PROGRAMME SPECIFICATION

Course record information

Name and level of final award	**MSc *in Cyber Security and Forensics*** The *MSc in Cyber Security and Forensics* an MSc degree that is Bologna FQ-EHEA second cycle degree or diploma compatible.
Name and level of intermediate awards	Postgraduate Diploma *in Cyber Security and Forensics* Postgraduate Certificate *in Cyber Security and Forensics*
Awarding body/institution	University of Westminster
Teaching Institution	University of Westminster Information Institute of Technology (Sri Lanka)
Status of awarding body/institution	Recognised Body
Location of delivery	Cavendish
Language of delivery and assessment	English
Mode, length of study and normal starting month	One-year full time, two year part time evening, September
QAA subject benchmarking group(s)	Subject Benchmark Statement: Master's degrees in Computing, 2011, available online https://www.qaa.ac.uk/docs/qaa/subject-benchmark-statements/sbs-masters-degree-computing.pdf
Professional statutory or regulatory body	British Computer Society (BCS) Accreditation is pending for CITP Further Learning
Date of course validation/Revalidation	2019
Date of programme specification approval	2020
Valid for cohorts	From 2020/2021
Course Leader	Ayman El Hajjar
Course URL	westminster.ac.uk/courses/postgraduate
Westminster course code	PMCSSO5F (FT) PMCSSO5P (PT) PMCSSO6F (FT) PMCSSO6P (PT) (Sri Lanka)

HECoS code	100376 Computer and information security
UKPASS code	

Admissions requirements

There are standard minimum entry requirements for all postgraduate 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/postgraduate/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*.

Aims of the course

The cyber security and forensics course has been designed with a high degree of relevance to industry's needs. By it is nature the course is practitioner oriented and it provides highly marketable Computer Security and Digital Forensics skills.

The course is aimed at (a) graduates with a good Honours degree with a substantial Computing flavour who wish to pursue a postgraduate qualification in the field of Computer Security and Digital Forensics; and (b) practitioners who want to enhance their professional abilities, develop further their careers, update their technical skills and/or deepen their knowledge/understanding of state of the art and emerging technologies.

Overall the course aims to develop students' competences and equip them with specific technical skills so that they can either work effectively as IT security professionals who have a strong awareness of the environment in which they operate and/or be able to pursue research oriented academic study. More specifically, the course provides a balanced study that aims at producing graduates capable of:

AIM1: promoting public awareness of, and debate about, the social need for and technical challenge of digital security;

AIM2: utilising their problem-solving skills and their knowledge of various techniques / tools / methods, to deliver solutions to Computer Security related problems;

AIM3: developing cyber security and forensics as an appropriate vehicle of postgraduate academic study;

AIM4: enabling students to develop as confident and reflective digital security practitioners, able to work independently and to a professional standard;

AIM5: participating in professional networking within a rapidly developing cyber security and forensics community;

AIM6: fostering research within the field of cyber security and forensics, and enable students to carry out further study and independent academic or practice-based research;

AIM7: developing professional attitudes as well as the interpersonal and

entrepreneurial skills required of a practitioner in the industry;

AIM8: being self-motivated and independent learners, self-aware and able to reflect on their learning, and to manage their own personal development and career planning.

Employment and further study opportunities

Today's organisations need graduates with both good degrees and skills relevant to the workplace, i.e. employability skills. The University of Westminster is committed to developing employable graduates by ensuring that:

- Career development skills are embedded in all courses

- Opportunities for part-time work, placements and work-related learning activities are widely available to students

- Staff continue to widen and strengthen the University's links with employers in all sectors, involving them in curriculum design and encouraging their participation in other aspects of the University's career education and guidance provision

- Staff are provided with up-to-date data on labour market trends and employers' requirements, which will inform the service delivered to students.

Course learning outcomes

Learning outcomes are statements on what successful students have achieved as the result of learning. These threshold statements of achievement and are linked to the knowledge, understanding and skills that a student will have gained on successfully completing a course.

Knowledge and understanding (KU)

KU1: have a systematic understanding and a critical awareness of current problems and/or new insights in the area of Cyber Security and Forensics, much of which is informed by academic research and professional practice in the particular field;

KU2: have a comprehensive understanding of the techniques and approaches applicable for the design, development, implementation and maintenance of computer security systems;

KU3: show originality and innovation in the application of knowledge and techniques for designing, developing, implementing and maintaining such systems;

KU4: show critical awareness of current research issues, problems and/or insights;

KU5: understand and be able to participate within the professional, legal and ethical framework as professionals in field;

KU6: evaluate the risk posed by cyber crime to our society;

KU7: develop and apply new security strategies and forensic analysis techniques.

Specific skills (SS)

SS1: Identify, preserve and analyse sources of digital evidence;

SS2: Use and critically evaluate computer forensic software tools;

SS3: Present digital forensic evidence in a systematic manner in a court of law;

SS4: Devise and implement digital security policies;

SS5: Advise corporate clients on network security issues, evaluate current systems and suggest improvements where appropriate

SS6: Decision-making in complex and unpredictable situations; and

S7: The independent learning ability required for continuing professional development.

Key transferable skills (KTS)

Upon completion of the course students will have developed a number of general rather than discipline-specific skills which any practitioner must have if s/he is to be successful. These key transferable skills developed and assessed at postgraduate level are:

KTS1: Group working
Students will be able to (a) work effectively within a group both as group leaders and/or group members; (b) clarify tasks and make appropriate use of group members abilities; (c) negotiate and handle conflict with confidence; and (d) participate effectively in the peer review process;

KTS2: Learning resources
Students will be able to use a full range of learning resources to carry out literature reviews and engage in research activity;

KTS3: Self-evaluation
Students will be able to reflect on own and others functioning; participate effectively in the peer review process and analyse and identify ways to improve practice; continue to advance their knowledge and understanding, and recognise their development needs and to develop new skills to a high level;

KTS4: Management of information
Students will be able to competently undertake research tasks with minimum guidance; sieve through information clatter to identify relevance, to organise and present information effectively using different media;

KTS5: Autonomy
Students will be independent and self-critical learner, who can act autonomously in planning and implementing tasks and who will be able to guide the learning of others;

KTS6: Communication
Students can engage confidently in academic and professional communication with others, reporting on action clearly, autonomously and competently;

KTS7: Problem solving
Students have independent learning ability required for continuing professional study, making professional use of others where appropriate.

Some of these skills, such as Problem-Solving skills and Communication skills, are intrinsic to the nature of the course and thus they have been assessed / developed by each and every assessment component. For other skills, like group working, effort has been made to be included in as many modules as possible because ability to work effectively with/within a group, to clarify/allocate tasks, negotiate load and resolve conflict are important skills that IT professionals involved in IS design should have.

Learning, teaching and assessment methods

Learning:

The learning strategies employed on the course vary depending on the module and the learning outcomes for each module. The delivery of most of the modules involves teaching using traditional formal lectures and 'structured lectures', where lecturing is broken up by periods of student-led activity. The lectures are used to provide a firm grounding in the theory, methods and techniques relevant to the module's topic. Lectures are usually supplemented by further instructor led sessions, where theoretical or practical in nature problems are addressed. During these sessions' students will attend problem solving tutorials, sometimes working alone, often working in groups, sometimes working on paper, often working at a PC or workstation, always with a member of staff guiding the work or on hand to help resolve problems. To integrate the knowledge gained in individual modules common case studies, where possible, are used across modules, with each module tackling different aspects of the same problem. Modules with a highly technical and practical content are typically delivered in the form of workshops. These take place in the forensics lab and they combine material normally covered in a lecture with practical/hands-on exercises. In particular, the various concepts / constructs of the module's topics are introduced in short bursts and they are followed by a series of practical exercises that aim at enabling students to appreciate these concepts / constructs and understand how they can be used. This approach encourages students to actively participate in the development of a solution by allowing them to (a) express their thoughts; and (b) get immediate individual feedback from peers and/or the instructor. Finally, there are also seminar sessions in which students will present work to their classmates and assess each other's work.

The project is probably the most important aspect of the Master's programme. It plays a unifying role in the course by providing, in effect, the equivalent of a programme of integrated assignments which draws directly on all of the taught modules of the course. Students are expected to work on the project that is on a topic that each student has chosen, in the summer months after the end of the taught part of the course under the supervision of a member of academic staff. Generally, there are three types of projects: (a) projects proposed by students themselves (typically such projects are based on idea(s) a student has come up with that were developed following a supervisor input to an appropriate for the level and standard project); (b) projects based on an idea suggested by teaching staff that a student has researched and developed to an appropriate for the level and standard project; and finally (c) work-based projects, the latter of which, in most cases, are undertaken by part-time students.

To help students build the required background for their project and develop further their research skills, students are required to take a project preparatory module as part of which they are introduced to various project areas; choose the topic/area of their project; are allocated a project supervisor who, in most cases, has research interests in the area of a student's chosen project topic; research the area of their project; and devise a proposal detailed enough that will enable them to complete their project.

The supervisor acts in effect as someone who will guide students throughout the various phases of the project and who students will turn to in order to discuss their project work and receive feedback on the progress made and to have informed discussions on technical and research matters related to their project.

Supervisors will also help students (a) decide on the scope of the project; (b) devise a project plan; (c) monitor their progress and adhere to target dates on provides; and (d) on how to tackle the writing up of the project report.

Teaching: To support students in their studies and to allow access to module materials and course related information web-based teaching materials are used routinely. The modules' pages on the University's Virtual Learning Environment and/or the faculty's intranet pages are used as repositories for lecture notes, presentation transparencies, course/assessment schedules, coursework (including feedback) and occasionally for assessment purposes. The course recognises the importance of individuals being able to function equally well both as individuals and as members of team; thus, group activities are encouraged and promoted. To support and encourage student face to face interaction and collaborative work through exchange of emails, files, and online discussions, the facilities offered by the University's Virtual Learning Environment called Blackboard) are commonly utilised. Finally, to summarise, teaching and learning strategies involve the use of:
- Case studies, to improve students' analytical and problem solving skills;
- Use of specialised software tools and packages for Cyber Security and forensics (open source and proprietary closed sources)
- Presentations from outside speakers with industrial experience, to enable students see how the taught material is applied in industry;
- team/group work, to enable students develop further their teamwork skills to work effectively in a professional environment

Assessment: All the taught modules in the programme are entirely assessed through coursework. The approach taken in relation to assessment is that assessment is an integral part of the learning process; thus, assessment is designed to be fit-for-purpose in demonstrating the achievement of the specific module learning outcomes. The general principles governing assessment on the course are:
- A variety of assessment methods are employed fit-for-purpose to measure particular learning outcomes;
- The choice of assessment method(s) employed provides an opportunity for new learning and contributes to the learning process;
- timely and formative feedback is given for all assessments;
- Assessment is criterion-based, i.e. assessed work is marked using clearly stated assessment criteria, finally,
- In selecting assessment methods consideration is given to maintaining an acceptable and balance assessment loading.

Course structure

This section shows the core and option modules available as part of the course and their credit value. Full-time Postgraduate students study 180 credits per year.

All students will take the core modules which are designed to give a comprehensive introduction to this specialist field. Optional modules are divided into two themes. You can then follow the theme of your choice and choose options modules either from the Cyber Security theme or the Digital Forensics theme. In addition, all students will complete a project module.

In order to be awarded a Master's in Cyber Security and Forensics, a student must pass modules worth at least 180 credits and attempt modules worth no more than 240 credits.

Credit Level 7				
Module code	**Module title**	**Status**	**UK credit**	**ECTS**
7BUIS014W	Cyber Security Evidence and Procedure	Core	20	10
7COSC003W	Fundamentals of Security Technology	Core	20	10
7COSC007W	Network Security	Core	20	10
7COSC012W	MSc Project	Core	60	30
7BUIS022W	Cyber Security Applications	Option	20	10
7CSEF002W	Cyber Security Threats and Countermeasures	Option	20	10
7BUIS020W	Risk Management	Option	20	10
7COSC001W	Advanced Computer Forensics	Option	20	10
7COSC006W	Computer System Tools	Option	20	10
7COSC008W	Data Recovery and Analysis	Option	20	10

Please note:
- Not all option modules will necessarily be offered in any one year. In addition, timetabling and limited spaces may mean you cannot do your first choice of modules.
- Students choices of optional modules are subject to approval by the course leader.

Professional Body Accreditation or other external references

Professional body accreditation
This master's degree has been accredited by BCS - The Chartered Institute for IT for the purposes of fully meeting the further learning academic requirement for registration as a Chartered IT Professional. The accreditation is a mark of assurance that the course meets the standards set by BCS and it entitles you to professional membership of BCS, which is an important part of the criteria for achieving Chartered IT Professional (CITP) status through the Institute. More information on BCS and membership paths can be found at www.bcs.org. Please note that accreditation is pending for CITP Further Learning on the reviewed course.

Academic regulations

The current Handbook of Academic Regulations is available at westminster.ac.uk/academic-regulations. In some cases course specific regulations may be applicable.

How will you be supported in your studies?

Course Management

The course has a Course Leader, who is responsible the day to day running of the course, has overall responsibility for the academic management and organisation of the course and the development of the curriculum, and who reports to the Head of the School of Computer Science and Engineering and through him/her to the Head of the College of Design, Creative and Digital Industries.

The Course Leader, who is also the Admissions Tutor for the course, is assisted in his/her role by an Examinations Officer, a Projects Co-ordinator and the Course Team. The Course Team comprises the Course Leader and all the members of staff who teach on the course.

Typically, each module is delivered by a module team. Each module has a Module Leader, who is responsible for co-ordinating the module team and for the delivery, resourcing and smooth running of the module.
Each student is allocated a Personal Tutor, who provides advice and guidance on academic matters, e.g. on choosing/planning which option modules to take, gaining further study skills, or any matters that may be affecting your studies, such as issues financial difficulties, illnesses, stress caused by bereavement, etc. The Personal Tutor is a member of the academic staff who will be familiar with your programme of studies (quite frequently, the Course Leader is also your Personal Tutor).

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.

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 appointments. Further information on the Academic Learning Development Centre can be found at 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[1] 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.

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[1] Students enrolled at Collaborative partners may have differing access due to licence agreements.

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. 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.

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 important to the University and student views are taken seriously. 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.

- The University also has an annual Postgraduate Taught Experience Survey or PTES which helps us compare how we are doing with other institutions, to make changes that will improve what we do in future and to keep doing the things that you value.