



LEEDS  
BECKETT  
UNIVERSITY

# Course Specification

## MEng Cyber Security and Digital Forensics

Course Code:CSDFM

2021/22

# **Award & Title MEng Cyber Security and Digital Forensics (CSDFM)**

## **Applicant Facing Course Specification for 2021/22 Undergraduate Entrants**

**Confirmed at 03/2021**

### **General Information**

<b>Award</b>	Master of Engineering Cyber Security and Digital Forensics
<b>Contained Awards</b>	Bachelor of Science with Honours Cyber Security and Digital Forensics  Bachelor of Science Cyber Security and Digital Forensics  Diploma of Higher Education Cyber Security and Digital Forensics  Certificate of Higher Education Cyber Security and Digital Forensics
<b>Awarding Body</b>	Leeds Beckett University
<b>Level of Qualification &amp; Credits</b>	Level 7 of the Framework for Higher Education Qualifications, with 120 credit points at each of Levels 4, 5, 6 and 7 of the UK Credit Framework for Higher Education (480 credits in total).
<b>Course Lengths &amp; Standard Timescales</b>	<p>Start dates will be notified to students via their offer letter. The length of the course is confirmed below and modes of delivery will be confirmed prior to the start date in line with Government guidance:</p> <ul style="list-style-type: none"><li>• 4 years (full time, campus based)</li><li>• 5 years (with optional 30-week work placement)</li></ul>
<b>Location(s) of Delivery</b>	Headingley Campus, Leeds
<b>Entry Requirements</b>	Admissions criteria are confirmed in your offer letter. Details of how the University recognises prior learning and supports

credit transfer are located here:

[www.leedsbeckett.ac.uk/studenthub/recognition-of-prior-learning](http://www.leedsbeckett.ac.uk/studenthub/recognition-of-prior-learning).

Admissions enquiries may be directed to:

[AdmissionsEnquiries@leedsbeckett.ac.uk](mailto:AdmissionsEnquiries@leedsbeckett.ac.uk).

### **Course Fees**

Course fees and any additional course costs are confirmed in your offer letter. Fees enquiries may be directed to [Fees@leedsbeckett.ac.uk](mailto:Fees@leedsbeckett.ac.uk).

### **Timetable Information**

Timetables will be made available to students during induction week via:

- i) The Student Outlook Calendar
- ii) The Student Portal (MyBeckett)
- iii) The Leeds Beckett app

Any difficulties relating to timetabled sessions may be discussed with your Course Administrator.

**Policies, Standards and Regulations** ([www.leedsbeckett.ac.uk/academicregulations](http://www.leedsbeckett.ac.uk/academicregulations))

There are no additional or non-standard regulations which relate to your course

### **Key Contacts**

**Your Course Director** Dr Pip Trevorrow - [P.Trevorrow@leedsbeckett.ac.uk](mailto:P.Trevorrow@leedsbeckett.ac.uk)

**Your Academic Advisor** To be confirmed on arrival

**Your Course Administrator** Claire Howson - Email: [C.Howson@leedsbeckett.ac.uk](mailto:C.Howson@leedsbeckett.ac.uk)

### **Sandwich or Other 'In Year' Work Placement Information**

#### **Summary**

The course offers an optional Sandwich (placement) opportunity for a 30-week duration. The placement takes place between year 2 and 3 (level 5 and 6) of the course. Whilst an optional activity, students are strongly encouraged to take this chance to work within a suitable institution/organisation in order to get some real life experience and add to their employability skills. Students will be expected to find their own placement, though will be supported by our Placement Team through searching, CV writing, interview practice, and networking with potential placement institutions. Whilst on placement the students will have an in-house placement supervisor in addition to a Leeds Beckett staff supervisor who will maintain regular contact with the student and will arrange 2 visits during the 30-week placement. The placement is a pass/fail. Failing the placement, or choosing not to take a placement, does not impact upon the student's progression to level 6 but the end award will not carry the 'Sandwich' recognition.

### **Length**

The Placement is 30 weeks' duration taken between years 2 and 3 (levels 5 and 6). The institution in which the placement is taken will be different for each student.

### **Location**

The institution in which the placement is taken will be different for each student and will depend upon the type of placement sought for and secured.

### **Other 'In Year' Work Placement Information**

#### **Summary**

Work placement or volunteering opportunities may be supported throughout study at the University, informally.

#### **Length**

Varied as appropriate for opportunity

#### **Location**

Any location may vary, dependent on the opportunity.

### **Professional Accreditation or Recognition Associated with the Course**

**Professional Body**                      British Computer Society (BCS) - The Chartered Institute for IT.

#### **Accreditation/ Recognition Summary**

A graduate meets some or all of the educational requirements for registration with BCS as a Chartered IT Professional (CITP). BCS will not accredit until graduates have exited the award.

The team is currently applying for accreditation with the National Cyber Security Centre (NCSC).

### **Course Overview**

#### **Aims**

The aim of the course is to provide cyber security and digital forensics skills for students wanting to embark on a career in either of these fields, but who wish to have a deeper understanding of the underpinnings of both disciplines than is usually covered in a single honours course. Students who undertake the course will develop a critical understanding and application of the two subject areas, and be in a position to perform digital forensic analysis and/or implement cyber security mechanisms into any business they obtain employment with at a higher masters' level of competency.

With an increase in the use of digital devices within every walk of life this means that there is not a single crime that a digital device cannot be linked to. There is an ever growing demand for digital forensic techniques as the number of digital devices and the volume of data that can be stored

rapidly increases. Cyber attacks are rising: the impact on companies both in terms of the financial implications and security breaches is significant and of concern. Companies and institutions are bound by the General Data Protection Regulation (GDPR), which requires that data be kept secure and accurate. Companies and institutions are only too aware of the legal implications of security breaches and leaked data and are therefore implementing more rigid and pronounced cyber security and management policies.

With the ever increasing use of digital devices and the risks posed by them, and an increase in recent years of cybercrime, it is commonly understood that the skill sets required for cyber security and digital forensics are essentially the same, and are complementary where they differ (or any differences are complementary). Students with the dual skill set are not only ultimately in the position to undertake a more rigorous digital forensic analysis, but also to implement more robust security mechanisms. Fundamental to this is the understanding of computer systems and the broader computing field which is addressed throughout the levels of the course.

Students on the MEng Cyber Security and Digital Forensics course will learn how to test the security of computer systems and networks, and be able to analyse the systems for evidence of breaches following evidential standards. Students will learn through practical applications on our bespoke Hactivity system designed and created, in house, to replicate real world business systems and potential attacks. Students will gain expertise in the use of digital forensic techniques and analysis through appropriate tools, commercially used in industry (Encase, XRY) and open source variants (Autopsy, FTK Imager), and will develop an understanding of the motivation for crimes. Students will also work with employers, lawyers and experts to gain experience of preparing work for use by courts and customers and subsequently presenting it.

Progression through to the masters stage (level 7) of the MEng Cyber Security and Digital Forensics course will involve gaining specialism in the more challenging areas of digital forensics such as image and video forensic investigations. In security areas students will gain knowledge and expertise in software security exploitation development and the analysis and implementation of security mechanisms to defend and analyse systems. The final level also develops students' knowledge in research practices and advanced scholarship which are utilised through a research or practical based Masters dissertation project.

The two subject areas have many facets, and therefore the numbers of optional modules within the award are limited. This allows the teaching team to cover the two subject areas to the depth expected of a graduate with such a degree.

The programme will provide a mix of academic and practical content; provide students with the theoretical knowledge to excel in their field and the practical experience to be able to physically implement their skills. The course will allow students who are unsure as to which field to focus on, to become proficient in both to a masters' level of understanding; creating additional career paths.

The course aims to prepare students for a career in the cyber security and/or digital forensics industry working with small consultancies or large organisations, including the police. However, the course will also prepare students for any career in the IT sector including software development,

web design, IT network management and database administration within business, voluntary or public sectors.

### **Course Learning Outcomes**

At the end of the course, students will have:

- A systematic understanding of key aspects of cyber security and digital forensics, including acquisition of coherent and detailed knowledge, at least some of which is at, or informed by, the forefront of the discipline
- An ability to deploy accurately established techniques of analysis and design that encompass internationally recognised standards
- A wide breadth of understanding that enables students to devise and sustain arguments and solve problems using ideas and techniques, some of which are at the forefront of cyber security and digital forensics practice, and describe and comment upon particular aspects of current research, or equivalent advanced scholarship
- The skills and understanding to undertake projects to a professional industry recognised standards, within cyber security and digital forensics, by the consistent application and review of development, management and evaluation methods and techniques
- An ability to independently undertake research and critically evaluate arguments, assumptions, abstract concepts and data (that may be incomplete), to make judgements, and to frame appropriate questions to achieve a solution or identify a range of solutions to a problem.
- A detailed and critical understanding of the legal, social, ethical and professional issues pertaining to cyber security and digital forensics and which have a significant influence on professional practice in these fields.
- Demonstrate originality and synthesis in the application of theory and techniques, drawn from earlier studies, through the production of significant industry and research based projects.

### **Teaching and Learning Activities**

#### **Summary**

For each module students will normally receive a weekly lecture followed by a tutorial or practical lab based session(s). In addition, some modules will be supplemented with optional drop-in workshop sessions. These are supplemented with a programme of guest speakers and/or industry led seminars. This structure is preferred within such a vocational award where students are learning specialised material for a specific career.

This is a very hands-on subject area where theory alone would be unlikely to allow a student to achieve successful employment in this area. Practical exercises allow for students to implement their theoretical learning and see how it relates to industry. Practical solutions are achieved through the replication of exercises such as compromised computer systems and mobile devices that students

must analyse – similar to that as found in industry. Many of these examples are available through open source community projects but are also built in-house when suitable external material is not available.

The use of a project module, modelled around a small group directed design and build of a product, at Level 6 allows students to develop communication skills with their peers, this will include where possible, mixing with other cultures and individuals that they may not have originally chosen to work with as they are outside of their direct friendship group. Any issues that arise within group work such as difficulties with other group members are carefully managed through distanced support of the group where possible, so as to get the students to deal with the issues themselves. Where distance support is not possible tutors will directly resolve the issue working with the group to rectify and identify solutions.

Students are encouraged to debate within a variety of learning environments, including in-class and through the VLE discussion boards and additional chat applications where appropriate – this helps to develop respectful appreciation of their peers. Through encouraging students to use industry forums and scholarly research, students interact with a range of cultures and thinking that they are required to draw upon and evaluate within several modules.

The use of an induction session begins the process of welcoming students to the University and the course. Students are introduced to the support mechanisms in place, school and university wide, and begin to develop relationships with their peers. Students are placed into small teaching /tutorial groups that they will remain with for the first year of their study. Each group has an assigned Academic Adviser who will run weekly Course Tutorials (external to the formal teaching modules) with their group during each semester. The Course Tutorials cover elements such as academic integrity, study plans, referencing, employability; in order to help support the students learning and progression through their first year of study. Each student will have a one to one meeting with their Academic Adviser at least once a semester in order to discuss progress and help with settling into university life.

### Your Modules

This information is correct for students progressing through the programme within standard timescales. Students who are required to undertake repeat study may be taught alternate modules which meet the overall course learning outcomes. Details of module delivery will be provided in your timetable.

### Course Structure

#### Level 4

Semester 1	Core (Y/N)	Semester 2	Core (Y/N)
Fundamentals of Digital Forensics	Y	Ethical Hacking and Penetration Testing	Y
Computer Communications	Y	Fundamentals of Databases	Y
Fundamentals of Computer Programming	Y	Object Oriented Programming	Y

**Level 5**

<b>Semester 1</b>	<b>Core (Y/N)</b>	<b>Semester 2</b>	<b>Core (Y/N)</b>
Digital Forensic Processing	Y	Web and Network Security	Y
Cyber Security Landscapes	Y	Digital Forensics Analysis	Y
Database Systems	N	Team Project	Y
Web Application and Technologies	N		
Software Systems Development	N		

**Level 6**

<b>Semester 1</b>	<b>Core (Y/N)</b>	<b>Semester 2</b>	<b>Core (Y/N)</b>
Project (40 credits overall and continues into S2)	Y	Project (40 credits overall continued from S1)	Y
Forensic Investigative Techniques	N	Mobile Forensics Investigation	Y
Incident Response and Investigation	N	Systems Security	Y
Advanced Database Systems	N		
Advanced Web Engineering	N		
Advanced Software Engineering	N		

**Level 7**

<b>Semester 1</b>	<b>Core (Y/N)</b>	<b>Semester 2</b>	<b>Core (Y/N)</b>
Forensic Image and Video Processing	Y	Software Security and Exploitation	Y
Reverse Engineering and Malware Analysis	Y	Dissertation (40 credits)	Y
Research Practice	Y		

The option modules listed are indicative of a typical year. There may be some variance in the availability of option modules.

## Assessment Balance and Scheduled Learning and Teaching Activities by Level

The assessment balance and overall workload associated with this course are calculated from core modules and typical option module choices undertaken by students on the course. They have been reviewed and confirmed as representative by the Course Director but applicants should note that the specific option choices students make may influence both assessment and workload balance.

A standard module equates to 200 notional learning hours, which may be comprised of teaching, learning and assessment, any embedded placement activities and independent study. Modules may have more than one component of assessment.

### Assessment

Assessments at all levels (4, 5, 6 and 7) is by a broadly even mix of coursework and practical assessments.

### Workload

Overall Workload	Level 4	Level 5	Level 6	Level 7
Teaching, Learning and Assessment	264 hours	212 hours	226 hours	138 hours
Independent Study	936 hours	988 hours	974 hours	1062 hours

## Learning Support

If you have a question or a problem relating to your course, your Course Administrator is there to help you. Course Administrators work closely with academic staff and can make referrals to teaching staff or to specialist professional services as appropriate. They can give you a confirmation of attendance letter, and a transcript. You may also like to contact your Course Rep or the Students' Union Advice team for additional support with course-related questions.

If you have any questions about life at our University in general, call into or contact the Student Advice Hub on either campus. This team, consisting of recent graduates and permanent staff, are available to support you throughout your time here. They will make sure you have access to and are aware of the support, specialist services, and opportunities our University provides. There is a Student Advice Hub on the ground floor of the Rose Bowl at City Campus and one in Campus Central at Headingley. You can also find the team in the Gateway in the Leslie Silver Building at City Campus. Email enquiries may be directed to [studentadvicehub@leedsbeckett.ac.uk](mailto:studentadvicehub@leedsbeckett.ac.uk).

Within MyBeckett you will see two tabs (Support and Opportunities) where you can find online information and resources for yourselves. The Support tab gives you access to details of services available to give you academic and personal support. These include Library Services, the Students' Union, Money advice, Disability advice and support, Wellbeing, International Student Services and Accommodation. There is also an A-Z of Support Services, and access to online appointments/registration.

The Opportunities tab is the place to explore the options you have for jobs, work placements, volunteering, and a wide range of other opportunities. For example, you can find out here how to get help with your CV, prepare for an interview, get a part-time job or voluntary role, take part in an international project, or join societies closer to home.