assessed coursework, group and individual project presentations, individual project reports.

(iii) Critical analysis of key		
1. Analyze customer problems, requirements and criteria, and hence plan and select an appropriate solution strategy.	Lectures, surgeries, problem classes, worksheets, group and individual project work.	Written examinations, assessed coursework, group and individual project presentations, group reports and individual project reports.
2. Understand customer needs, and budgets, undertaking suitable research. Ensure software solutions are fit-for-purpose. Be able to manage the complete engineering process and evaluate the end product, and to work with associated uncertainties.	As above.	As above.
3. Be able to recognize risks in the deployment and use of software systems.	As above.	As above.
(iv) Clear and concise presentation of material		
1. Write short accounts of advanced computing and scientific knowledge.	Worksheets, group and individual project work, private study.	Written examinations, assessed coursework, group and individual project presentations, and project reports.
2. Produce written and visual information in a variety of forms, chosen to maximize reader/audience impact and understanding.	As above.	As above
(v) Critical appraisal of evidence with appropriate insight		
1. Evaluate and appraise software systems, in terms of attributes and tradeoffs. Identify risks and safety concerns.	Lectures, surgeries, computer laboratories and problem classes. Also background reading and research.	Written examination, assessed coursework, group and individual project presentations, individual project oral examinations and reports.
2. Perform software testing, and critically evaluate and analyze test results. Evaluate whether a system meets the requirements, for future and for current use.	Computer laboratories and project work.	Assessed laboratory work, group and individual project presentations, individual project reports
3. Use relevant knowledge to appraise the commercial use and economic and long-term viability of computer systems.	As above.	As above.
(vi) Other discipline specific competencies		
1. Demonstrate knowledge and understanding of social, legal and ethical issues as required by computing professionals. Adopt and implement suitable professional and legal practice.	Lectures, surgeries, problem classes, worksheets, group and individual project work.	Written examination, assessed coursework, group project presentations and coursework.
2. Demonstrate knowledge and understanding of functional programming and logical principles of induction and type inference.	Lectures, surgeries, computer laboratories and worksheets.	Written examination, assessed coursework.
3. Solve advanced problems using principles from propositional and predicate logic, demonstrating a clear understanding of the scientific method of proving an hypothesis.	As above.	As above.

(b) Transferable skills		
(i) Oral communication		
1. Respond to technical questions with accurate and concise answers.	Lectures and surgeries. Project supervision. Problem classes.	Group and individual project presentations, individual project oral examinations.
2. Demonstrate fluent and sustained scientific, technical and business communication, supported by a variety of audio-visual aids.	Lectures and project supervision. Use of student learning center.	As above.
(ii) Written communication		
1. Demonstrate ability to write concise and accurate summaries of computing and scientific knowledge, and solutions to problems, in a variety of different formats.	Lectures, surgeries, computer laboratories and problem classes, worksheets, project work.	Written examinations, assessed coursework.
2. Produce properly structured, clear, advanced technical reports or dissertations.	Lectures and surgeries. Discussed in both group and individual project supervisions.	Group project assessed coursework and individual project reports.
(iii) Information technology		
1. Use a very broad range of software and IT tools, and to choose these appropriately for retrieval and management of information.	Lectures, surgeries and laboratories.	Assessed (laboratory) coursework.
2. Demonstrate a broad and deep understanding of many IT tools, and be able to adapt to new programming paradigms in the future.	As above.	As above.
(iv) Numeracy		
1. Demonstrate understanding of the concept of number.	Lectures, surgeries, computer laboratories and problem classes, worksheets.	Written examinations, assessed coursework.
2. Use analytical, quantitative, and graphical methods, and deploy elementary statistics.	As above, together with project work.	As above, along with group and individual project presentations
(v) Team working		
1. Work effectively as part of a team, and demonstrate ability to organize roles and manage time, undertake assigned tasks, and ensure final completion of a team project. Identify strengths and weaknesses of team members.	Lectures and project supervision. Use of student learning center.	Group project assessed coursework and presentations. Mini projects.

(vi) Problem solving		
1. Solve a variety of short problems through the integration of knowledge of mathematics, logic, algorithms and basic computing.	Lectures, surgeries and problem classes. Also covered in project supervisions.	Written examinations, assessed coursework, and project reports.
2. Use systematic analysis and design methods, and appropriate algorithms, to solve complex medium scale problems.	As above.	As above.
3. Analyze large-scale problems to produce suitable solutions with sensible economic and commercial compromises. Apply management techniques to allocate resources to projects.	As above.	Group and individual project presentations and reports.
(vii) Information handling		
1. Conduct significant background research and literature surveys, and summarize content from information sources.	Taught in lectures. Also covered in project supervisions.	Individual project reports.
2. Demonstrate a broad understanding of problems and issues that arise in the location, organization, processing and evaluation of data.	As above.	Written examinations, assessed coursework, and project reports.
3. Recognize the need for information, and work with fuzzy, limited and possibly contradictory information.	As above.	As above.
(viii) Skills for lifelong learning		
1. Demonstrate knowledge and understanding of professional and ethical issues, and aspects of the law, in the context of Computing Professionals.	Lectures, surgeries and problem classes. Also covered in project supervisions.	Written examinations, assessed coursework, and project reports.
2. Demonstrate independence and time management skills.	Project supervisions and research project work. Meeting coursework deadlines.	Project reports.
3. Design a personal work plan and be able to improve performance with a clear view of long-term professional development.	Project supervisions and research project work.	As above.

10. Progression points:

This programme follows the standard scheme of award and classification set out in Senate Regulation 5 modified as follows:

> In year 2 and year 3, students normally need to achieve an average mark of 55% and have no failed module in order to progress to the next year.

Students on with Industry degrees

- Should normally pass the first year at the first attempt, otherwise they will be transferred to the equivalent three year degree; and
- Should normally pass the second year at first sitting in January/June. A student who does not have a placement arranged by June, and who has to take resit exams will be transferred to the equivalent three year degree.

Degree classification is formally based on performance in years two and four only, but you will need to have satisfied the requirements described in the Industrial Placement Folder to be awarded the degree.

11. Scheme of Assessment
This programme follows the standard scheme of award and classification set out in Senate Regulation 5. If regulation 5.14(c) applies in relation to any of the modules CO1003, CO1005, CO1019 then failed marks must be no lower than 35% (rather than the normal 30%) in order for students to proceed and re-sit. Regulation 5.10 applies absolutely to CO2015 Software Engineering Project.

12. Special features:
Emphasis on blending long-term foundational knowledge with state-of-the-art technologies and current programming languages; Group Projects involving an external client wherever possible; Individual Projects with a number of structured milestones.

13. Indications of programme quality
British Computer Society Accreditation requires that individual projects be passed at the first attempt.

14. External Examiners
The details of the External Examiner(s) for this programme and the most recent External Examiners' reports can be found here.

Appendix 1: Programme structure (programme regulations)
Below

Appendix 2: Module specifications
See module specification database http://www.le.ac.uk/sas/courses/documentation

Appendix 3: Skills matrix

MComp COMPUTER SCIENCE

FIRST YEAR MODULES

SEMESTER 1

Core Modules		**Credits**
CO1003	PROGRAM DESIGN	20
CO1008	REQUIREMENTS ENGINEERING AND PROFESSIONAL PRACTICE	10
CO1012	DISCRETE STRUCTURES	10
CO1016	COMPUTER SYSTEMS	20
	Semester Total	**60**

SEMESTER 2

Core Modules		**Credits**
CO1001	LOGIC AND PROBLEM SOLVING	20
CO1005	DATA STRUCTURES AND DEVELOPMENT ENVIRONMENTS	20
CO1019	DATABASES AND WEB APPLICATIONS	20
	Semester Total	**60**

SECOND YEAR MODULES

SEMESTER 1

Core Modules		**Credits**
CO2001	USER INTERFACES AND HCI	10
CO2006	SOFTWARE ENGINEERING AND SYSTEM DEVELOPMENT	20
CO2012	SOFTWARE PROJECT MANAGEMENT AND PROFESSIONALISM	10
CO2011	AUTOMATA, LANGUAGES AND COMPUTATION	20
	Semester Total	**60**

SEMESTER 2

Core Modules		**Credits**
CO2008	FUNCTIONAL PROGRAMMING	10
CO2015	SOFTWARE ENGINEERING PROJECT	20
CO2016	MULTIMEDIA AND COMPUTER GRAPHICS	10
CO2017	OPERATING SYSTEMS, NETWORKS AND DISTRIBUTED SYSTEMS	20
	Semester Total	**60**

THIRD YEAR MODULES

SEMESTER 1

Core Modules		**Credits**
CO3015	COMPUTER SCIENCE PROJECT (PART 1)*	20
Optional Modules		
40 credits of options selected from:		
CO3007	COMMUNICATION AND CONCURRENCY	20
CO3094	SYSTEM MODELLING	20
CO3095	SOFTWARE MEASUREMENT AND QUALITY ASSURANCE	20
CO3098	WEB TECHNOLOGIES	20
	Semester Total	**60**

SEMESTER 2

Core Modules		**Credits**
CO3015	COMPUTER SCIENCE PROJECT (PART 2)*	20
Optional Modules		

40 credits of options selected from:

CO3002	ANALYSIS AND DESIGN OF ALGORITHMS	20
CO3091	COMPUTATIONAL INTELLIGENCE	20
CO3090	DISTRIBUTED SYSTEMS AND APPLICATIONS	20
CO3096	COMPRESSION METHODS FOR MULTIMEDIA	20
CO3099	CRYPTOGRAPHY AND INTERNET SECURITY	20
	Semester Total	**60**

FOURTH YEAR MODULES

SEMESTER 1

Core Modules **Credits**

CO4015	COMPUTER SCIENCE PROJECT (PART 1)*	15

Optional Modules

45 credits of options selected from:

CO4210	PERSONAL AND GROUP SKILLS**	15
CO4203	ADVANCED C++ PROGRAMMING	15
CO4205	ADVANCED SYSTEM DESIGN	15
CO4206	SYSTEM RE-ENGINEERING	15
CO4209	SOFTWARE RELIABILITY	15
CO4215	ADVANCED WEB TECHNOLOGIES	15
CO4217	AGILE CLOUD AUTOMATION	15
CO4219	INTERNET AND CLOUD COMPUTING	15
	Semester Total	**60**

SEMESTER 2

Core Modules **Credits**

CO4015	COMPUTER SCIENCE PROJECT (PART 2)*	15

Optional Modules

45 credits of optional modules selected from:

CO4210	PERSONAL AND GROUP SKILLS**	15
CO4200	ALGORITHMS FOR BIOINFORMATICS	15
CO4211	DISCRETE EVENT SYSTEMS	15
CO4212	GAME THEORY IN COMPUTER SCIENCE	15
CO4214	SERVICE-ORIENTED ARCHITECTURES	15
CO4216	SEMANTIC WEB	15
CO4218	FINANCIAL SERVICES INFORMATION SYSTEMS	15
CO4207	GENERATIVE DEVELOPMENT	15
	Semester Total	60

*TAKEN OVER TWO SEMESTERS

** ALL STUDENTS ARE REQUIRED TO TAKE CO4210 BUT MAY TAKE IT EITHER IN SEMESTER 1 OR IN SEMESTER 2.

MComp COMPUTER SCIENCE WITH A YEAR ABROAD

First and Second Year Modules

As for the first- and second-year of the MComp Computer Science degree.

Third Year Modules

The third year will be spent abroad taking approved courses either in an institution associated with the Computer Science Department via an ERASMUS bilateral agreement or in a university that has a Study Abroad exchange partnership agreement with the University of Leicester. Students will normally be required to complete the year and to reach a pass level of attainment in 60 credits of Computer Science modules Failure to do so will result in the student reverting to the four year MComp Computer Science degree. The marks awarded during the year abroad do not contribute to the final degree

classification.

Note: Transfer will be confirmed only after successful completion of the first year.

Fourth and Fifth Year Modules

As for the third and fourth years of the MComp Computer Science degree.

MComp COMPUTER SCIENCE WITH A YEAR IN INDUSTRY

First and Second Year Modules

As for the first- and second-year of the MComp Computer Science degree.

Third Year Modules

1. Students will work within a sponsoring company for one year between 1 July of the second year of the course and the start of the following year.
2. During their one-year placement students will undertake a programme of training and work experience which will be agreed by the sponsoring company and the University.
3. Students will be expected to keep a logbook recording their training and experience that is to be presented for approval to the sponsoring company and the University.
4. Students will be issued with a *Certificate of Industrial Studies* indicating successful completion of their placement. Students who do not satisfactorily complete their industrial placement will be transferred to the MComp Computer Science degree.

The Year in Industry does not contribute to the final degree classification.

Fourth and Fifth Year Modules

As for the third and fourth years of the MComp in Computer Science degree.