UNIVERSITY OF LEICESTER

Programme Specification (Undergraduate)

For students entering in 2017/18
Date amended: May 2018

1. Programme Title(s) and UCAS code(s):
BSc Computing (G405)
BSc Computing with a Year Abroad (G406)
BSc Computing with a Year in Industry (G407)

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 three years (four years for the "Year Abroad" and "Year in Industry" variants).

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

5. Typical entry requirements:
300 points normally including BBB from 6 or 12 unit awards.

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 education and training in computer science that includes both fundamental concepts and state-of-the-art trends, and also provides a good indication of the breadth of the subject.
- To provide opportunities for students to learn a 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.
- Provide students with 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 current programming languages.
- To develop an appreciation of the business and financial aspects of computing.
- Ensure students will have expertise and understanding at a level where they can embark upon a taught Masters programme in computing.

In addition to these aims, G406 BSc Computing with a Year Abroad aims to:

- Enable students to experience modern Computing 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, G407 BSc Computing 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.
- Enable students to use and develop the knowledge and skills gained during the first two years of the degree programme.

8. Reference points used to inform the programme specification:

- Accreditation reports from the British Computer Society.
- 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.
- NSS (2014)
- External Examiners' reports.

9. Programme Outcomes:

Intended Learning Outcomes	Teaching and Learning Methods	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.	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 engineering principles and mathematical theories in computing.	As above.	As above.
3. Demonstrate appropriate management techniques.	Group work in modules, group project work.	Assessed coursework and project work.
4. Demonstrate mastery of the core of an appropriate foreign language (G406)	Lectures, language laboratories and learning abroad.	University report.
5. Demonstrate understanding of the core elements of industrial practice and organization (G407).	Work placement.	Placement Report.

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
(ii) Understanding and application of key concepts and techniques		
1. Demonstrate knowledge and understanding of computing at a mathematically 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 concepts of structure and organization that pervade computing, and be able to generalize and specialize to achieve such structure. Apply these ideas in modeling and design.	As above.	As above.
3. Understand and apply the theoretical principles, practices and tools of 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.
4. Design and construct, test & verify, and deliver medium scale software systems. Maintain systems. Make appropriate use of tools for such tasks.	Computer laboratories and project work.	Assessed laboratory work, group and individual project presentations, individual project reports
5. Undertake practical engineering style problem solving and some theoretical problem solving.	Lectures, surgeries, computer laboratories and problem classes, worksheets, project work.	Written examinations, assessed coursework, group and individual project presentations, individual project reports.
6. Demonstrate ability to communicate some aspects of Computing in a foreign language. (G406)	Lectures and language laboratories.	University report.
7. Work as a computing engineer in an industrial or commercial setting. (G407)	Work placement.	Placement report.

(iii) Critical analysis of key issues		
1. Analyze customer problems, requirements and criteria, and hence plan and select an appropriate solution strategy. 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. 3. Be able to recognize risks in the deployment and use of software systems.	Lectures, surgeries, problem classes, worksheets, group and individual project work. As above. As above.	Written examinations, assessed coursework, group and individual project presentations, group reports and individual project reports. As above. As above.

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
(iv) Clear and concise presentation of material		
1. Write short accounts of computing knowledge 2. Produce written and visual information in a variety of forms, chosen to maximize reader/audience impact and understanding.	Worksheets, group and individual project work, private study. As above.	Written examinations, assessed coursework, group and individual project presentations, and project reports. 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. 2. Perform software testing, and critically evaluate and analyze test results. Evaluate whether a system meets the requirements, for future and for current use. 3. Use relevant knowledge to appraise the commercial use and economic and long- term viability of computer systems.	Lectures, surgeries, computer laboratories and problem classes. Also background reading and research. Computer laboratories and project work. As above.	Written examination, assessed coursework, group and individual project presentations, individual project oral examinations and reports. Assessed laboratory work, group and individual project presentations, individual project reports 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. 2. Demonstrate knowledge and understanding of financial and business computing.	Lectures, surgeries, problem classes, worksheets, group and individual project work. Lectures, surgeries, problem classes, worksheets	Written examination, assessed coursework, group project presentations and coursework. Written examination, assessed coursework.
(b) Transferable skills		
(i) Oral		
1. Respond to technical questions with accurate and concise answers. 2. Demonstrate fluent and sustained scientific, technical and business communication, supported by a variety of audio-visual aids. 3. Demonstrate core oral communication skills in a foreign language (G406).	Lectures and surgeries. Project supervision. Problem classes. Lectures and project supervision. Use of student learning center. Lectures and language laboratories.	Group and individual project presentations, individual project oral examinations. As above. University report.

Intended Learning Outcomes	Teaching and Learning Methods	How Demonstrated?
(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.
3. Demonstrate core written communication skills in a foreign language (G406).	Lectures, tutorials, language laboratory work.	University report.
(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 and reports.

(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, 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 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.

British Computer Society Accreditation requires that individual projects be passed at the first attempt.

With Industry variant

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

The 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 where ever 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 Examine

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

BSc COMPUTING

FIRST YEAR MODULES

SEMESTER 1

Core Modules		**Credits**
CO1003	PROGRAM DESIGN	20
CO1008	REQUIREMENTS ENGINEERING AND PROFESSIONAL PRACTICE	10
CO1012	DISCRETE STRUCTURES	10
Optional Modules		
Either		
CO1097	INTERNET COMPUTING	10
CO1098	INFORMATION MANAGEMENT	10
Or		
CO1097	INTERNET COMPUTING	10
FR1017	UNDERSTANDING CONTEMPORARY FRANCE 1	10
Or		
FR1017	UNDERSTANDING CONTEMPORARY FRANCE 1	10
FR1010	FRENCH LANGUAGE ADVANCED (YEAR LONG – 10 CREDITS PER SEMESTER)	20
Or		
FR1020	FRENCH LANGUAGE (BEGINNERS) 1	20
Semester Total		**60**

SEMESTER 2

Core Modules		**Credits**
CO1005	DATA STRUCTURES AND DEVELOPMENT ENVIRONMENTS	20
CO1019	DATABASES AND WEB APPLICATIONS	20
Optional Modules		
Either		
CO1094	COMPUTERS AND SOCIETY	20
Or		
FR1018	UNDERSTANDING CONTEMPORARY FRANCE 2	10
FR1010	FRENCH LANGUAGE ADVANCED (YEAR LONG – 10 CREDITS PER SEMESTER)	20
Or		
FR1021	FRENCH LANGUAGE (BEGINNERS) 2	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
CO1904	COMPUTER ARCHITECHTURE	20
Semester total		**60**

SEMESTER 2

Core Modules		**Credits**
CO1909	BUSINESS AND FINANCIAL COMPUTING	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

CO3016	COMPUTING PROJECT (PART 1)*	20

Optional Modules

40 credits of optional modules selected from

CO3105	C++	20
CO3091	COMPUTATIONAL INTELLIGENCE	20
CO3095	SOFTWARE MEASUREMENT AND QUALITY ASSURANCE	20
CO3098	WEB TECHNOLOGIES	20
Semester total		**60**

SEMESTER 2

Core Modules		**Credits**
CO3016	COMPUTING PROJECT (PART 2)*	20

Optional Modules

40 credits of optional modules selected from

CO3093	BIG DATA AND PREDICTIVE ANALYSIS	20
CO3002	ANALYSIS AND DESIGN OF ALGORITHMS	20
CO3090	DISTRIBUTED SYSTEMS AND APPLICATIONS	20
CO3096	COMPRESSION METHODS FOR MULTIMEDIA	20
CO3099	CRYPTOGRAPHY AND INTERNET SECURITY	20
Semester total		**60**

*TAKEN OVER TWO SEMESTERS, TOTAL CREDITS = 40

BSc COMPUTING WITH A YEAR ABROAD

Second Year Modules

As for the first- and second-year of the BSc degree in Computing.

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 Computing modules. Failure to do so will result in the student reverting to the three year BSc Computing 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 Year Modules

As for the third-year of the BSc degree in Computing.

BSc COMPUTING WITH A YEAR IN INDUSTRY

First and Second Year Modules

As for the first- and second-year of the BSc degree in Computing.

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 BSc. Computing degree.

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

Fourth Year Modules

As for the third-year of the BSc degree in Computing.