



LEEDS
BECKETT
UNIVERSITY

Course Specification

MEng Robotics and Automation

MENRA

2020/21

Undergraduate Material Information
IMPORTANT INFORMATION FOR APPLICANTS/PROSPECTIVE STUDENTS

Version date: July 2020

Undergraduate Material Course Information **Summary**

Revised Course Structure and Delivery Information for Academic Year 2020/21 in Response to Coronavirus Covid-19 and Associated Public Health England Guidance as at 3 July 2020

PART 1 of 2: Important General Information about Course Delivery for Leeds Beckett University Awards in 2020/21 (Information Specific to Your Course is Provided in PART 2)

Introduction

This document contains important information about Leeds Beckett University's planned approach to course delivery and assessment in 2020/21. It provides an update to the information previously available in our online prospectus. You should read this document carefully so that you are aware of any changes that affect your course.

Information is provided in two parts:

The University is informed by Public Health England (PHE) Covid-19 advice and guidance for maintaining a Covid-secure learning and working environment. We have made arrangements to continue to provide a high-quality educational experience in a way that protects the safety and wellbeing of both students and staff. We are engaging closely with Leeds Beckett Students' Union to inform the arrangements and will also be informed by feedback provided by our individual students.

Public Health England guidance continues to evolve, so the arrangements for delivery of your course and use of the campus may need to change during the academic year to continue to protect students and staff.

The taught content advertised at each level of study, or its equivalent, will be delivered across the academic year 2020/21. We have identified an appropriate mix of blended learning – a mix of face-to-face, on-campus, online and digital content and teaching and learning for each subject, reflecting what will maximise learning as well as supporting more vulnerable learners and enabling the university as a whole to minimise transmission risk.

Covid-19 social distancing measures will be implemented during 2020/21 for teaching, learning, assessment and student support.

In the event of further government lockdowns, either local or national, we will prioritise digital and online learning and support to enable students to continue with their studies.

If there is an easing of Covid-19 restrictions, we will continue to provide blended delivery for teaching block 1 or semester 1 in 2020/21. We will keep teaching blocks 2 and 3 or semester 2 under review, informed by Public Health England advice. We may revert to different proportions of on-campus learning and online learning delivery later in the academic calendar year or a later teaching block. Learning will remain accessible for students who are unable to attend on campus sessions.

How we will communicate with you

We have sent information to applicants who have accepted an offer by email on the plans for delivery of your course in 2020/21, the academic calendar (teaching block delivery or alternative) applicable for your course and on the options available to you as a prospective student, to enable you to make informed choices.

As the situation evolves, further information on local course delivery arrangements will be provided to you in emails from your School.

In addition to the course specific information set out in this document and the above communications, the University's Covid-19 microsite contains information for students and applicants, including information relating to University accommodation and University facilities and services. The Covid-19 microsite is regularly reviewed and updated as the situation, advice and planning evolve and is available at:

<https://www.leedsbeckett.ac.uk/COVID19/#tabplaceholder2>.

Key terms and conditions

Further important information for applicants and students is available on our web site: <https://www.leedsbeckett.ac.uk/information-for-applicants-and-students/>. This includes information about the student contract, fees and funding, your rights of cancellation, the student protection plan and the University complaints process. It is essential that you read the information on this webpage carefully as it sets out the rights and obligations that will form the contract

between you and the University upon accepting an offer and information about how to make a complaint.

Start dates

Our academic year will begin at the normal time. Start dates will be notified to direct applicants via their offer letter or for UCAS applicants, via UCAS Track. The length of the course is confirmed in the information about your course in Part 2 of this document below.

Location of delivery

In academic year 2020/21, it is planned that your course will be delivered via a blend of online and digital learning and on-campus teaching and learning, with the necessary Covid-19 social distancing and other measures in place on campus informed by Public Health England advice and guidance.

Information on how blended teaching and learning will be delivered and the location of any on-campus delivery is provided in a subsequent section of this document entitled '**Teaching and Learning Activities**'.

Information on the delivery of placements and other off-campus learning opportunities is provided in a subsequent section of this document entitled '**Placements and Other Off-Campus Learning Opportunities**'.

Course Fees

Your course fee is stated in your offer letter. The course fee published for 2020/21 on the University's Online Prospectus and included in your offer letter has not changed. Other additional costs remain as published on our original Online Prospectus information in addition to the areas of costs outlined below.

The course will be delivered via a blended approach that includes online teaching and learning, digital learning and on campus sessions. If a further lockdown is necessary then delivery will be continued and supported via online and digital learning. Students are advised that they will need a personal digital device for this purpose. The University's wide range of student support services available for students also includes a laptop loans scheme. Students may wish to bring an existing personal device or purchase or lease a laptop or similar device for their personal use which would be an additional cost. The costs of this would vary depending on your individual requirements but can be in the region of £400-800 depending on the device.

The University's wide range of student support services available for students also includes a laptop loans scheme. The University is developing a means-tested Covid-19 Financial Assistance Package to support students to acquire a laptop should this be needed. Students may also apply for a living expenses fund for unexpected personal hardship as a result of the Covid-19 Crisis.

Students will need to follow the Public Health England advice and any specific national requirements for maintaining personal safety and hygiene to protect themselves and others from the Covid-19

risks. These personal safety measures such as the wearing of face coverings will be an additional cost that students need to consider.

Timetable Information

This course will be scheduled using a teaching block/semester-based delivery and will be specified in timetable information.

The 2020/21 academic calendar and term dates are available on our web site at:

<https://www.leedsbeckett.ac.uk/-/media/files/academic-calendars/2021-student-calendar-sept.pdf?la=en>

The academic year 2020/21 will start on the dates notified to you.

Taught sessions will normally be scheduled and included in your timetable. This will include on-campus sessions that you should attend. In 2020/21, depending on your course, this may also include scheduled online teaching and learning sessions where student engagement is required at a specified time and tutor pre-recorded lectures and scheduled discussion sessions. Module information will be made available online by the school for enrolled students.

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

1. The Student Portal (MyBeckett)
2. The Leeds Beckett app

You should discuss any difficulties relating to your engagement with timetabled sessions with your Course Administrator.

Policies, Standards and Regulations (www.leedsbeckett.ac.uk/public-information)

Covid-19 social distancing measures will be in place for teaching, learning, assessment and student support in 2020/21. This means that there will be operational requirements and protocols in place for the way in which your course is delivered and the way in which University activities, facilities, and spaces operate which students and staff will need to follow.

In the event of further government lockdowns either local or national in response to Covid-19, we will prioritise digital and online learning and support to enable students to continue with their studies. We may need to implement approved emergency Covid-19 pandemic academic regulations to take account of the impact of Covid-19 general extenuating circumstances.

Sandwich Placements, Other Placements and Other Off-Campus Learning Opportunities

Covid-19 response measures are likely to impact on the arrangements for placements, field trips, volunteering and other off-campus activities. If available, these are likely to operate with appropriate social distancing arrangements. Employers may reduce the availability of placement or volunteering opportunities due to the impact of Covid-19 on their operations.

The availability or type of placements with employers, study abroad or volunteering opportunities, may be restricted. The University follows the UK Government's Foreign and Commonwealth travel advice and is also informed by any specific in-country international travel restrictions or requirements.

The University's current position is that we will not facilitate outward (from UK) international/overseas placements, study abroad or volunteering activity in 2020/21. This is to protect students and minimise the risk of you being stranded abroad in the event of a lockdown and the introduction of national/local travel restrictions. We will only consider international placements for students whose domicile address is in the country of their placement.

Inward Exchange study (from other EU countries to the UK under this scheme) will be supported where these align with the teaching blocks academic calendar delivery dates. There may be other national or international travel restrictions or quarantine measures or specific work-place Covid-19 measures that impact on these opportunities.

Should the Covid-19 response and alert level be amended any activity may also be subject to Covid-19 employer, local or in-country requirements applicable at the time of the placement/activity. We will keep the position under review for teaching blocks 2 and 3 or semester 2, informed by Public Health England and the UK Government's Foreign and Commonwealth travel advice.

Students will have access to advice and support from the University careers and employability team during their studies via the online resources and support.

Further information on placements or other off-campus learning opportunities applicable to your course is provided below.

Professional Accreditation or Recognition Associated with the Course

We will prioritise face-to-face teaching and practical teaching to meet any requirements of relevant professional, statutory and regulatory bodies (PSRB) if your course includes these elements. This will ensure that your course retains its full professional status.

Specific information on applicable professional statutory or regulatory body recognition or requirements for your course is summarised below.

Teaching and Learning Activities

The way we will deliver this course and teaching, learning and assessment activities in 2020/21 will be informed by Public Health England advice and guidance on Covid-19 secure requirements and the need for social distancing for the protection of students and staff.

You will experience a blended approach to learning for 2020/21; this is a mix of face-to-face, on campus online, and digital content, teaching and learning.

We are working within the government 2 metre social distancing measures for Teaching Block 1 so we are not planning to deliver large-group teaching on campus throughout 2020/2021. This will ensure that maximum space will be available for small-group teaching.

In most cases, the taught content will also be available online so you can still access it if you are not able to attend campus due to the pandemic (for example, due to self-isolation, shielding or travel restrictions). There will be digital content and recorded lectures available online to support students who may be unable to travel to campus. In some circumstances, other formal taught sessions may also be recorded.

In the event of a further government lockdown in response to Covid-19, we will prioritise digital and online learning and support to enable students to continue with their studies and study towards achieving any specified professional statutory and regulatory body accreditation requirements where this applies.

If there is an easing of Covid-19 restrictions, we will continue to provide blended delivery for teaching block 1 or semester 1 in 2020/21. We will keep teaching blocks 2 and 3 or semester 2 under review, informed by Public Health England advice (see Introduction section above).

Further information on local course delivery arrangements will continue to be available from your School and via the School.

Students will be kept up to date with new information when this is available via this University web site.

Learning Support

Our approach to delivering student support in 2020/21

Given the planned social distancing measures in place on campus for 2020/21 to ensure safe delivery of services for students and staff, some of the arrangements for student support will be accessible online.

We are committed to ensuring you continue to have opportunities to access the learning and wellbeing support that you need over the forthcoming year. General learning spaces, including access to libraries, will be available to be booked online; and where specialist space is needed, this will either be provided: as normal; created in newly adapted spaces; or replicated as part of an enhanced suite of online resources.

We want to provide a safe environment for students and staff, so on-campus delivery of student support services will be limited. This may mean that campus-based school offices will operate within defined core office hours. However, full access to advice, learning support and specialist services will be delivered via telephone, email, video calls and online live chat. The Students' Union will also be implementing social distancing arrangements for student advice services.

Access to Library support in 2020/21

The Library offers access to thousands of resources via MyBeckett or the Library website (<http://libguides.leedsbeckett.ac.uk/home>) which also provides full details of all our services.

In response to Covid-19, and the need for social distancing for the protection of students and staff, the libraries will be available via a booking system in 2020/21 for students to study, access PCs and laptops, printer/ copiers, and other equipment, and to use the books and journals.

The Library and Student IT Advice Service is available by online chat, email or phone, and provides support on using the University's online and digital services, finding information, borrowing, Office 365, MyBeckett, online meetings, saving your work, passwords, etc.

- online (including 24/7 chat): http://libguides.leedsbeckett.ac.uk/contact_us
- by phone - 0113 812 1000 (24/7 IT support)

The Library Academic Support Team can help you develop your academic skills such as critical thinking, academic writing and analysing data, and research skills such as how to find, use and evaluate information for your studies. The team liaises with your lecturers to provide the information resources you need for your subject and to arrange academic skills sessions to support you in your studies. They also have a wide range of short tutorials available on the Library's YouTube channel: <https://www.youtube.com/channel/UCCFd5u75zmy00EnkM9F2zPQ>

Support from your School

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 university specialist support services as appropriate. They can also arrange for a confirmation of attendance letter, and a transcript on your behalf. You may also like to contact your Course Representative or the Students' Union Advice team for additional support with course related questions.

Student Advice and Support

If you have any questions about life at our University in general, you may contact the Student Advice Hub to speak to one of our Student Services Advisers. This team, consisting of recent graduates, are able 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. Our Student Advice Hub will be operating via live chat, video, telephone and email services. Telephone lines - 0113 812 3000 will open as usual 09.00-17.00 Mon-Fri. You can book an appointment via telephone or online video chat with an adviser via the link at: <https://www.leedsbeckett.ac.uk/studenthub/student-experience-team/>. This is where contact details for all specialist support services can also be found. You can also email the team at studentadvicehub@leedsbeckett.ac.uk.

Range of Support Services Available

There is a range of support for disabled or vulnerable students. Any student with a disability, who may or may not have declared this to the University and wishes to discuss their learning support for the year ahead or their status as a Covid-19 extremely vulnerable person, should contact their Disability Adviser for their School who is based in Student Services to discuss their support needs in the first instance. The service contact details are disabilityadvice@leedsbeckett.ac.uk or telephone 0113 812 5831. Students who are classed as Covid-19 Extremely Vulnerable (i.e. you have received a Shielding Letter from the NHS) but who do not regard themselves as disabled, and have not registered with the Disability Team, should discuss any support arrangements they may need, directly with their Course Director and if resident in halls, their Residential Life Team.

Once enrolled, you will have access to our virtual learning environment, MyBeckett. Within this system 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.

You can also access details of all University student support teams at our web A-Z of Services. This can be found at <https://www.leedsbeckett.ac.uk/studenthub/student-support/>. Here you can obtain further information including service contact details, access self-help resources or book an appointment with a range of support services.

In order to provide you with information on student services support in 2020/21 in response to the changing Covid-19 position, updated information will be provided on our University Covid-19 microsite.

Part 2: Important Information Specific to Applicants/Prospective Students MEng Robotics and Automation for 2020/21

Award	Masters of Engineering with Honours, Robotics and Automation
Contained Awards	Bachelor of Engineering with Honours, Robotics and Automation Bachelor of Science, Robotics and Automation Diploma of Higher Education, Robotics and Automation Certificate of Higher Education, Robotics and Automation
Awarding Body	Leeds Beckett University
Level of Qualification & Credits	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).

Course Lengths & Standard Timescales

The standard start date for Leeds Beckett University induction week is reproduced below and relates to the majority of students starting a course in September 2020. A proportion of courses have alternate start dates which are displayed on the online prospectus and additionally will be notified to the students concerned via the offer letter. Non-September starters will also have their start dates confirmed in their offer letters.

- 3 years (full time, campus based)
Starts 21st September 2020/ Ends June 2023
- 6 years (part time, campus based)
Starts 21st September 2020/ Ends June 2026

Timetable Information

This course will be taught via teaching block at levels 4,5,6, and via semester-based delivery at level 7. Details of on campus and other scheduled sessions will be confirmed in your timetable.

Further information on learning and teaching activities and your modules is provided in a later section of this document.

Placements and Other Off-Campus Learning Opportunities

Should you decide to undertake a placement year, you will automatically be enrolled on the *Work Placement* module. You will then be supported during this placement by a named member of the Engineering teaching team and passing this *Work Placement* module enables the student to graduate with award title *MEng Robotics and Automation (Sandwich)*. Failing the module, or withdrawing from the placement, has no consequences for your academic progression: all students who pass Level 5 are eligible to undertake study at Level 6. Similarly, if you choose not to take the placement year, then you will automatically resume studies at Level 6 in the following academic year.

Even if you elect not to undertake a full placement year, you will still be encouraged and supported to undertake a shorter placement over the summer months between Level 4 and Level 5, or between Level 5 and Level 6. You will prepare for the shorter summer placements in the same manner as for the longer placements and will be supported by the *Employability and Placement* lead to find an apply for those opportunities. However, whilst valuable, these shorter summer placements will not be captured by the *Work Placement* module and so you will be ineligible for the '(Sandwich)' appellation to your degree title.

The availability or type of placements with employers may be restricted. Students will be advised about any new information or required revisions to confirmed arrangements as soon as this information becomes available.

Length

The placement will be a minimum length of 32 weeks but can be longer by negotiation. All placement activity must be undertaken by the end of Level 4 and the September start date for the following year.

Location

You may be placed with various companies in the UK (or internationally if applicable). Further information on the placement process is provided by the course Employability Lead prior to option choices being made.

Policies, Standards and Regulations (www.leedsbeckett.ac.uk/public-information)

For this award, there is an Admissions exemption for this course, which was agreed on the 2018-11-14

[The Level 3 tariff] must include 40 points from a Maths or Science related subject. If you are studying Biology, Chemistry or Physics to meet this requirement you must also achieve a 'Pass' in the practical assessment, where that practical assessment is separated (from 2017)

Note: The correct title for the Level 6 contained award of the ordinary degree is *BSc Robotics and Automation*. This Level 6 contained award **does not** satisfy the PSRB requirements for an accredited degree programme as it does not fully meet the Engineering Council's guidance on the assessed

learning outcomes for IEng under the *Accreditation of Higher Educational Programmes* version 3.0. The change in the title of the award is therefore necessary to differentiate between the main award and the contained award.

Specifically, the title of any contained award **must** adhere to the Accreditation Policy R1, *Programme Title*, of the IET (Academic Accreditation Information Pack for Higher Education Institutions, Academic Accreditors and Professional Engineering Institution Staff. The Institution of Engineering and Technology, July 2018), which states

The title of the accredited degree programme must not be identical to an unaccredited programme awarded by the same Higher Education Institution.

For the ordinary degree, you will not have met the Course Learning Outcomes of the honours award; but instead you will be expected to have demonstrated the Course Learning Outcomes stated in Section 3 below.

Key Contacts

Your Course Director Dr. David Love (david.love@leedsbeckett.ac.uk)

Your Academic Advisor This will be sent to you in your Induction Week

Your Course Administrator cctegadmin@leedsbeckett.ac.uk

Professional Accreditation or Recognition Associated with the Course

The Institution of Engineering and Technology (IET)

Accreditation/ Recognition Summary

Currently this course is not accredited by any member of the UK Engineering Council. It has been designed to align to the UK Standard for Professional Engineering Competence (UK-SPEC) Third Edition, as laid out in the UK Engineering Council's Accreditation of Higher Education Programmes (AHEP) as being suitable for the academic component of registration as an Incorporated Engineer (IEng). The IEng standard is recognised internationally as showing your ability to use your theoretical knowledge to solve problems in developed technologies using well proven analytical techniques; your application of your knowledge to deliver engineering projects or services using established technologies and methods; your ability to be responsible for project and financial planning and management together with some responsibility for leading and developing other professional staff; your effective interpersonal skills in communicating technical matters and your commitment to professional engineering values.

Upon completion of the award, the practical requirements for Professional Registration would typically take between three to five years to achieve. This period may be significantly reduced by your choice of placement; indeed many companies will also assist you in gaining Professional Registration as part of your graduate training programme.

Course Overview:

Yorkshire, and the broader North of England region, is renowned both nationally and internationally as a source of high-quality food and ingredients. Food and related industries also represent the largest sector of the UK national manufacturing base: and has done so since 2010 (ONS, 2018)¹. Historically, however, the food sector is also one of the most reliant on manual labour in its output; despite the widespread automation of key processes (EEF, 2017)². Without a significant increase in either the productivity of the existing workforce or a broader share of the labour market, therefore, the food sector faces a strategic challenge in achieving its potential. Addressing robotics and automation challenges in the food sector is therefore one of the key concerns for one of the Governments six Sector Deals announced following the 2017 *Industrial Strategy*^{3,4}.

However, as the both the original *Industrial Strategy* and the response make clear, the food sector is far from the only sector in the UK facing a challenge of strategic investment required to increase sector productivity (HC 1093, 2019)⁵. Indeed, the whole the UK economy must undergo a shift towards more advanced robotics and automation to remain amongst the world's leading economies (Rhodes, 2018)⁶. And this historic shift must be undertaken against a background of underinvest in the UK (EEF, 2017)⁷, and changes to the post-16 education policies (Cond. 9280, 2016)⁸.

¹ **GDP Output Approach – Low-Level Aggregates** (2018). Office for National Statistics, 9th November 2018. Available from:

<<https://www.ons.gov.uk/economy/grossdomesticproductgdp/datasets/ukgdpolowlevelaggregates>> [Accessed 18 December 2019]

² EEF (2017). **How Weak is Manufacturing Investment in the UK?** [Online]. Available from:

<<https://www.eef.org.uk/campaigning/news-blogs-and-publications/blogs/2017/oct/how-weak-is-manufacturing-investment>> [Accessed 18 December 2019]

³ **Forging Our Future: Industrial Strategy – The Story So Far** (2018) London: HMSO. Available from:

<<https://www.gov.uk/government/publications/forging-our-future-industrial-strategy-the-story-so-far>> [Accessed 18 December 2019]

⁴ **Industry Strategy** (2017) London: HMSO. Available from:

<https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf> [Accessed 18 December 2019]

⁵ HC 1093, (2017-2019). **Automation and the Future Of Work**. House of Commons Business, Energy and Industrial Strategy Committee. Available from: <<https://publications.parliament.uk/pa/cm201719/cmselect/cmbeis/1093/1093.pdf>> [Accessed 18 December 2019]

⁶ Rhodes, C. (2018) **Manufacturing: Statistics and Policy**. House of Commons Library, Briefing paper Number 01942, 12 November 2018. Available from:

<<https://researchbriefings.files.parliament.uk/documents/SN01942/SN01942.pdf>> [Accessed 18 December 2019]

⁷ EEF (2017). **How Weak is Manufacturing Investment in the UK?** [Online]. Available from:

<<https://www.eef.org.uk/campaigning/news-blogs-and-publications/blogs/2017/oct/how-weak-is-manufacturing-investment>> [Accessed 18 December 2019]

⁸ **Post-16 Skills Plan** (Cmnd. 9280) London: Department for Business Innovation and Skills and the Department for Education. Available from:

<https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/536043/Post-16_Skills_Plan.pdf> [Accessed 18 December 2019]

Working with local industrial partners, especially those in food and related sectors, this course aims to produce students capable of leading a generational transformation in manufacturing and production using advanced automation and robotics. It maintains a strong practical focus, whilst also providing a pathway from both new and established technical and vocational awards post-16, to study at Master's level. Students from this course will therefore have both a strong set of academic and theoretical resources to draw on; together with the necessary skills and industrial focus to apply those resources to solve current and future industrial needs.

As the leaders of the next generation of industrial automation and robotics within their chosen sector, it is expected that most of the students from this course will seek registration as Professional Engineers with sector relevant Professional Engineering Institute. Therefore, this course includes a significant, integrated, postgraduate element to provide the necessary platform for further study and continuing professional development.

During the course, students will also be introduced to industry standard simulation and design tools, e.g. in automation, electronic design, device simulation, engineering control, robotics, and bespoke device control systems. Introducing standard tools within the course allows students to with these (or similar) tools and develops a professional skillset of value within the engineering field. Given the likely career path of graduates of this course, specific professional skills in project management, finances and business accounting are also included with the core modules of the course.

Aims

To meet the industry need outlined above, this course is aimed at students who wish to undertake a study that has a strong technological and applied focus. Most of those students will also seek recognition after graduation as Professional Engineers, through the standards set by one or more of the Professional Engineering Institutes. Therefore, this award also aligns itself with the Engineering Council's *UK Standard for Professional Engineering Competence* (UK-SPEC), aiming to produce graduates who would qualify for registration as Incorporated Engineers (IEng). Broadly the UK-SPEC defines the qualities of and role of Incorporated Engineers as being capable of maintaining, managing and applying current and developing technologies to engineering design, development, manufacturing, construction and operation. For candidates to qualify for professional registration as IEng, they must demonstrate (Engineering Council, 2013. pg. 16)⁹

- *The theoretical knowledge to solve problems in developed technologies using well proven analytical techniques*
- *Successful application of their knowledge to deliver engineering projects or services using established technologies and methods*
- *Responsibility for project and financial planning and management together with some responsibility for leading and developing other professional staff*

⁹ Engineering Council (2013). **UK-SPEC: UK Standard for Professional Engineering Competence** [Online]. Third Edition. Available from: <<https://www.engc.org.uk/ukspec>> [Accessed 23 November 2018]

- *Effective interpersonal skills in communicating technical matters*
- *Commitment to professional engineering values.*

As with all engineering courses aiming to produce graduates capable of professional registration, an academic course can only satisfy part of the requirements for that registration. Therefore, this course aims to express its alignment with the UK-SPEC through adherence to version 3 of the Engineering Council's standard for the *Accreditation of Higher Education Programmes*, and to the subject and discipline learning outcomes defined by the Institution of Engineering and Technology (the sector recognised PSRB and Professional Engineering Institute (PEI) for Robotics and Automation). Together these learning outcomes for graduates of the award are reflected in the following course aims:

1. To facilitate the provision of a quality learning experience for each student that fosters engagement with their programme of study and promotes independent study and life-long learning.
2. To maintain a high quality, comprehensive and coherent curriculum focusing on the area of control and manufacturing, within the broader discipline of robotics that develops the underpinning principles of electrical and electronic engineering, management, entrepreneurship, digital literacy and offers a global appeal, informed by research, scholarly activity and practice to enhance each participant's career prospects.
3. To develop professionals with a sound understanding of both robotic and associated disciplines in Electronic and Electrical engineering, in a holistic approach and understanding the key features that link the two subject areas.
4. To encourage the creative and appropriate application of technology to promote innovation and enterprise through the research project whilst enhancing students' employability skills.

Course Learning Outcomes

At the end of the course, you will:

1. Possess the core knowledge and understanding of scientific principles and methods necessary for developing intelligent robotics and automated systems, some of which will be at the state-of-the-art; together with the ability to apply principles and methods drawn from the primary research literature.
2. Develop an ability analyse a system through appropriate tools, methods and techniques, developing appropriate quantitative solutions and communicate the results of those analyses in a form appropriate to academic, technical, and non-specialist audiences.
3. Be able to creatively design innovative solutions to problems including an investigation and identification of the appropriate legal, economic, social, aesthetic and environmental constraints where applicable.

4. Develop the skills to undertake projects to recognised professional standards by the consistent application and review of development, management and research-based methods and techniques.
5. On completion of the course, students will have an understanding of the context of engineering knowledge; the characteristic tools, equipment, processes and products of the discipline of electronic and electrical engineering, and be able to use the technical literature and other information sources to develop and communicate that understanding to professional peers.

Teaching and Learning Activities and Your Modules

Where possible we will provide on-site contact sessions for each module, typically at a minimum of the equivalent of one hour per module per student per week. However, and especially later in the degree, some modules may be delivered mostly or entirely online.

In all cases, the overall teaching hours will be met via a mix of onsite and off-site learning, and all module teaching could use a combination of the following delivery methods:

- Live online Lectures via suitable VoIP software (e.g. MS Teams, Adobe Connect)
- Face-to-face support session in class (when safe and where possible)
- Cloud-based remote lab sessions
- Q&A sessions
- Recorded Lectures
- Live online Demos
- Online tutorials

In the event of a further government lock-down in response to COVID-19, we will prioritise remote delivery and support to enable students to continue with their studies and meet all expected learning outcomes through their assessment. The aim of the assessment process is not only to assess the level and depth of understanding achieved but also to reinforce the learning process through the application of their studies. Assessment may be both formative and summative and will assist both tutors and students in diagnosing learning needs and in monitoring progress.

Teamwork will be assessed both at a group and individual level and includes how well each team performs in researching, managing, project planning and producing their final engineering solution.

The integrative nature of the subject area allows a number of modules to be part of one project and each element can then be assessed synoptically reducing the burden of assessment on students, while at the same time allowing deeper learning through the connection between each topic area.

The final *Production Project* will be assessed mainly through dissertation and presentation showing the research and development work required in order to arrive at the final solution. Other activities include reflection, evaluation and testing.

The School is aware of the dangers of plagiarism inherent in written assessments. Use will be made of plagiarism detecting software and the University reserves the right to viva any student to verify authorship of submitted work. Students are required to take all reasonable steps to conform to a request to participate in such a viva. Students are required to sign a declaration to the effect that their submitted work has not been the subject of plagiarism.

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.

The following structure of indicative of the delivery pattern expected **based on three terms of 10 weeks teaching for Level 4 to Level 6**. Each term will normally be patterned as eight weeks of teaching, followed by two weeks of assessment; but this pattern may vary for individual modules, and may be adjusted in response to changes required in the event of further government lockdown or other restrictions imposed.

Level 4	
Teaching Block 1	Core (Y/N)
Electrical and Electronic Principles 1	Y
Maths for Electrical and Electronic Engineering	Y
Digital Electronics	Y
Teaching Block 2	Core (Y/N)
Engineering Systems and Data Acquisition	Y
Maths for Electrical and Electronic Engineers	Y
Digital Electronics	Y
Teaching Block 3	Core (Y/N)
Computers in Engineering	Y
Engineering Design Project 1	Y

Level 5 Core Modules (2021/22 for FT students and 2022/23 and 2023/24 for standard PT students)

Level 5

Operating Systems for Robotics
Advanced Maths for Electrical and Electronic Engineering
Instrumentation and Control
Analogue Electronics
Embedded Systems
Robotics and Automation
Engineering Design Project 2

Indicative Level 5 Option Modules (delivery years as per Level 5 core modules above)

N/A

Level 6 Core Modules (2022/23 for FT students and 2024/25 and 2025/26 for standard PT students)

- Engineering Cost and Management Accounting
- Production Project
- Advanced Manufacturing Technologies

Indicative Level 6 Option Modules (delivery years as per Level 6 core modules above)

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

- Digital Signals Processing
- Engineering Control
- Engineering Simulation
- Industrial Networks
- Power Electronics

Level 7 Core Modules

Teaching at level 7 will remain 2 semesters.

- Dissertation (Double Module)
- Intelligent Systems
- Project Management
- Research Practice
- Vision and Image Systems

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 a sample of option module choices undertaken by a typical student. They have been reviewed and confirmed as representative by the Course Director.

A standard module equates to 200 notional learning hours, which may be comprised of teaching, learning and assessment, placement activities and independent study. Sandwich placement years spent out of the University are not be included in the calculation unless they are credit bearing and attributed to a level of the course. Modules may have more than 1 component of assessment. Levels 4, 5, 6 and 7 are assessed by a broadly even mix of coursework and examinations, with some practical assessments.

Overall Workload	Level 4	Level 5	Level 6	Level 7
Teaching, Learning and Assessment	288 hours	216 hours	228 hours	216 hours
Independent Study	912 hours	984 hours	972 hours	984 hours
Placement (optional)	0 hours	1,200 hours	0 hours	0 hours

Learning Support Arrangements

Where possible, access to specialist software and facilities will be provided remotely. Licences for software which can be installed on your own personal devices will also be provided as part of the standard course fees; including access to Office 365 in addition to specialist engineering applications.

You are advised to consider purchasing or renting a laptop or other device to access the online provision of your course. If a further lockdown is necessary, then delivery will be also continued and supported via online and digital learning; for which again a laptop or other device will be needed. Our recommended specifications for such a device are

- **Processor:** AMD Ryzen 5 or Intel Core i5
- **Memory:** 8GB minimum (16GB preferred)
- **Storage:** 256GB minimum (512GB preferred)
- **Screen Size:** 13" minimum (15" or larger preferred)
- **Operating System:** Windows 10 Home minimum (Windows 10 Professional with Linux access through Virtual Machines, WSL2 or dual-boot preferred)

Please Note: Although Microsoft Office 365 supports Apple OS X/11, most of the specialist engineering software which we use does not and will *only* run on Windows 10. Similarly, for machines running Linux, there is some specialist software which will only run on Windows 10. Therefore, some access to Windows 10 through dual-boot (Bootcamp) or a virtual machine is

strongly recommended. You will need to ensure that you have an appropriate licence for Windows 10, as this is not part of the standard University license package.

The cost of a laptop meeting the minimum recommended specification is in the region of £400 to £500, with desktop machines usually at the lower end of that range. Most of the packages used for your course are memory intensive, rather than processor intensive, and whilst a dedicated graphics card would be useful later in your degree it is not strictly required.

Social distancing and PPE are required to be adhered to in keeping with the government guidelines. These may include masks, gloves, individual responsibility for cleaning workstations and one way systems around buildings. Students will be informed of the requirements and any changes via email.