**Royal Holloway, University of London**
**Course specification for an undergraduate award**
**MSCI COMPUTER SCIENCE (SOFTWARE ENGINEERING) (G461)**

## Section 1 – Introduction to your course

This course specification is a formal document, which provides a summary of the main features of your course and the learning outcomes that you might reasonably be expected to achieve and demonstrate if you take full advantage of the learning opportunities that are provided. Further information is contained in the University prospectus, and in various handbooks, all of which you will be able to access online. Alternatively, further information on the University's academic regulations and policies can be found here. Further information on the University's Admissions Policy can be found here.

Your degree programme in **MSci Computer Science (Software Engineering)** provides a progressive structure in which you are able to gain ever-wider knowledge and understanding, and appropriate skills. The programme contains a combination of mandatory and optional modules to introduce students to the theory and practice of Computer Science, including software development techniques and the technologies underlying specific application areas such as gaming and robotics.

The structure encourages you to develop your own interests through informed choice among specialist options. In the final stage of the programme, you undertake a project, which accounts for 50% of your studies in the final stage. There is a free choice of other penultimate and final stage courses reflecting both core material, such as compiler theory, and currently important research areas such as machine learning, information security, software language engineering, intelligent agents, and computational finance. Your degree courses at Royal Holloway, University of London, will be delivered over four years, each of which normally involves modules to the value of 120 credits (which is equivalent to 60 ECTS credits[1]).

While Royal Holloway keeps all the information made available under review, courses and the availability of individual modules, especially optional modules are necessarily subject to change at any time, and you are therefore advised to seek confirmation of any factors which might affect your decision to follow a specific course. In turn, Royal Holloway will inform you as soon as is practicable of any significant changes which might affect your studies.

The following is a brief description for some of the most important terminology for understanding the content of this document:

*Degree course* – May also be referred to as 'degree programme' or simply 'programme', these terms refer to the qualification you will be awarded upon successful completion of your studies.
*Module* – May also be referred to as 'course', this refers to the individual units you will study each year to complete your degree course. Undergraduate degrees at Royal Holloway comprise a combination of modules in multiples of 15 credits to the value of 120 credits per year. On some degree courses a certain number of optional modules must be passed for a particular degree title.

[1] The European Credit Transfer and Accumulation System (ECTS) is a learner-centred system for credit accumulation and transfer. ECTS credits reflect the total workload required to achieve defined learning outcomes and their associated workload, including teaching hours and guided independent study. 15 UK credits is equivalent to 7.5 ECTS. 30 UK credits is equivalent to 15 ECTS. Further details on ECTS can be found within the ECTS User Guide 2015.

| Section 2 – Course details | | | |
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| **Date of specification update** | February 2026 | **Location of study** | Egham Campus |
| **Course award and title** | MSci Computer Science (Software Engineering) | **Level of study** | Undergraduate |
| **Course code** | 2845 | **UCAS code** | G461 |
| **Year of entry** | 2027/28 | **Language(s) of Tuition** | English |
| **Awarding body** | Royal Holloway, University of London | | |
| **Department** | Computing, Security and Mathematics | **Other departments involved in teaching the course** | N/A |
| **Mode(s) of attendance** | Full-time | **Duration of the course** | 4 years |
| **Accrediting Professional, Statutory or Regulatory Body requirement(s)** | British Computer Society (BCS), and European Quality Assurance Network for Informatics Education (EQANIE). | | |
| **Link to Coursefinder for further information:** | https://www.royalholloway.ac.uk/studying-here/ | **For queries on admissions:** | https://royalholloway.ac.uk/applicationquery |

| Section 3 – Degree course structure | | | | | |
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| **3.1 Mandatory module information**<br>**The following table summarises the mandatory modules which students must take in each year of study** | | | | | |
| **Year** | **Module code** | **Module title** | **Credits** | **FHEQ level** | **Module status (Mandatory Condonable MC or Mandatory Non-Condonable MNC)** |
| 1 | CS1811 | Object Oriented Programming I | 15 | 4 | MNC |
| 1 | CS1812 | Object Oriented Programming II | 15 | 4 | MNC |
| 1 | CS1822 | Programming Laboratory | 15 | 4 | MC |
| 1 | CS1840 | Internet Services | 15 | 4 | MC |
| 1 | CS1860 | Mathematical Structures | 15 | 4 | MC |
| 1 | CS1870 | Machine Fundamentals | 15 | 4 | MC |
| 1 | CS1880 | Mathematical Methods for Computer Science | 15 | 4 | MC |
| 1 | CS1890 | Software Design | 15 | 4 | MC |
| 2 | CS2800 | Software Engineering | 15 | 5 | MNC |
| 2 | CS2815 | Small enterprise team project | 15 | 5 | MNC |
| 2 | CS2850 | Operating Systems | 15 | 5 | MC |
| 2 | CS2855 | Databases | 15 | 5 | MC |
| 2 | CS2860 | Algorithms and Complexity | 15 | 5 | MC |
| 2 | IY2760 | Introduction to Information Security | 15 | 5 | MC |
| 2 | IY2840 | Computer and Network Security | 15 | 5 | MC |
| 3 | CS3821 | Full Unit Project | 30 | 6 | MNC |

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| 3 | PC3001 | User-centred Design | 15 | 6 | MC |
| 4 | CS4825 | MSci Team Project | 60 | 7 | MNC |

This table sets out the most important information for the mandatory modules on your degree course. These modules are central to achieving your learning outcomes, so they are compulsory, and all students on your degree course will be required to take them. You will be automatically registered for these modules each year. Mandatory modules fall into two categories: 'condonable' or 'non-condonable'.

In the case of mandatory 'non-condonable' (MNC) modules, you must pass the module before you can proceed to the next year of your course, or to successfully graduate with a particular degree title. In the case of mandatory 'condonable' (MC) modules, these must be taken but you can still progress or graduate even if you do not pass them. Please note that although Royal Holloway will keep changes to a minimum, changes to your degree course may be made where reasonable and necessary due to unexpected events. For example: where requirements of relevant Professional, Statutory or Regulatory Bodies have changed and course requirements must change accordingly, or where changes are deemed necessary on the basis of student feedback and/or the advice of external advisors, to enhance academic provision.

### 3.2 Optional modules

In addition to mandatory modules, there will be a number of optional modules available during the course of your degree. Although Royal Holloway will keep changes to a minimum, new options may be offered or existing ones may be withdrawn. For example, where reasonable and necessary due to unexpected events, where requirements of relevant Professional, Statutory or Regulatory Bodies (PSRBs) have changed and course requirements must change accordingly, or where changes are deemed necessary on the basis of student feedback and/or the advice of External Advisors, to enhance academic provision. There may be additional requirements around option selection; please contact the Department for further information.

In **Year 2**: you will take 1 further non-project optional module(s) starting with CS2 or IY2.

In **Year 3**: you will take 1 further non-project optional module(s) starting with IY3; and you will take 2 further non-project optional module(s) starting with CS3 or PC3 or IY3 from the SE strand; and you will take 2 further non-project optional module(s) starting with CS3 or PC3 or IY3.

In **Year 4**: you will take 4 further non-project optional module(s) starting with CS4 or IY4 or PC4.

**Note:** students for each year are expected to take part in the Advanced topics seminar course (CS3010). This course is not part of the degree programme but attendance will be placed in the student's transcripts.

## Section 4 - Progressing through each year of your degree course

For further information on the progression and award requirements for your degree, please refer to Royal Holloway's Academic Regulations.

Progression throughout the year/s is monitored through performance in summative or formative coursework assignments. Please note that if you hold a Student Visa and you choose to leave (or are required to leave because of non-progression) or complete early (before the course end date stated on your CAS), then this will be reported to UKVI.

All first year undergraduate students are required to take and pass the non-credit bearing Moodle-based Academic Integrity module SS1001 in order to progress into the second year of study (unless their course includes the alternative mandatory SS1000 module). The pass mark for the module assessment is stated in the on-line Academic Integrity Moodle module. Students may attempt the assessment as often as they wish with no penalties or capping. Students who meet the requirements for progression as stipulated in the University's Undergraduate Regulations (Section: Conditions for progression to the next stage) but fail to pass the Moodle-based Academic Integrity module will not be permitted to progress into their second year of academic study at the University.

As part of your degree programme you may also be required to complete a course to develop your academic writing skills. This course does not carry credit but passing it is a requirement to progress to the next year of study.

## Section 5 – Educational aims of the course

The aims of this course are:

1. to produce graduates with the ability to engage in the lifelong learning and with the skills required for a professional career in a computer-based environment or for a research career in Computer Science and related areas;
2. to develop a mastery of computing-related cognitive abilities and skills as described in the QAA Computer Science benchmark statement;
3. in a flexible and progressive structure, to develop students' knowledge and understanding of essential facts and theory, with the ability to use this knowledge to devise, specify, design, implement, test, document and critically evaluate computer-based systems;
4. to develop an advanced understanding of professional and ethical issues involved in the deployment of computer technology;
5. to produce graduates with a range of personal attributes relevant to the world beyond higher education, including information retrieval and use, numeracy, the ability to devise and present logical arguments to inform and support actions, and organisational skills;
6. to develop an advanced understanding of knowledge and current awareness of current problems and/or new insights in the area of computing science research.
7. to produce graduates who can work effectively within teams;
8. to produce graduates who understand how business value can be delivered to their customers through the software they develop;
9. to produce graduates who can understand and work within a small company.

| **Section 6 - Course learning outcomes**<br><br>**In general terms, the courses provide opportunities for students to develop and demonstrate the following learning outcomes. (*Categories – Knowledge and understanding (K), Skills and other attributes (S), and Transferable skills (*)*)** | | | | | |
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| **Theme** | **Course Learning Outcome** | **Level 4** | **Level 5** | **Level 6** | **Level 7** |
| 1. Fundamentals | Explain and creatively apply the fundamental mathematical knowledge underpinning computer science. | 1.4.1 Explain the basic mathematical building blocks of computer science, and apply this knowledge in small exercises and programs | 1.5.1 Compare key algorithms and data-structures and select the most appropriate depending on the situation. | 1.6.1 Explain and apply foundational knowledge of a broad range of advanced computer science topics. | 1.7.1 Creatively apply knowledge to design and compare solutions to cutting-edge problems in a large-scale individual project.<br><br>1.7.2 Innovate using foundational knowledge of a broad range of cutting-edge computer science topics. |
| 2. Systems | Discuss in detail how computer systems are constructed and how they communicate, and the ability to apply this knowledge in practice. | 2.4.1 Describe the fundamentals of system design and computer/internet communication. | 2.5.1 Explain the theory and design of operating systems, and be able to write systems software with knowledge of low-level concepts such as memory management. | | |
| 3. Design | Design, plan, and execute and critically analyse innovative software projects,,then present, document, and reflect on the results. | 3.4.1 Explain and apply software design techniques to analyse requirements and specify software systems.<br><br>3.4.2 Discuss and apply the core concepts of modern | 3.5.1 Utilise advanced software development tools and environments.<br><br>3.5.2 Describe and deploy best-practice software development practices. | | 3.7.1 Plan, evaluate the risks of, and lead a large innovative project, and communicate the results via presentations and a critical report. |

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| | | industrially relevant programming languages in small- to medium-sized programs.<br><br>3.4.3 Present and document the design and features of a system, and evaluate both the software and the process. | | | |
| 4. Information | Discuss, apply, and advise on methods, techniques and tools for information modelling, management and security. | 4.4.1 Recognise the basic principles of computer data representation and organisation. | 4.5.1 Explain and deploy the principles of database design and usage.<br><br>4.5.2 Describe the principles of information security. | | 4.7.1 Systematically apply software engineering tools for designing and creating appropriate software systems.<br><br>4.7.2 Advise on the organisational responsibilities of information management. |
| 5. Teamwork | Work independently and as a team, demonstrating time-management,organisational, and leadership skills. | 5.4.1 Complete and manage the delivery of multiple pieces of individual and team-based work. | 5.5.1 Put into practice industry-standard team working principles and methodologies. | | 5.7.1 Lead, plan and deliver a large-scale individual project. |
| 6. Independence | Develop new skills independently and apply them creatively. | 6.4.1 Deliver a medium-sized group project incorporating elements of self-learning. | 6.5.1 Deliver a large group project incorporating elements of self-learning. | | 6.7.1 Deliver a large individual cutting-edge project incorporating elements of self-learning and innovation. |

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| 7. Cutting Edge | Explain,apply knowledge of, and critically analyse cutting-edge topics in computer science. | | | 7.6.1 Explain and apply knowledge of topics of cutting-edge computer-science. | 7.7.1 Explain, apply knowledge of, and critically analyse key topics of advanced computer-science. |
| 8. Professionalism | Discuss and advise on the professional, commercial, moral, and ethical aspects of computer-based systems. | 8.4.1 Follow codes of conduct in informal team-based environments.<br><br>8.4.2 Recognise the wider societal context of software systems and the developer responsibilities. | 8.5.1 Follow codes of conduct in professional team-based environments.<br><br>8.5.2 Develop code to meet external and commercial, rather than self-driven, requirements. | | 8.7.1 Advise on the societal and professional impact of a large-scale software product. |
| 9. Software Engineering | Discuss, apply, and innovate with a broad range of principles of key topics in software engineering. | | 9.5.1 Work as part of a professional team to deliver a large-scale product for a realistic client.<br><br>9.5.2 Discuss and apply knowledge of computer and network security. | 9.6.1 Plan, evaluate the risks of, and execute a large supervised project, and communicate the results via presentations and a critical report.9.6.2 Explain and apply knowledge in several advanced areas of software engineering including user interface design. | 9.7.1 Evaluate and discuss cutting-edge topics in software engineering and be able to apply the principles creatively as part of an advanced team project. |

| Section 7 - Teaching, learning and assessment |
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| Teaching and learning on your course is closely informed by the active research of staff, particularly in the areas of Artificial Intelligence, Algorithms, Programming Languages, Machine Learning, Software Engineering, and Quantum. In general terms, the course provides an opportunity for you to develop and demonstrate the learning outcomes detailed herein.<br><br>Teaching and learning is mostly by means of lectures, small-group tutorials, practical and problem classes, supervised computing laboratory work, group work, completion of coursework and private study, guided independent study and research in the stage three individual project.<br><br>Assessment of knowledge and understanding is typically by formal, unseen written examination, coursework assignments, project reports, oral presentations, and the final stage project report. Transferable skills are also inherently assessed through the assignments, reports and oral presentations. Feedback is provided on students' performance in coursework, both assessed and non-assessed, and during tutorial and practical sessions. Full details of the assessments for individual modules can be obtained from the Department.<br><br>Contact hours come in various forms and may take the form of time spent with a member of staff in a lecture or seminar with other students. Contact hours may also be laboratory or, studio-based sessions, project supervision with a member of staff, or discussion through a virtual learning environment (VLE). These contact hours may be with a lecturer or teaching assistant, but they may also be with a technician, or specialist support staff.<br><br>The way in which each module on your degree course is assessed will also vary. Assessments designated as 'summative' will receive a mark which will count towards your overall mark for the module, and potentially your degree classification, depending on your year of study. On successful completion of the module you will gain the credits listed.<br><br>More detailed information on modules, including teaching and learning methods, and methods of assessment, can be found via the online Royal Holloway Curriculum Catalogue. The accuracy of the information contained in this document is reviewed regularly by the university, and may also be checked routinely by external agencies. |

| Section 8 – Additional costs |
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| There are no single associated costs greater than £50 per item on this degree course. |
| **These estimated costs relate to studying this particular degree course at Royal Holloway. General costs such as accommodation, food, books and other learning materials and printing etc., have not been included, but further information is available on our website.** |

| Section 9 – Indicators of quality and standards | |
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| **QAA Framework for Higher Education Qualifications (FHEQ) Level** | 4-7 |
| Your course is designed in accordance with the FHEQ to ensure your qualification is awarded on the basis of nationally established standards of achievement, for both outcomes and attainment. The qualification descriptors within the FHEQ set out the generic outcomes and attributes expected for the award of individual qualifications. The qualification descriptors contained in the FHEQ exemplify the outcomes and attributes expected of learning that results in the award of higher education qualifications. These outcomes represent the integration of various learning experiences resulting from designated and coherent courses of study. | |
| **QAA Subject benchmark statement(s)** | http://www.qaa.ac.uk/quality-code/subject-benchmark-statements |
| Subject benchmark statements provide a means for the academic community to describe the nature and characteristics of courses in a specific subject or subject area. They also represent general expectations about standards for the award of qualifications at a given level in terms of the attributes and capabilities that those possessing qualifications should have demonstrated. | |

| Section 10– Intermediate exit awards (where available) | | |
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| You may be eligible for an intermediate exit award if you complete part of the course as detailed in this document. Any additional criteria (e.g. mandatory modules, credit requirements) for intermediate awards is outlined in the sections below. | | |
| **Award** | **Criteria** | **Awarding body** |
| BSc Computing Science | To be awarded a degree with BCS and EQANIE accreditation you must meet the specific award requirements set out in this course specification. If you do not meet these requirements but otherwise meet the requirements for BSc Computing Science, you will be eligible for BSc Computing Science as an exit award. | Royal Holloway and Bedford New College |
| Diploma in Higher Education (DipHE) | Pass in 210 credits of which at least 90 must be at or above FHEQ Level 4 and at least 120 of which must be at or above FHEQ Level 5 | Royal Holloway and Bedford New College |

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| Certificate in Higher Education (CertHE) | Pass in 120 credits of which at least 90 must be at or above FHEQ Level 4 | Royal Holloway and Bedford New College |