

**PROGRAMME SPECIFICATION**

**Course record information**

|   |  |
|---|--|
| Name and level of final award                   | <b>BEng (Honours) Software Engineering</b><br><b>BEng (Honours) Software Engineering with Industrial Experience</b><br>The BEng (Honours) Software Engineering is a BEng (Hons) degree that is Bologna FQ-EHEA first cycle degree or diploma compatible. |
| Name and level of intermediate awards           | Diploma of Higher Education in Software Engineering<br>Diploma of Higher Education in Software Engineering with Industrial Experience<br>Certificate of Higher Education in Software Engineering   |
| Awarding body/institution                       | University of Westminster  |
| Teaching Institution                            | University of Westminster  |
| Status of awarding body/institution             | Recognised Body  |
| Location of delivery                            | Central London (Cavendish)   |
| Language of delivery and assessment             | English  |
| Mode, length of study and normal starting month | Full time, three years, September start OR<br>Full time, four years with Industrial Experience, September start  |
| <u>QAA subject benchmarking group(s)</u>        | QAA subject benchmark for Computing<br>British Computer Society guidelines on accreditation  |
| Professional statutory or regulatory body       | British Computer Society (BCS)<br>Re-accreditation is pending  |
| Date of course validation/review                | 2019   |
| Date of programme specification approval        | September 2019   |
| Valid for cohorts                               | 2020-2021  |
| Course Leader                                   | Dr Alexander Bolotov   |

|   |  |
|---|--|
| UCAS code and URL                                 | <a href="http://westminster.ac.uk/courses/undergraduate">westminster.ac.uk/courses/undergraduate</a> |
| Westminster course code<br>Westminster route code | BECSS01F   |
| HECOS code  | 100374   |

## Admissions requirements

There are standard minimum [entry requirements](#) for all undergraduate courses. Students are advised to check the standard requirements for the most up-to-date information.

For most courses a decision will be made on the basis of your application form alone. However, for some courses the selection process may include an interview to demonstrate your strengths in addition to any formal entry requirements.

More information can be found here: [westminster.ac.uk/courses/undergraduate/how-to-apply](http://westminster.ac.uk/courses/undergraduate/how-to-apply)

## Recognition of Prior Learning

Applicants with prior certificated or experiential learning at the same level of the qualification for which they wish to apply are advised to visit the following page for further information: [westminster.ac.uk/recognition-of-prior-certified-learning](http://westminster.ac.uk/recognition-of-prior-certified-learning).

## Aims of the course

A software engineer is responsible for creating and maintaining secure and robust software applications. This involves applying a wide range of technologies and skills to formally design, develop and test software to ensure that it satisfies the client's or stake holders' requirements. Students completing the course will have sufficient expertise to enter the highly dynamic and rapidly developing software industry productively, with a minimum of training. They will be able to operate effectively in a professional environment; they will learn quickly and will be ready to use new technologies. Moreover, they will be creative and based on the software engineering practice, will be able to produce ideas and solutions to make existing technologies more efficient, or to develop new technologies. These are only a few, but fundamental, features of the exciting modern software industry which, to a large extent, drives our society and which you, as a graduate from BEng Software Engineering, will enter.

The BEng Software Engineering has been designed to:

- provide students with knowledge and understanding of the fundamental principles and technologies of software engineering and general computer science;
- give students practical skills in the application of existing tools and techniques for the design and development of software;
- give students substantial experience of applying a systematic approach to software development and evaluation individually, or as members of a software team;

- make students aware of professional, ethical and legal issues that might arise in a software development environment;
- enable students to develop as independent and self-critical problem solvers;
- prepare students for continued study at an advanced level, either in formal postgraduate study or as continued professional development.

### What will you be expected to achieve?

Learning outcomes are statements on what successful students have achieved as the result of learning. These are threshold statements of achievement the learning outcomes broadly fall into four categories:

- The overall **knowledge and understanding** you will gain from your course (KU).
- **Graduate attributes** are characteristics that you will have developed during the duration of your course (GA).
- **Professional and personal practice learning outcomes** are specific skills that you will be expected to have gained on successful completion of the course (PPP).
- **Key transferable skills** that you will be expected to have gained on successful completion of the course (KTS).

**Level 4 learning outcomes:** Upon completion of level 4 you will be able to:

L4.1 - Use appropriately the client-server architecture with respect to client design and security implications. (KU)

L4.2 - Apply core mathematical elements to solve algorithmic problems. (KU)

L4.3 - Describe the structure of a computing system, the design of its basic components and explain the interactions of hardware and software components. (KU)

L4.4 - Analyse small scale problems and design their solutions by applying algorithmic and mathematical techniques. (PPP)

L4.5 - Methodically capture user requirements and create a specification that meets them. (PPP)

L4.6- Describe, create and manipulate simple data collections through their underlying representation. (PPP)

L4.7 - Apply programming principles and constructs to implement solutions to small scale problems. (PPP)

L4.8 - Recognise and explain behaviour constraints of a professional code of conduct towards third parties in a Computer Science working environment. (KTS)

L4.9 - Following guidance, review literature in Computer Science and present in written and oral form own work and learning, critically comparing, contrasting and evaluating the findings. (KTS)

**Level 5 learning outcomes:** Upon completion of level 5 you will be able to:

L5.1 Demonstrate competency in object-oriented design and algorithmic and mathematical approaches to solve medium scale problems (PPP)

L5.2 Analyse algorithms and their complexity and apply relevant strategies in designing and re-using algorithms (KU)

L5.3 Utilise, compare and contrast software frameworks and architectures and implement solutions using object-oriented programming (PPP)

L5.4 Demonstrate how information is modelled, persistently stored, manipulated and retrieved, as data, to serve scalable solutions to medium-scale object-oriented problems (KU)

L5.5 Employ a standard modelling language for the design, representation and formal specification of software (PPP)

L5.6 Explain the basic principles of modern operating systems and how they serve operational needs (KU)

L5.7 Identify and explain security risks and their implications for computer systems (KU)

L5.8 Identify, evaluate, and improve on interface issues between human users and computer systems using multiple platforms (KTS)

L5.9 Demonstrate professional responsibility in the development of quality software engineering solutions in a global context and the presentation and defence of these in multiple communication forms, supported by methodical research (PPP)

**Level 6 learning outcomes:** Upon completion of level 6 you will be able to:

L6.1 Methodically and independently develop requirements to a solution for a large scale software problem using appropriate languages and tools (PPP)

L6.2 Design large scale data systems to discover hidden relationships and automate and/or inform decision making (PPP)

L6.3 Identify and appraise the main threats to computer systems and networks security and integrity (KU)

L6.4 Demonstrate complete handling of the full life-cycle of a software engineering project underpinned by an entrepreneurial approach and a focus on the needs of real clients and the wider society (KTS)

L6.5 Apply appropriate methodologies in carrying out independent research in software engineering and produce a report demonstrating evidence of critical thinking (KU)

**How will you learn?**

In your course you will have a wide selection of learning and using them will help you mature in attitude and competence, preparing you for your future career and life in general. Learning in your course is a partnership: expert University staff will guide you through the necessary core knowledge of your subject and help you develop an understanding, while you, increasingly, take the leading role in pursuing the learning that meets your specific needs.

Your course is organised into a number of **modules** at each level. These are the building blocks of your course. Each module consists of a number of learning activities over a number of weeks designed to help you achieve the knowledge and skills related to a particular area within your subject.

The principal aim of your course is to equip you for professional life, or further study, relevant to your current programme of study. To prepare you for this, the learning in your course will not take place only in the scheduled class. Your learning will use several methods, each supporting the others:

- **Lectures** will give you access to expertise and present you with the knowledge you need in your subject.
- **Practical tutorial or laboratory sessions** will allow you to understand, apply and strengthen your skills under the guidance of a tutor.
- **Independent study time** will let you take more control of your own learning and give you the framework that will help you to keep on learning without supervision.
- **Personal development** will allow you to complement your knowledge with the specific specialised skills that meet your individual needs.
- **Real-life project briefs or case studies**, normally provided by an organisation, will give you the opportunity to engage with employers and use your knowledge and skills to solve a real-life or a business-related problem.
- **Work placement**, if you choose the option to do a year-long placement as part of your degree, will give you the opportunity to practice and enhance your learning from course.

In your first year of study (called **Level 4**) you will make the full transition into Higher Education. You will develop the key core skills for Software Engineering complemented with the foundations of your specific course or pathway. To help this transition your course has additional classes and support sessions at this level that you will need to fully engage with so you can prepare for the advanced study that follows.

Your second year of study (**Level 5**) will help you develop some autonomy. At this level you will develop detailed knowledge in Software Engineering and will be able to deal with more areas by yourself and in teams, reflecting on your own strengths and identifying areas to specialise in. Following that level you may choose to have a year in industry (a **placement year**) to strengthen your understanding of industry needs through direct application of your evolving skills.

Your third year of study (**Level 6**) you will have learned to work autonomously with your lecturers increasingly being there to support you and challenge your thinking; this is the level that completes your preparation for going into industry and further study, with an ability to handle the complexity of large-scale systems and environments and with full control of your further development needs.

Throughout all levels of your course you will also develop necessary, distinct, attributes that will help you compete effectively in a global changing environment.

The Graduate Attributes (GA) are developed throughout the course through the knowledge and professional skills modules, and are intended to ensure that you have a deep knowledge of the subject area, you are critical and creative thinkers, are professional, socially, ethically and environmentally aware, global in outlook and community engaged, and a literate and effective communicator. The table below maps the key attributes to the core course modules for levels 4 to 6.

## Level 4

| Graduate Attributes  | Learning outcomes   |
|--|---|
| Critical and creative thinkers   | L4.4 Analyse small scale problems and design their solutions by applying algorithmic and mathematical techniques.   |
|  | L4.2 Apply core mathematical elements to solve algorithmic problems   |
|  | Apply programming principles and constructs to implement solutions to small scale problems.   |
|  | L4.5 Methodically capture user requirements and create a specification that meets them.   |
| Global in outlook and community engaged; Socially, environmentally and ethically aware | L4.6 Describe, create and manipulate simple data collections through their underlying representation.   |
|  | L4.3 Describe the structure of a computing system, the design of its basic components and explain the interactions of hardware and software components.                                       |
| Socially, environmentally and ethically aware  | L4.1 Use appropriately the client-server architecture with respect to client design and security implications.  |
|  | L4.7 Recognise and explain behaviour constraints of a professional code of conduct towards third parties in a Software Engineering working environment.                                       |
| Literate and Effective Communicator  | L4.8 Following guidance, review literature in Software Engineering and present in written and oral form own work and learning, critically comparing, contrasting and evaluating the findings. |

## Level 4 modules

| Software Development I, II | Computer Systems Fundamentals | Web Design & Development | Trends in Computer Science | Mathematics for Computing |
|----------------------------|-------------------------------|--------------------------|----------------------------|---------------------------|
| ✓                          |                               |                          |                            | ✓                         |
|                            |                               |                          |                            | ✓                         |
| ✓                          |                               |                          |                            |                           |
|                            |                               |                          | ✓                          |                           |
| ✓                          |                               |                          | ✓                          |                           |
|                            | ✓                             |                          |                            |                           |
|                            |                               | ✓                        |                            |                           |
|                            |                               |                          | ✓                          |                           |
|                            |                               |                          | ✓                          |                           |

## Level 5

| Graduate Attributes  | Learning outcomes  |
|--|--|
| Critical and creative thinkers   | L5.1 Demonstrate competency in object-oriented design and algorithmic and mathematical approaches to solve medium scale problems.  |
|  | L5.2 Analyse algorithms and their complexity and apply relevant strategies in designing and re-using algorithms.   |
|  | L5.3 Utilise, compare and contrast software frameworks and architectures and implement solutions using object-oriented programming.  |
|  | L5.4 Demonstrate how information is modelled, persistently stored, manipulated and retrieved, as data, to serve scalable solutions to medium-scale object-oriented problems.   |
|  | L5.5 Employ a standard design language for the design, representation and formal specification of software.  |
| Global in outlook and community engaged, Socially, environmentally and ethically aware | L5.6 Explain the basic principles of modern operating systems and how they serve operational needs.  |
|  | L5.8 Identify, evaluate, and improve on interface issues between human users and computer systems using multiple platforms.  |
| Socially, environmentally and ethically aware<br>Literate and Effective Communicator   | L5.7 Identify and explain security risks and their implications for computer systems.  |
|  | L5.9 Demonstrate professional responsibility in the development of quality software engineering solutions in a global context and the presentation and defence of these in multiple communication forms, supported by methodical research. |

|                 | Object Oriented Programming | Machine Learning and Data Mining | Software Development Group Project | Algorithms: Theory, Design and Implementation | Database Systems |
|-----------------|-----------------------------|----------------------------------|------------------------------------|---|------------------|
| Level 5 modules | ✓                           | ✓                                | ✓                                  | ✓   |                  |
|                 | ✓                           | ✓                                | ✓                                  | ✓   |                  |
|                 | ✓                           |                                  |                                    | ✓   |                  |
|                 |                             |                                  | ✓                                  | ✓   | ✓                |
|                 |                             |                                  | ✓                                  | ✓   |                  |
|                 |                             |                                  |                                    |   |                  |
|                 |                             |                                  | ✓                                  |   |                  |
|                 |                             |                                  |                                    |   | ✓                |
|                 |                             |                                  | ✓                                  | ✓   |                  |
|                 |                             |                                  |                                    |   |                  |



## Level 6

| Graduate Attributes  | Learning outcomes  |
|--|--|
| Critical and creative thinkers   | L6.1 Methodically and independently develop requirements to a solution for a large scale software problem using appropriate languages and tools.   |
|  | L6.2 Design large scale data systems to discover hidden relationships and automate and/or inform decision making.  |
| Global in outlook and community engaged, Socially, environmentally and ethically aware | L6.3 Identify and appraise the main threats to computer systems and networks security and integrity.   |
| Socially, environmentally and ethically aware, entrepreneurial                         | L6.4 Demonstrate complete handling of the full life-cycle of a software engineering project underpinned by an entrepreneurial approach and a focus on the needs of real clients and the wider society. |
| Literate and Effective Communicator  | L6.5 Apply appropriate research methodologies in carrying out independent research in software engineering and produce a report demonstrating evidence of critical thinking.                           |

### Level 6 modules

|   | Cyber Security | Formal Methods | Final Year Project | Concurrent Programming |
|---|----------------|----------------|--------------------|------------------------|
|   |                | ✓              | ✓                  | ✓                      |
|   |                |                | ✓                  | ✓                      |
| ✓ |                |                |                    |                        |
|   | ✓              |                | ✓                  |                        |
|   |                |                | ✓                  |                        |

## The learning and the teaching of the course

### How will you be assessed?

In your course, assessment and feedback are the key elements in measuring learning. The assessment strategy of the course supports to foster the highly skilled and professional software engineer of the future.

You will undertake a **wide variety of assessment** tasks as their progress through your degree course on both practical and theoretical elements via a mix of formative and summative with project based synoptic assessment. Their nature will vary according to your level and the nature of the task. The benefit is that this provides a range of activities to support and encourage the blended learning and allows you to demonstrate your skills and understanding in a variety of ways.

The formative assessment helps you see where you are in your learning and what you have learned so far, while summative assessment measures how much you have learned in a way that contributes to your overall grades. The formative assessment plays an important role to provide feedback to you as this serves to indicate your progress and helps identify strengths and weaknesses. The major feedback is given throughout modules in tutorials, and group discussions, and in the final demonstrations and vivas in practical modules. A wider range of feedback can be further achieved through student participations of national and international programming and software development competitions and your involvement of community events. This allows you to identify areas for improvement while demonstrating your skills and knowledge to software industry and society.

Other forms of assessment will include *practical exercises* ranging from small tasks that might be completed in a tutorial, to something more complex like designing and writing a larger computer program. For example, *part-written practical reports* and *Lab-controlled assessments/ work-based lab engagement* will be used to test your ability to analyse and interpret data, and/or build and reflect on real-world cases during computer lab sessions.

There will be some formal *examinations* (usually at the end of each term). Some of the work will be completed individually through *closed-book exams* or *in-class tests*, and sometimes you will work with other students as part of a team, emulating as close as possible the environment you will face in your later life in industry. *Group coursework* and *team projects*, which are essential for software engineering related careers, will help you to develop practical skills alongside the more specific skills that are being assessed. For example, you will be working as part of a team on a typical industry case study and will be assessed on your ability to appreciate the importance of business logistic operations and their interaction. Each group member will be in charge of specific task(s) (role), and all together will have to collaborate and exchange relevant information to satisfy the organisation objectives. Such a group work will be a simulation of a real-life working environment with shared goals but individual accountability and codes of conduct. Clear Assessment Criteria are stated in module documents, and these are linked to the module Learning Outcomes. you will receive written feedback from all assessments, and this directly relates to the assessment criteria for each module

Other methods of assessments to evaluate various graduate skills will include *portfolios& interviews* where you will be designing and presenting an artefact.

All assessments that contribute to the final grades will be assessed against set criteria, following rigorous quality mechanisms that ensure our academic judgement remains fair and consistent with the wider educational sector. Typically, assessment will become longer, and

more self-managed, as you get into the second year and the final year of the course and you will have more freedom to focus on specialist areas to innovate through your own decisions informed by your own research. **Assessment is designed to be a learning experience in itself** and will help students make that transition from small practical exercises to more complex piece of work towards the substantial, year-long, project of the final year.

To help you see how different areas connect with each other you will have in some cases tasks that assess the outcomes from different modules in one complex piece of work. These are called **synoptic assessments**. These assignments allow combining elements of learning from different modules and show the accumulated knowledge and understanding of software development approach and technology, especially supporting the linkage of principle and practice. It also helps to reduce formal assessment and so ensure that you have as much time and opportunity as possible to develop practical skills alongside the more specific skills that are being assessed. Contemporary Software Engineering requires design and implementation by a team or even multiple teams working together each responsible for specific phases of software development. It also requires skills of software documentation. Therefore, you will write essays and research reports, and learn how to write in a style suitable to a piece of academic work, and to make proper use of references and bibliographies. Project and ideas are driven from course partners which may be alumni and/or collaborators of the School of Computer Science and Engineering research groups.

Overall guidance through the personal tutoring system will help you continuously reflect on where you are of your learning, so you can make informed decisions on the pace and focus of your own independent learning.

Throughout your learning you will get feedback. **Feedback** will help you reflect on what you have learned so you can identify the areas in which you are strong and the areas in which you need to learn more. Feedback will be given to you in response to assessment, in response to questions in lectures, seminars and tutorials, and in guidance you get during supervision. But feedback will also come from your interactions with other students and with industry. This is possible if you choose to undertake an industrial placement year and/or through participation in national and international competitions. All feedback will be useful to help you guide your learning so that you develop the rights skills faster.

### **Employment and further study opportunities**

The course offers a short-term work-based learning experience by providing you with an opportunity to work on a real-life problem which is normally set by an external organisation as a small-scale project.

This project forms a part of the assessment in a designated module called 5COSC003W Software Development Group Project. This module provides the structure for your learning and receiving support from the module team. You will work on the project on your own and/or as part of a small team within and outside the class. During this time, you may also get a chance to interact with the organisation that has set the project. The quality of the work that you produce for the project get assessed as part of the module's assessment.

This experience will allow you to put theory into practice by applying your knowledge and skills gained from various modules to address a real-life situation, usually within the context of a business-related problem. Furthermore, this experience will help you develop subject-specific technical skills as well as certain employability skills such as leadership, organisation and commercial awareness.

In addition, this course gives you with the opportunity to take a year in industry (work placement) after completing the second year of your study and gain work experience, increasing your chances of employability after graduation. You will be offered help and support

to find and secure placement opportunities through various workshops and events organised by the Career Development Centre and the course team. Typically, you will be assigned into roles involving tasks related to software engineering.

As a graduate of University of Westminster, you shall be expected to demonstrate the following five Graduate Attributes:

- Critical and creative thinkers
- Literate and effective communicator
- Entrepreneurial
- Global in outlook and engaged in communities
- Social, ethically and environmentally aware

University of Westminster courses capitalise on the benefits that London as a global city and as a major creative, intellectual and technology hub has to offer for the learning environment and experience of our students.

The *BEng Software Engineering* course aims to create high quality graduates who have a strong focus on solving real-world problems, will have adaptability and maturity, and have a strong foundation of knowledge and the technical capability to be able to immediately contribute to their workplace environment. Graduates of the course will have been taught and utilised industrial tools and techniques and will be versed in all aspects of software engineering. As well as having a solid background in software development, graduates from the course shall also have multiple specialism in various areas of software engineering related fields during their early years as a computing professional. Graduates shall be independent thinkers, lifelong learners and be able to analyse, critically reflect, and be able to confidently and effectively communicate. Graduating from this accredited course where professional skills and practice are embedded, graduates shall be able to meet the required professional and ethical standards expected in software development industry. Graduates shall also be capable and prepared for the broadening their knowledge by undertaking Masters level study or higher.

Attributes are developed throughout all levels of the course to help graduates compete effectively in a global changing environment.

In brief, our graduates will be distinctive in being:

1. Critical and creative thinkers: investigating a problem case study to identify research questions and formulate hypotheses, using appropriately techniques to support problem solving, designing and implementation.
2. Literate and effective communicator: communicating analysis ideas and results in written and verbal forms and presentation tools.
3. Entrepreneurial: Having fundamental knowledge of the organization operations and issues, tackling problems resiliently and confidently both independently and in groups, reflecting and learning from own performance.
4. Global in outlook and engaged in communities: Understand current software engineering market trends and implications, growth of technology used within the software industry, engaging in networking events, participating in competitions.
5. Socially, ethically and environmentally aware: adhering to ethical code, making responsible use of data driven technologies, avoiding biased data collection and presentation.
6. Prepare students for continued study at an advanced level, either in formal postgraduate study or as continued professional development.

Upon completion of the course you will be expected to gain an industrial software engineering role. Due to the complexity of the contemporary software, much of software engineering work relies on the teamwork of multidisciplinary groups. To reflect this, a range of design, implementation and management modules is embedded across the course.

Graduating from this accredited course where professional skills and practice are embedded, the BEng Software Engineering graduates shall be able to meet the required professional and ethical standards expected in the sophisticated modern workplace. Graduates shall also be capable and prepared for the broadening their knowledge by undertaking further study towards Masters and PhD levels.

Graduates would typically be part of a software development team designing, implementing and or maintaining sophisticated applications, very likely to be distributed. The actual role within the team may be to grow to the role of a senior or lead software engineer, software designer, advanced programmer, systems administrator or systems analyst. Other types of roles possible are in a wider computer science research in a commercial company or academic institution. Being equipped with the knowledge and skills relevant to emerging areas such as AI, our graduates will be highly competitive in the contemporary job market.

## Course structure

This section shows the core and option modules available as part of the course and their credit value. Full-time Undergraduate students study 120 credits per year. Course structures can be subject to change each academic year following feedback from a variety of sources.

The list below shows the core and option modules that are available as part of the course and their credit value. A *core* module is one that must be attempted to gain the award of BEng Software Engineering. In addition to the core modules, at levels 5 and 6 a student can take one free choice module, which is either an option or an elective.

Therefore, a student can choose either 1 subject specific option or one elective option at levels 5 and 6.

The School organises module information sessions where advice is given to students regarding their module choices and cognate areas. Student can also seek advice from their personal tutor and other academics concerning their choice.

| Credit Level 4 – Core                                     |                                    |        |           |      |
|---|------------------------------------|--------|-----------|------|
| Module code   | Module title                       | Status | UK credit | ECTS |
| 4COSC003W   | Trends in Computer Science         | Core   | 20        | 10   |
| 4COSC004W   | Computer Systems Fundamentals      | Core   | 20        | 10   |
| 4COSC001W   | Software Development I             | Core   | 20        | 10   |
| 4COSC011W   | Web Design and Development         | Core   | 20        | 10   |
| 4COSC002W   | Mathematics for Computing          | Core   | 20        | 10   |
| 4COSC005W   | Software Development II            | Core   | 20        | 10   |
| <b>Award of Certificate of Higher Education available</b> |                                    |        |           |      |
| Credit Level 5 - Core                                     |                                    |        |           |      |
| Module code   | Module title                       | Status | UK credit | ECTS |
| 5COSC001W   | Object Oriented Programming        | Core   | 20        | 10   |
| 5COSC002W   | Database Systems                   | Core   | 20        | 10   |
| 5COSC003W   | Software Development Group Project | Core   | 20        | 10   |

|  |   |               |                  |             |
|--|---|---------------|------------------|-------------|
| 5DATA002W  | Machine Learning and Machine Learning                             | Core          | 20               | 10          |
| 5SENG001W  | Algorithms: Theory, Design and Implementation                     | Core          | 20               | 10          |
| One of the following modules   |   |               |                  |             |
| 5NTCM003W  | Network Software Engineering                                      | Option        | 20               | 10          |
| 5COSC005W  | Mobile Application Development                                    | Option        | 20               | 10          |
| 5COSC006W  | Server-side Web Development                                       | Option        | 20               | 10          |
| 5ELEN006W  | Operating Systems Programming                                     | Option        | 20               | 10          |
| 5ELEN009W  | Robotic Principles  | Option        | 20               | 10          |
| 5BUIS002W  | Business Analytics  | Option        | 20               | 10          |
| <b>Award of Diploma of Higher Education available</b>  |   |               |                  |             |
| *6COSC013W   | Computer Science Placement  | Core          |                  |             |
| <b>Credit Level 6 – Core</b>   |   |               |                  |             |
| <b>Module code</b>   | <b>Module title</b>   | <b>Status</b> | <b>UK credit</b> | <b>ECTS</b> |
| 6COSC006W  | Final Year Project  | Core          | 40               | 20          |
| 6SENG001W  | Formal Methods  | Core          | 20               | 10          |
| 6COSC002W  | Cyber-Security  | Core          | 20               | 10          |
| 6SENG002W  | Concurrent Programming  | Core          | 20               | 10          |
| One of the following modules   |   |               |                  |             |
| 6COSC005W  | Advanced Server-side Web Programming                              | Option        | 20               | 10          |
| 6ELEN010W  | Applied Robotics  | Option        | 20               | 10          |
| 6DATA002W  | Advanced Analytics  | Option        | 20               | 10          |
| 6COSC004W  | Mobile Native Application Development                             | Option        | 20               | 10          |
| New  | Internet of Things  | Option        | 20               | 10          |
| 6NTCM001W  | Applied Distributed Systems Programming                           | Option        | 20               | 10          |
| 6COSC003W  | Applied Intelligence - Smart Algorithms for Modern and Ethical AI | Option        | 20               | 10          |
| <b>Award of BEng available</b>   |   |               |                  |             |
| <b>Award of BEng Honours available</b>   |   |               |                  |             |
| <b>*When 6COSC013W is taken award of BEng /BEng Honours with Industrial Experience available</b> |   |               |                  |             |

One Westminster Elective module may also be chosen as an alternative to an option at level 5 and level 6.

Not all option modules will necessarily be offered in any one academic year. In addition, timetabling and limited spaces may mean you cannot do your first choice of modules.

## Professional Body Accreditation or other external references

The course is intended to fulfil the educational requirements of the British Computer Society (BCS) to fulfil the educational requirements registration as a Chartered IT Professional (CITP) and partial Chartered Engineer (CEng). Re-accreditation from Professional Body is pending.

## Reference points for the course

### Internally

University Teaching and Learning policy statements,  
University Quality Assurance Handbook and Modular Frameworks, staff research.

### Externally

QAA Subject Benchmark statements,  
Professional, Statutory, Regulatory Body requirements/guidance,

University and SEEC (credit consortium) level descriptors.

### **Professional body accreditation**

British Computer Society (BCS) Criteria.

### **Academic regulations**

The current Handbook of Academic Regulations is available at:

[westminster.ac.uk/academicregulations](http://westminster.ac.uk/academicregulations)

However, this course may have specific regulations to comply with professional body accreditation which should be read in conjunction with [Section 17 Framework for Undergraduate Courses](#) of the Handbook of Academic Regulations. Any course specific regulations will be outlined in the course handbook provided to students on enrolment.

Regulations are subject to change and approval by Academic Council.

### **How will you be supported in your studies?**

#### **Course Management**

The BEng (Honours) Software Engineering course is under the School of Computer Science and Engineering and the management structure supporting the course is as follows:

- Dr Alexander Bolotov, Course Leader is responsible for day to day running and overall management of the course and development of the curriculum.
- Dr Philip Trwoga, Head of School, holds academic responsibility for the course and other courses within the School Professor.
- Jonathan Stockdale, Pro Vice-Chancellor and Head of the College of Design, Creative and Digital Industries, holds overall responsibility for the course, and for the other courses run by the College.

#### **Academic Support**

Upon arrival, an induction programme will introduce you to the staff responsible for the course, the campus on which you will be studying, the Library and IT facilities, additional support available and to your Campus Registry. You will be provided with the Course Handbook, which provides detailed information about the course.

Each course has a course leader or Director of Studies. All students enrolled on a full-time course and part time students registered for more than 60 credits a year have a personal tutor, who provides advice and guidance on academic matters. The University uses a Virtual Learning Environment called Blackboard where students access their course materials, and can communicate and collaborate with staff and other students. Further information on Blackboard can be found at [westminster.ac.uk/blackboard](http://westminster.ac.uk/blackboard).

You will be allocated a personal tutor at the beginning of your studies who will support you throughout your student journey easing the transition into Higher Education through to higher levels of study.

Academic and Personal tutoring involves fostering academic partnerships, with mutual expectations, between tutors and students. Tutors will provide proactive, personalised

academic and pastoral support to help your academic, personal and professional development. We see students as co-creators in this academic partnership taking responsibility for their own development by fully engaging with tutoring arrangements to optimize their learning experience.

As such, you will have scheduled mandatory, individual meetings with your tutor who will provide you with regular feedback on your academic progress. Tutors can also advise you on the educational coherence of your module choice, assessment procedures, regulations and University structures, and educational support needs advising on appropriate provision available.

You will also have continuous pastoral support throughout your time at University and can see your tutor either by appointment or in designated office hours. Your tutor can provide a link to specialist support available through University Services and refer you for more specialised pastoral guidance as appropriate to the School Senior Tutor, Disability Services, Counselling Services, Registry and/or other Services for Students. It is important that you seek and ask for advice earlier rather than later.

More information is available from the Student Hub on Personal Tutoring which can be found at: <https://www.westminster.ac.uk/current-students/support-and-services/personal-tutors>

## **Learning Support**

The Academic Learning Development Centre supports students in developing the skills required for higher education. As well as online resources in Blackboard, students have the opportunity to attend Study Skills workshops and one to one appointment. Further information on the Academic Learning Development Centre can be found at [westminster.ac.uk/academic-learning-development](https://www.westminster.ac.uk/academic-learning-development).

Learning support includes four libraries, each holding a collection of resources related to the subjects taught at that site. Students<sup>1</sup> can search the entire library collection online through the Library Search service to find and reserve printed books, and access electronic resources (databases, e-journals, e-books). Students can choose to study in the libraries, which have areas for silent and group study, desktop computers, laptops for loan, photocopying and printing services. They can also choose from several computer rooms at each campus where desktop computers are available with the general and specialist software that supports the courses taught at their College. Students can also securely connect their own laptops and mobile devices to the University wireless network.

## **Support Services**

The University of Westminster Student and Academic Services department provide advice and guidance on accommodation, financial and legal matters, personal counselling, health and disability issues, careers, specialist advice for international students and the chaplaincy providing multi-faith guidance. Further information on the advice available to students can be found at [westminster.ac.uk/student-advice](https://www.westminster.ac.uk/student-advice). The University of Westminster Students' Union also provides a range of facilities to support students during their time at the University. Further information on UWSU can be found at [westminster.ac.uk/students-union](https://www.westminster.ac.uk/students-union).

## **Careers Support**

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<sup>1</sup> Students enrolled at Collaborative partners may have differing access due to licence agreements.



From the very start of your studies, the Careers and Employability Services department is committed to supporting your career progression by offering a wide range of developmental opportunities, combined with up to date, tailored careers information, advice and guidance.

Our experienced careers staff are able to work with you to reflect on your career goals and plan how to get the most from your time at the University of Westminster, to access a range of work based learning opportunities including work experience, part-time jobs, volunteering and mentoring, before supporting your transition into employment with personalised job hunting, CV, application and interview advice.

The University uses an online management system called Engage, which offers access to a variety of events and activities led by employers and careers and employability staff, extensive part-time, work experience and graduate vacancy lists, comprehensive careers information and advice and one to one career appointment. These services are also available to you for up to 3 years after you graduate.

### **How do we ensure the quality of our courses and continuous improvement?**

The course was initially approved by a University Validation Panel in **2019**. The panel included internal peers from the University, academic(s) from another university and a representative from industry. This helps to ensure the comparability of the course to those offered in other universities and the relevance to employers.

The course is also monitored each year by the College to ensure it is running effectively and that issues which might affect the student experience have been appropriately addressed. Staff will consider evidence about the course, including evidence of student achievement, reports from external examiners in order to evaluate the effectiveness of the course.

A Course revalidation takes place periodically to ensure that the curriculum is up-to-date and that the skills gained on the course continue to be relevant to employers. Students meet with Revalidation panels to provide feedback on their experiences. Student feedback from previous years is also part of the evidence used to assess how the course has been running.

### **How do we act on student feedback?**

Student feedback is gathered in a variety of ways.

- Through student engagement activities at Course/Module level, students have the opportunity to express their voice in the running of their course. Student representatives are elected to expressly represent the views of their peers. The University and the Students' Union work together to provide a full induction to the role of the student representatives.
- There are also School Staff Student Exchange meetings that enable wider discussions across the School. Student representatives are also represented on key College and University committees.
- All students are invited to complete a questionnaire before the end of each module. The feedback from this will inform the module leader on the effectiveness of the module and highlight areas that could be enhanced.
- Final year Undergraduate students will be asked to complete the National Student Survey which helps to inform the national university league tables.

**Please note:** This programme specification provides a concise summary of the main features of the course and the learning outcomes that a student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided. This specification should be read in conjunction with the Course Handbook provided to students and Module Handbooks, which provide more detailed information on the specific learning outcomes, content, teaching, learning and assessment methods for each module.

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