****



Programme Specification

**Title of Course:**

**BSc (Hons) Computer Science (Networking and Network Security) Top-up Year**

**Date Specification Produced: March 2019**

**Date Specification Last Revised: April 2023**

This Programme Specification is designed for prospective students, current students, academic staff and employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if they take full advantage of the learning opportunities that are provided. More detailed information on the teaching, learning and assessment methods, learning outcomes and content of each module can be found in the Course Guide, on Canvas and in individual Module Descriptors.

# SECTION 1: GENERAL INFORMATION

|  |  |
| --- | --- |
| **Title:** | BSc (Hons) Computer Science (Networking and Network Security) |
| **Awarding Institution:** | Kingston University |
| **Teaching Institution:** | ESOFT Metro Campus |
| **Location:** | Sri Lanka |
| **Programme Accredited by:** | Non-accredited programme |

# SECTION 2: THE PROGRAMME

## Programme Introduction

This course is designed for Pearson Edexcel HND students, BCS HEQ students, and University of Colombo School of Computing’s Bachelor of Information Technology students, giving them academic recognition for the learning they had completed equivalent to Level 5 of a UK honours degree, to continue their studies and achieve a UK honours degree. Students on the top up programme will take level 6 modules of the equivalent full BSc (Hons) Computer Science (Networking and Network Security) Programme, enabling them to enhance their skills to be commensurate with a BSc (Hons) degree-level award. This Computer Science programme offered at ESOFT Metro is informed by the Kingston University’s portfolio of undergraduate degrees offered by the School of Computer Science and Mathematics (CSM) and focuses strongly on producing industry-ready graduates. This programme is offered as a level 6 honours top-up and available on a full-time basis over a period of one academic year. Kingston University’s Computer Science degree has a proud history; it was first accredited by the British Computer Society (BCS) in 1969. This programme’s curriculum is backed by the research undertaken within CSM and, in addition, it is informed by the School’s Industrial Advisory Panel. The degree in Computer Science (Networking and Network Security) introduces the tools, techniques and methodologies that represent the best practice in industry associated with Networking and Network Security.

**Learning through making**

The programme is driven by the philosophy of ‘learning through making’. This approach is expected to reflect the professional readiness of each student and will maximise their employability.

The Level 6 core modules are designed to cover the underlying principles for the subject discipline and are structured to ensure that all students study the core materials necessary to meet the benchmarking standards.

Students have the choice to select an option module to complement and enhance their already established domain knowledge, to improve further their employability prospects.

**Enhancing employability**

Careers advice is offered via ESOFT’s Career Guidance Unit. The Campus’ career service. Modules in the top-up year of the course would also allow students to explore new technologies and techniques.

**Investing in facilities**

We provide the latest equipment to support learning in our computing laboratories. They support a wide variety of the latest software and tools – such as Eclipse, NetBeans, Oracle, Java, tools for developing mobile apps, UML and CASE tools. Many of the subjects within the course are linked with practical work in our well-equipped and modern laboratories.

We hope to periodically review, revise and update our module content and themes to reflect the latest advances in the industry. We combine various teaching techniques, to enable our students to have a rich learning experience while gradually developing a portfolio of products which they can proudly showcase to potential employers.

## Aims of the Field/Course

The over-arching aim of the Computer Science (Networking and Network Security) course is to produce highly trained graduates with specialist technical knowledge and a scientific mind set, capable of solving real world problems, are driven by passion, sustainability and wider socio-technical implications are considered at all levels. Specifically the aims are to produce graduates who:

* have the required knowledge, skills and attitudes to practice as computing professionals in both industry and commerce
* are equipped to meet the academic, professional and practical requirements for membership of appropriate professional bodies.
* are aware of the actual and potential range of information and computer-based systems and of the ways in which these interact with their material, human, organizational and social environments
* possess the appropriate ability and inclination, and are equipped to undertake advanced studies and/or research and development in the computing and information systems disciplines
* can apply their knowledge and skills in the various contexts in which information and computer-based systems are developed. In particular, they can both initiate and sustain a planned and disciplined personal effort when working alone and can participate effectively as a member of a team
* have an inquisitive and reflective attitude when modelling systems and understand the functional and qualitative properties of systems.
* have the ability to evaluate and predict security, performance and efficiency associated system properties and their context dependencies.
* understand and can articulate the legal, ethical, social, cultural and public aspects of problems and solutions.
* have the capacity to acquire new knowledge and skills independently, to reflect on trends in the computing domain and to demonstrate through their actions a creative contribution.

## Intended Learning Outcomes

The programme outcomes are referenced to the QAA subject benchmarks for Computing and the [Framework for Higher Education Qualifications of UK Degree-Awarding Bodies (2014)](http://www.qaa.ac.uk/quality-code/the-existing-uk-quality-code/part-a-setting-and-maintaining-academic-standards), and relate to the typical student. The course provides opportunities for students to develop and demonstrate knowledge and understanding specific to the subject, key skills and graduate attributes in the following areas:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Programme Learning Outcomes** | | | | | |
|  | **Knowledge and Understanding**  On completion of the course students will be able to: |  | **Intellectual Skills**  On completion of the course students will be able to |  | **Subject Practical Skills**  On completion of the course students will be able to |
| A1 | explain and apply essential concepts, theories, principles and practices of computer science | B1 | analyse, abstract and decompose problems to design effective solutions | C1 | develop and critically evaluate specifications for specialist computer systems and communicate these specifications to other computing professionals |
| A2 | explain the social, ethical, legal, commercial and other human factors that affect the design, development, deployment of computer systems | B2 | synthesise information from disparate and potentially incomplete sources to model and build systems, documents and other related artefacts | C2 | use (and, where appropriate, modify) established systems, software development methods, techniques and tools to model and build computer based solutions |
| A3 | explain security issues and evaluate risk for the safe operation of computing and information systems | B3 | analyse and evaluate the extent to which a system meets the criteria for its current use and future development | C3 | collaborate and communicate effectively with other professionals/stakeholders to plan, design, manage, implement and deliver IT projects |
| A4 | explain the different ways in which data and information may be represented, stored and transmitted | B4 | elicit, evaluate and model business, customer and user requirements, incorporating considerations such as sociological and commercial contexts, user experience, aesthetics and technical practicalities | C4 | implement software solutions using a variety of programming languages, environments and platforms |
| A5 | identify the different project management approaches commonly used in the IT industry and select, modify or construct one for a given context | B5 | use different programming approaches, patterns and/or paradigms, and justify the selection of one or more for a given context | C5 | specify, design and prototype human/computer interfaces using HCI and UX theory and best practices |

In addition to the programme learning outcomes identified overleaf, the programme of study defined in this programme specification will allow students to develop a range of Key Skills as follows:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Key Skills** | | | | | | |
| **Self-Awareness Skills** | **Communication Skills** | **Interpersonal Skills** | **Research and information Literacy Skills** | **Numeracy Skills** | **Management & Leadership Skills** | **Creativity and Problem Solving Skills** |
| Take responsibility for own learning and plan for and record own personal development | Express ideas clearly and unambiguously in writing and the spoken work | Work well with others in a group or team | Search for and select relevant sources of information | Collect data from primary and secondary sources and use appropriate methods to manipulate and analyse this data | Determine the scope of a task (or project) | Apply scientific and other knowledge to analyse and evaluate information and data and to find solutions to problems |
| Recognise own academic strengths and weaknesses, reflect on performance and progress and respond to feedback | Present, challenge and defend ideas and results effectively orally and in writing | Work flexibly and respond to change | Critically evaluate information and use it appropriately | Present and record data in appropriate formats | Identify resources needed to undertake the task (or project) and to schedule and manage the resources | Work with complex ideas and justify judgements made through effective use of evidence |
| Organise self effectively, agreeing and setting realistic targets, accessing support where appropriate and managing time to achieve targets | Actively listen and respond appropriately to ideas of others | Discuss and debate with others and make concession to reach agreement | Apply the ethical and legal requirements in both the access and use of information | Interpret and evaluate data to inform and justify arguments | Evidence ability to successfully complete and evaluate a task (or project), revising the plan where necessary |  |
| Work effectively with limited supervision in unfamiliar contexts |  | Give, accept and respond to constructive feedback | Accurately cite and reference information sources | Be aware of issues of selection, accuracy and uncertainty in the collection and analysis of data | Motivate and direct others to enable an effective contribution from all participants |  |
|  |  | Show sensitivity and respect for diverse values and beliefs | Use software and IT technology as appropriate |  |  |  |

## Entry Requirements

The minimum entry qualifications for the programme are:

1. Edexcel HND Levels: A pass in the relevant HND to include a pass in the sixteen units listed in Table 1 below (or their equivalent) and the achievement of an overall score of 240 credit points of which 120 would be at Level 5.
2. Completion of the 2nd year of the University Of Colombo, School Of Computing’s Bachelor of Information Technology External Degree, covering the subjects shown in Table 2.

Or

1. Completion of the British Computer Society’s (BCS) Higher Education Qualification’s (HEQ) Certificate and Diploma levels, shown in Table 3.

Or

1. Case by case consideration of equivalent academic and professional qualifications achieved at comparable levels

Table 1: Pearson BTEC HND in Computing (Network Engineering)

|  |  |  |
| --- | --- | --- |
| **Subject Details** | **QCF Level** | **Credit Value** |
| Programming | 4 | 15 |
| Networking | 4 | 15 |
| Professional practice | 4 | 15 |
| Database design and development | 4 | 15 |
| Security | 4 | 15 |
| Managing a successful computing project | 4 | 15 |
| Maths for computing | 4 | 15 |
| Web design and development | 4 | 15 |
| Computing research project | 5 | 15 |
| Business intelligence | 5 | 15 |
| Cloud computing | 5 | 15 |
| Emerging technologies | 5 | 15 |
| Computing research project | 5 | 15 |
| Discrete maths | 5 | 15 |
| Transport network design | 5 | 15 |
| Network security | 5 | 15 |

Table 2: UCSC BIT Degree Year 1 and Year 2

|  |  |  |
| --- | --- | --- |
| **Subject Details** | QCF Level | Credit Value |
| Information Systems & Technology | 4 | Equivalent to the first 2 years of a UK Hons Degree. |
| Computer Systems I | 4 |
| Web Application Development I | 4 |
| Communication Skills | 4 |
| Introductory Mathematics | 4 |
| Personal Computing | 4 |
| Mathematics for Computing I | 4 |
| Programming I | 4 |
| Database Systems I | 4 |
| Systems Analysis & Design | 4 |
| Object Oriented Analysis & Design | 5 |
| Fundamentals of Software Engineering | 5 |
| Mathematics for Computing II | 5 |
| User Interface Design | 5 |
| Web Application Development II | 5 |
| Programming II | 5 |
| Information Technology Project Management | 5 |
| Rapid Software Development | 5 |
| Computer Networks | 5 |

Table 3: BCS HEQ Certificate & Diploma Level

|  |  |  |
| --- | --- | --- |
| **Subject Details** | QCF Level | Credit Value |
| Information Systems | 4 | Equivalent to the first 2 years of a UK Hons Degree.  Level 4  100/6181/2  Level 5 100/6190/3 |
| Software Development | 4 |
| Computer & Network Technology | 4 |
| Professionals issues in IS practice | 5 |
| Option to be selected | 5 |
| Option to be selected | 5 |
| Option to be selected | 5 |

A minimum overall IELTS score of 6.0 with a minimum of 5.5 each element, iBT TOEFL 80 with R at 20, L at 19, S at 21 and W at 20, or equivalent, is required for those for whom English is not their first language. A minimum of a Credit pass at the Sri Lankan G.C.E O/L English Language exam will also be considered as equivalent to this level.

We will consider a range of alternative qualifications or experience that is equivalent to the typical offer. Applications from international students with equivalent qualifications are welcome.

All applications will be subject to the Kingston University Accreditation of Prior

Learning (APL) rules and regulations applicable at the time of application.

## Course Structure

This programme is offered in full-time mode and leads to the award of a BSc (Hons) degree. Entry is normally at level 6 with HND (See section D). Transfer from a similar programme is possible, but is at the discretion of the admissions tutor. Intakes are normally in January and September.

### E1. Professional and Statutory Regulatory Bodies

### Programme is not currently accredited.

### E2. Work-based learning, including sandwich courses

### Not applicableE3. Outline Programme Structure

*BSc (Hons) Computer Science (Networking and Network Security) – top-up year*

**LEVEL 6**

CI6015 Cryptography and Network Security

CI6250 Internet Protocols and Services

Level 6 Option

CI6600 Individual Project

***Level 6 Modules***

Student must take three core modules (including the Individual Project module) and select one option module.

Core Modules

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Level 6 | | | | | |
| Module name | Module code | Credit  Value | Level | Teaching block | Pre-requisites |
| Individual Project | CI6600 | 30 | 6 | 1 and 2 | None |
| Cryptography and Network Security | CI6015 | 30 | 6 | 1 and 2 | None |
| Internet Protocols and Services | CI6250 | 30 | 6 | 1 and 2 | None |

Option Modules

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Level 6 | | | | | |
| Module name | Module code | Credit  Value | Level | Teaching block | Pre-requisites |
| Software Development Practice | CI6125 | 30 | 6 | 1 and 2 | None |
| Advanced Data Modelling | CI6320 | 30 | 6 | 1 and 2 | None |
| Digital Entrepreneurship | CI6415 | 30 | 6 | 1 and 2 | None |

Level 6 requires the completion of the compulsory module CI6100 Individual project, two core modules and one option module. The complete list of option modules available will be determined annually and is subject to resourcing.

## Principles of Teaching, Learning and Assessment

The learning and teaching strategies reflect the programme aims and learning outcomes, typical student background, potential employer requirements, and the need to develop a broad range of technical and professional skills with the ability to apply them appropriately. The strategies ensure that students have a sound understanding of computing and have acquired the transferable skills expected of modern-day graduates.

The programme is designed according to the Kingston University Curriculum Design Principles and it utilises a wide range of teaching and learning methods to enable all students to be actively engaged throughout the course. The learning, teaching and assessment strategies reflect the programme aims and learning outcomes, student background, potential employer requirements, and the need to develop a broad range of technical skills with the ability to apply them appropriately.

The academic year includes scheduled contact time for lectures, workshops, enhancement activities, and revision. The standard module provision includes laboratory sessions, seminars, group work – to underpin the principles taught in the lectures – but, also dedicated programming aid sessions for students needing further help.

The capstone project is a mandatory part of the programme. It offers students the opportunity to integrate their cumulative academic studies and practical skills within a single project, which may be for a real client.

I

Learning computer science is often most readily undertaken in the context of the search for solutions to real-life problems. This is reflected in the approach that will be gradually introduced to this programme, alongside conventional classroom teaching, and is epitomised in the problem-centred learning practice. Students will be frequently working in groups, focusing on real-world problem solving. This will contribute to creating a rich learning environment in which students and their teachers collaborate as a team. It significantly enhances students’ readiness for employment in industries where different skills and backgrounds complement each other to deliver a better product.

ESOFT’s Learning Management System (ELMS), the Campus’ virtual learning environment (VLE), is used extensively in all modules as a communication tool and means of dissemination of learning and reference materials, formative worksheets, assignments, links, videos and lecturer-annotated slides. In this way it acts as a dynamic study guide in each module and provides a structured learning space to support students for independent study, facilitate discussion, and in addition, in some modules, for formative and summative tests and surveys. ELMS (VLE) is also used to facilitate group work, both formatively and summatively.

Study materials, including examples and exercises, are published on ELMS in advance of the time-tabled sessions, to allow students to prepare and benefit fully from classroom time. The availability of this material assists students from various backgrounds to achieve a common level at the start of the session or to highlight any deficiencies which they can then address with the lecturer.

Students are encouraged to develop as independent learners as they progress through their course. This is supported explicitly through the individual project module.

### Assessment and Feedback

The assessment is regarded as an integral part of our learning and teaching strategy, and incorporates both assessments of and for learning. Ample opportunities are given to students for formative assessment with rapid feedback.

A wide range of assessment mechanisms is used to ensure that students with diverse backgrounds and different strengths and abilities are not disadvantaged and to ensure that our students are capable of tackling many different types of problems. The methods of assessment have been selected so as to be most appropriate for the nature of the subject material, teaching style and learning outcomes in each module and the balance between the various assessment methods for each module reflects the specified learning outcomes. Emphasis is given to authentic assessments based on real-world problems. This allows the students to produce “artefacts” as outcomes of the assessment process, forming a portfolio which provides tangible evidence of their developing skills and knowledge thus enhancing their employment prospects.

### Inclusive Teaching Practice

Opportunities to ensure that the curriculum is inclusive take place at forums as the Student Voice Committees and Boards of Study together with discussions at module and course level. Meetings take place between subject teams to consider subject specific issues. The variety of teaching activities also takes account of the students’ different learning preferences and experiences and there is a careful balance of individual and group based activities.

Marking criteria are provided for all assessments as part of the assessment booklet at the beginning of the year for each module and care is taken to ensure that the language used in the assessment is jargon free, which is checked by the moderator. The case studies used are designed to be inclusive.

Feedback, in a variety of formats provides students with guidance in developing skills which are both beneficial for future assessments and highly valued by employers.

The 30 credit capstone Individual Project, consolidates independent learning skills and typically provides an opportunity for practical application of their academic knowledge to the implementation of a solution or construction of a suitable artefact.

In the programme as a whole, the following components might be used in the assessment of the various modules:

* Practical exercises: to assess students’ understanding and technical competence
* Individual and group-based case studies: to assess ability to understand requirements, to provide solutions to realistic problems and to interact and work effectively with others as a contributing member of a team. The outcomes can be:
  + Written report, where the ability to communicate the relevant concepts, methods, results and conclusions effectively will be assessed.
  + Oral presentation, where the ability to summarise accurately and communicate clearly the key points from the work in a brief presentation will be assessed.
  + Poster presentation where information and results must be succinct and eye-catching.
  + Video, which may replicate features of oral presentations but allows advance preparation away from the audience (which may suit some students better).
  + Articles, emphasising the ability to communicate with different audiences.
  + Interviews, emphasising the ability to answer questions appropriately and relevantly.
  + Simulated client interactions: letters, quotations, etc.
* Multiple choice or short answer questions: to assess competence in basic techniques and understanding of concepts.
* Long answer structured questions in coursework assignments: to assess the ability to apply learned techniques to solve simple to medium problems and which may include a limited investigative component
* Long answer structured questions in end-of-module examinations: to assess overall breadth of knowledge and technical competence to provide concise and accurate solutions within restricted time
* Project: The individual project module represents an opportunity for students to draw together different aspects of their learning on the course and to apply the techniques learned in an extended study. As such the assessment here will place a greater emphasis on the ability to plan work, manage time effectively, and research background information, culminating in a written report and interview.

At the beginning of each academic year there is a joint department-wide meeting at which the delivery of material and assessments is planned with a full calendar being constructed. This ensures:

* that care is taken to avoid summative assessment bunching and thus manage student workloads;
* synchronised and coherent delivery of material across the programme in a way that is visible both to staff and students, thus enabling assessments to draw on skills and knowledge from an appropriate variety of modules.

Students are expected to develop their skills, knowledge, confidence and understanding through independent and group learning, in the form of guided and self-directed study, and the exploration of the application of computing in the real world, throughout their course. These are reinforced with professional development opportunities tailored for the top-up level and delivered by the ESOFT Career Guidance Unit. Furthermore, all students explore group case studies in computing and information systems, requiring the collaborative investigation/solution of some real world problems as well as the production of written reports and oral or poster presentations. These foster the development of team-working, research and (formal) communication skills. All students will carry out research and development and present the background to and findings of their projects as indicated above. This will enhance their research and investigative skills to explore and master complex new ideas, learn and apply advanced techniques and further develop their independent working and communication skills.

### Research Informed Teaching

The course team is research active within the ESOFT Research Centre (ERC), which is dedicated to the advancement of the theory and applicability of computer science to enable internationally-leading work in the field of informatics, addressing the needs of society in the thematic areas of health, communications, security and data. The centre provides an inclusive and outward looking environment for research development, fostering interdisciplinary and multidisciplinary research to achieve maximum impact in real-world applications.

The ERC is still in its early stages. An international research journal has already been published, and academic staff is actively encouraged to take part in all areas of research. The ERC is a specific requirement of the University Grants Commission (UGC) in terms of approving the application that has been submitted by ESOFT Metro Campus to be recognised as a non-state degree awarding institution.

There is good linkage between research and teaching and the teaching team for computer science draws from ERC members.

Students are also able to develop their research skills which form a fundamental part of the Level 6 curriculum. These are particularly emphasised through the supporting lectures linked to the CI6600 individual project module, and problem-based assessment tasks found in other modules. These skills enable students to distinguish and present appropriate evidentiary information in an argument. These skills are greatly valued by employers.

Staff members also engage with research into teaching and learning in Higher Education which feeds through to support learning in lectures and other forms of student engagement during contact time.

## Support for Students and their Learning

Students are supported by a highly qualified team of academic staff that includes individuals in the following roles:

* A Course Director to help students understand the programme structure
* A Module Leader for each module
* A Personal Tutor to provide academic and personal support

Additional support is provided by the following specialist staff:

* A Placement Tutor to give general advice on placements
* Technical Support to advise students on IT and the use of software
* A designated Programme Administrator
* English language support

Matters outside the academic arena are supported by:

* Student support facilities that provide advice on issues such as finance, regulations, legal matters, accommodation, international student support etc.
* Disability and dyslexia student support
* ESOFT Career Guidance Unit ESOFT Student Council (ESC)
* An induction week at the beginning of each new academic session
* Student Voice Committee
* A virtual learning environment (VLE) available on the Campus’ intranet

The students are introduced to all these mechanisms during induction sessions at the beginning of the top-up year. It is here that students first encounter the Campus’ computer network, which includes their personal access to the ELMS and how to use it as a learning environment.

Students are expected to be involved in the development of their programme. On an individual level through meetings with their personal tutors at which they can discuss their academic progress, personal development and can seek advice on course and module choices in the light of their career aspirations. As a cohort, students can contribute to many aspects of programme evolution for example by student representation on committees, including Student Voice Committees, as well as by their formal and informal feedback such as end-of-module reviews.

### Support for Academic Skills

There is a Student Support Team to help students with any problem affecting their studies. This can range from illness, problems writing an assignment, or questions about academic regulations through to serious confidential issues.

### The Personal Tutoring Scheme (PTS)

A Faculty-wide student support system exists, which includes, for example, an ESOFT counselling centre where students can seek advice without an appointment. They can also email, or phone a designated number to get instant help. Students are assigned a member of the computing academic staff as their Personal Tutor (PT) at the start of their studies in the programme. The first contact between student and PT is during Induction Week for an introductory meeting and thereafter the following procedure is followed:

In the top-up year the principle focus is on graduation and employability and the PT scheme uses the capstone project module to promote PT-style discussions alongside regular project meetings

In the first weeks of term the PT’s role is to welcome students, encourage them to reflect on their progress, and plan to make the most of their final year, exemplified by early deliverables in the project module. Throughout Level 6, the ESOFT Career Guidance Unit team provides activities which the PT signposts for students, some of which are delivered within, and linked explicitly to, sessions and assignments in core modules.

At the beginning of the second teaching block, the PT meets with their tutees to discuss the opportunities for graduate study and employment and provide contact details for employers’ reference requests. The final project is a key employability “artefact”. Students can seek advice from their personal tutor or project supervisor who may be a different academic.

Both the Project Supervisor and Personal Tutor are able, in collaboration with the ESOFT Career Guidance Unit, to encourage students how best to present their project on their *CV* and at interview.

## Ensuring and Enhancing the Quality of the Course

The ESOFT Metro Campus has several methods for evaluating and improving the quality and standards of its provision. These methods are actively monitored by Kingston University. These include:

* External examiners
* Student Voice Committee (SVC) meetings
* Annual Monitoring and Enhancement
* Periodic review undertaken at subject level
* Student evaluation including MEQs
* Moderation policies
* Feedback from employers

## Employability Statement

Computing qualifications are amongst the most versatile and enable graduates to find employment in a wide spectrum of careers ranging from systems and business analysts, and software engineers, through to programmers and network specialists in a wide range of public and private sector industries.

The ESOFT curriculum, like that of Kingston University, is largely applied in nature, with many case studies chosen for their topicality and relevance to industry, such as information systems design, programming, networking, and implementation issues. Working on case studies designed to simulate the working environment, typically in teams, gives students experience of applying their computing, information systems and networking methods and key skills to open-ended problems with complex solutions, and presenting their findings, including any limitations, in a professional manner. This mirrors the experience of computing professionals working in commerce and industry. To further set the material in context as well as inspire our students, leading practitioners from industry are invited to give guest lectures and workshops. Throughout the course students develop communication and interpersonal skills, learn time management and the value of prioritising and planning by involvement in the learning activities outlined in section F above.

In preparation for their future employment, we make extensive use of industry standard software such as Oracle J Developer, Oracle SQL Developer, Eclipse, Adobe, MS Visual Studio, NetBeans, etc. throughout the course. The use of the guided option routes enable students to specialise in their chosen domains.

### Personal Development Portfolio (PDP)

PDP is centred on student learning and development to encourage the student to become a more effective, independent and confident self-directed learner who appeals to employers. The student is responsible for engaging with the PDP process, which is introduced during the induction period to support them and enable them to reflect upon their learning and achievements, formulate study action plans, and to plan their career development needs. Students create a personal record of learning containing evidence of their qualities, key skills, achievements and products (artefacts of their learning and assessments) to support industrial placement applications and future job applications or applications for graduate studies. The development plans are reviewed regularly for feedback from their personal tutor.

**Student Employability**

Our programme is designed to embed employability skills within the curriculum and develop students’ ability to recognise their personal and academic achievements and career aspiration. This is fostered through the strand of professional environments modules built into the programme from the start. During these, students experience a transition from guided towards independent learning and career planning and development, through a series of sessions, offered under the auspices of the ESOFT Career Guidance Unit (ECGU), including: Professional Communication, Time and Self-Management and Identifying and Articulating Skills. There are also opportunities to perfect skills required to gain employment such as: CV writing, Psychometric Testing, and Using LinkedIn. These modules are shared with other courses in the School and students study and work in a multidisciplinary environment, developing their ability to communicate with non-subject specialists. In this way students gain insight into the true nature of commercial teamwork, harnessing a range of different talents and skills to tackle complex problems, preparing them for the workplace. As they progress students enhance their planning, teamwork and communication skills, and show evidence of these though oral and poster presentations and both individual and group written reports. Outputs from these (written reports, posters and records, e.g. as videos and/or slideshows), plus products such as computer programs or results from modelling exercises on real-world problems, can be collated into a portfolio which may be presented to potential employers. Furthermore, their personal development and career options and plans are discussed with their personal tutors at regular intervals throughout their studies, and guidance given as appropriate. This is in liaison with the ESOFT Career guidance team, the Campus’ Careers Service.

This theme culminates in the Level 6 capstone project module, which draws together the academic strands of the course. It also enhances students’ employability skills in different ways, giving them an insight into what professionals do in graduate careers. Typically, the project involves the creation of an artefact relevant to the course, often with some new element or feature. Undertaking this type of activity gives students a taste of independent research, albeit supported by the supervisor, as they familiarise themselves with the real world situation and the techniques required to investigate it. In the project, students are encouraged to develop their critical thinking, creative and analytical skills, and gain experience and proficiency in technical writing. When choosing their Level 6 option choices and project topic, students are guided by their Personal Tutor regarding what possible choices best suit their career aspirations.

The experiences gained during student projects and their reports and presentations on them can provide a valuable case study to be cited in job applications and, if shortlisted, a focus for discussion and demonstration of professional skills in interviews. This has proved to be vitally important for several recent graduates, for whom giving an account of their project and the skills developed therein was crucial in securing a position of graduate employment during their interviews.

The ESOFT course is vocational and curriculum developments are discussed with Kingston University School of CSM’s Industrial Advisory Panel. Both CSM and ESOFT have strong links with industry and with the professional body, the BCS Chartered Institute for IT. It hosts a local BCS chapter and several members of the CSM School are involved with the Institute at corporate level.

The Destinations and Leavers survey by the Kingston University indicates that graduates from this programme go onto the following careers:

|  |  |  |  |
| --- | --- | --- | --- |
|  | | | |
| Technical Analyst | Technical manager / Information Systems Manager | System support manager / Information Manager | Software developer / Software Engineer |
| Software administrator | IT Consultant / Systems Architect | IT developer | Database administrator / IT systems administrator |
| Network support / Network Engineer executive | Analyst / Application Analyst / Business Analyst | Internet developer | Project manager |
| Web master | Analyst programmer | Web designer / Web Developer | Network analyst |
| Data Analyst / Information Analyst | Multimedia Programmer | UX Analyst | Communication Manager / Network Consultant |

## Approved Variants from the Undergraduate Regulations

Reassessment of the project module

Reassessment following failure in the CI6600 *Individual Project* module will normally be:

* + by retake to improve the dissertation for marginal failure (Grade F5 or marks of 35-39) and the mark will be capped
  + otherwise by repeat with a new project brief.

Compensation of modules:

Compensation is permitted in at most 30 credits across the programme, excluding the CI6600 *Individual Project* module. A module, other than CI6600, with a grade of F5 (marks of 35-39) can be compensated for a PC grade by at least 90 credits passed at that level.

## Other sources of information that you may wish to consult

QAA Benchmark statement website: <https://www.qaa.ac.uk/quality-code/subject-benchmark-statements>

Professional or statutory body information: <http://www.bcs.org/>

Module guides

Student handbook

Guidance on Enterprise and Entrepreneurship (Draft)

<https://www.qaa.ac.uk/en/quality-code/advice-and-guidance/external-expertise>

Shadbolt review

<https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/518575/ind-16-5-shadbolt-review-computer-science-graduate-employability.pdf>

Hinchliffe, G. & Jolly A. (2009), “Employer Concepts of Graduate Employability”, The Higher

Education Academy, Subject Centre for Education (ESCalate), York

## Development of Programme Learning Outcomes in Modules

This map identifies where the course learning outcomes are **summatively** assessed across the modules for this course. It provides an aid to academic staff in understanding how individual modules contribute to the programme aims, and a means to help students monitor their own learning, personal and professional development as the programme progresses and a checklist for quality assurance purposes.

|  | **Module Code** |  | CI6600 Individual Project | CI6125 Software Development Practice | CI6415 Digital Entrepreneurship | CI6250 Internet Services & Protocols | CI6320 Advanced Data Modelling | CI6015 Cryptography and Network Security |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Programme Learning Outcomes** | **Knowledge & Understanding** | A1 | ü | ü | ü | ü | ü | ü |
| A2 | ü | ü | ü |  |  |  |
| A3 | ü | ü |  | ü |  | ü |
| A4 | ü |  |  | ü | ü | ü |
| A5 | ü |  |  |  |  |  |
| **Intellectual Skills** | B1 | ü | ü | ü | ü | ü | ü |
| B2 | ü | ü | ü | ü | ü |  |
| B3 | ü | ü | ü |  |  |  |
| B4 | ü | ü | ü |  | ü |  |
| B5 | ü | ü |  |  |  |  |
| **Practical Skills** | C1 | ü | ü |  | ü | ü |  |
| C2 | ü | ü | ü | ü | ü | ü |
| C3 | ü | ü | ü |  | ü |  |
|  | C4 | ü | ü |  |  | ü |  |
|  |  | C5 | ü |  |  |  |  |  |

*(Students will be provided with formative assessment opportunities throughout the course to practise and develop their proficiency in the range of assessment methods utilised.)*

Shaded cells denote core modules

**Assessment Calendar**

This table indicates the weeks that summative assessments will be published and when they will be due to be submitted or sat (exams)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Module Title** | **Assessment Element** | **Brief published** | **Submission Week** | **Feedback Week** |
| **Level 6** | | | | |
| **Individual Project** | Proposal and progress blog, 20%, 3000 words | TW1 | TW7 | TW10 |
|  | Artefact and report, 60%, 4000 words | TW1 | TW24 | Marking wk |
|  | Viva and interim demos, 20% | TW1 | TW24/TW25 | Marking wk |
| **Software Development Practice** | Group artefact(s), 30%, 3000 words | TW1 | TW22 | TW25 |
|  | Individual artefact(s), 30%, 3000 words | TW1 | TW7-TW20 | TW10-TW25 |
|  | Written Exam, 2 hours | TW1 | Exams wk |  |
| **Cryptography and Network Security** | Experimental Report, 25%,3000 words | TW1 | TW12 | TW15 |
|  | Coursework, 25%, 3000 words | TW1 | TW2-TW20 | TW4-TW23 |
|  | Final Examination, 50%, 2 hours | NA | Exams wk |  |
| **Internet Protocols and Services** | Design Exercise 1, 25%, 3000 words | TW1 | TW18 | TW21 |
|  | Design Exercise 2, 25%, 3000 words | TW1 | TW20 | TW23 |
|  | Final Examination, 50%, 2 hours | NA | Exams wk |  |
| **Advanced Data Modelling** | Course work 1, 25%, 3000 words | TW1 | TW18 | TW21 |
|  | Course work 2, 25%, 4000 words | TW1 | TW22 | TW25 |
|  | Final Examination, 50%, 3 hours | NA | Exams wk |  |
| **Digital Entrepreneurship** | Coursework 1: Analysis, design and demonstration of digital system, 50%, 3000 words | TW1 | TW7 | TW10 |
|  | Coursework 2: Business Plan, 50%, 4000 words | TW1 | TW20 | TW23 |
|  |  |  |  |  |

## Technical Annex

|  |  |
| --- | --- |
| **Final Award(s):** | BSc (Hons) Computer Science (Networking and Network Security) |
| **Intermediate Award(s):** | Not applicable |
| **Minimum period of registration:** | Full-time – 1 year |
| **Maximum period of registration:** | Full-time – 2 years |
| **FHEQ Level for the Final Award:** | 6 |
| **QAA Subject Benchmark:**  **Degree Apprenticeship standard:** | Computing  N/A |
| **Modes of Delivery:** | Full-time |
| **Language of Delivery:** | English |
| **Faculty:** | Engineering, Computing and the Environment |
| **School:** | School of Computer Science and Mathematics |
| **Department:** | Computer Science |
| **UCAS Code:** | N/A |
| **Course/Route Code:** | N/A |
|  |  |