Programme specification

(Notes on how to complete this template are provide in Annexe 3)

1. Overview/ factual information

Programme/award title(s)	Foundation Degree in Industry 4.0
Teaching Institution	South Eastern Regional College
Awarding Institution	The Open University (OU)
Date of first OU validation	April 2023
Date of latest OU (re)validation	N/A
Next revalidation	April 2025
Credit points for the award	120 credits at Level 4 120 credits at Level 5 Total – 240 credit points
UCAS Code	N/A
HECoS Code	N/A
LDCS Code (FE Colleges)	N/A
Programme start date and cycle of starts if appropriate.	01/09/2023
Underpinning QAA subject benchmark(s)	Subject Benchmark Statement – QAA Engineering (2019)
Other external and internal reference points used to inform programme outcomes. For apprenticeships, the standard or framework against which it will be delivered.	Engineering Council: The UK Standard for Professional Engineering Competence and Commitment (UK-SPEC) 4th Edition (2020) Engineering Council: The Accreditation of Higher Education Programmes (AHEP) 4th Edition (2020) SERC Meta Skills Blueprint V1.0 (2022) Higher Education Credit Framework for England: Advice on Academic Credit Arrangements (2021) SEEC Credit Level Descriptors (2021) OU Engineering and Computing Level 4 and Foundation Degree Programme specifications EUR-ACE® Framework Standards and Guidelines QAA Foundation Degree Characteristics Statement
Professional/statutory recognition	

For apprenticeships fully or partially integrated Assessment.	
Mode(s) of Study (PT, FT, DL, Mix of DL & Face-to-Face) Apprenticeship	PT, FT, Face to Face
Duration of the programme for each mode of study	2 Years Full Time 3 Years Part Time
Dual accreditation (if applicable)	N/A
Date of production/revision of this specification	February 2023

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

More detailed information on the learning outcomes, content, and teaching, learning and assessment methods of each module can be found in student module guide(s) and the students handbook.

The accuracy of the information contained in this document is reviewed by the University and may be verified by the Quality Assurance Agency for Higher Education.

2.1 Educational aims and objectives

The Foundation Degree in Industry 4.0 is designed to fulfil the following aims:

- To provide students with the knowledge and skills to help develop and lead digital transformation strategies in industry.
- To provide a programme of study that will equip individuals with the skills, knowledge and understanding appropriate for employment within companies that are undergoing digital transformation.
- To support and develop the knowledge pool of engineering practitioners in Industry 4.0 technologies and digital transformation by providing suitably skilled graduates.
- To highlight the importance of professional, moral, ethical, and legal issues specific to Industry 4.0 technologies and digital transformation.
- To provide industrial experience through project-based learning teaching strategies and the work-based learning module which will prepare students for employment.
- To develop the synergy between practical and theoretical aspects of digital transformation activities.
- To enable the students to develop their Meta skills – critical thinking, emotional intelligence, leadership, and entrepreneurship.
- To support the students in the development of interpersonal skills and to be able to take responsibility for their own professional development.
- To allow progression onto an Honours Degree in a related area.

2.2 Relationship to other programmes and awards

(Where the award is part of a hierarchy of awards/programmes, this section describes the articulation between them, opportunities for progression upon completion of the programme, and arrangements for bridging modules or induction)

SERC currently offers courses from Level 3 to Level 5 in various Engineering and Computing disciplines. It is expected that the student cohorts which currently enrol on the Level 3 programmes will be attracted by the opportunity to study locally for a university accredited Foundation Degree in Industry 4.0.

Upon completion, students will have the opportunity for progression on to OU BSc (Honours) programmes in either Cyber Security and Digital Forensics, or Cloud Computing Technologies through SERC.

Alternatively, students could opt to top up to a Level 6 BSc (Honours) Engineering programme through distance learning with OU.

2.3 For Foundation Degrees, please list where the 60-credit work-related learning takes place. For apprenticeships, an articulation of how the work based learning and academic content are organised with the award.
There will be a 40-credit work-based learning module in the Year 2, 2nd Semester of the programme for full time learners and Year 3, 2nd Semester for the part time learners on the course. Higher Level Apprenticeship students will carry out the work-based learning module in Year 3, 2nd semester as per the part time schedule and will conduct a project relating to their workplace. SERC integrates Project Based Learning for curriculum delivery where possible and this approach will be used for most modules of this programme. This means that students can develop transferable skills (Meta skills) whilst learning and being assessed using real world projects or problems.

2.4 List of all exit awards
Certification of Higher Education in Industry 4.0 – requires a minimum of 120 credits at Level 4. Foundation Degree in Industry 4.0 – requires 240 credits (a minimum of 120 credits must be at Level 5)

3. Programme structure and learning outcomes

(The structure for any part-time delivery should be presented separately in this section.)

Programme Structure - LEVEL 4 (Full time)					
Compulsory modules	**Credit points**	**Optional modules**	**Credit points**	**Is module compensatable?**	**Semester runs in**
Engineering and Computational Mathematics	20			Yes	1
Mechatronic Systems and Control	20			Yes	1
Programming Fundamentals	20			Yes	1
Industrial Internet of Things (IIOT)	20			Yes	2
Digital Manufacturing Infrastructure	20			Yes	2
Science for Modern Engineering Technicians	20			Yes	2

Programme Structure - LEVEL 4 (Part Time and HLA)					
Compulsory modules	**Credit points**	**Optional modules**	**Credit points**	**Is module compensatable?**	**Semester runs in**
Mechatronic Systems and Control	20			Yes	Y1 Sem 1
Programming Fundamentals	20			Yes	Y1 Sem 1
Engineering and Computational Mathematics	20			Yes	Y1 Sem 2
Industrial Internet of Things (IIOT)	20			Yes	Y1 Sem 2
Digital Manufacturing Infrastructure	20			Yes	Y2 Sem 1
Science for Modern Engineering Technicians	20			Yes	Y2 Sem 1

Intended learning outcomes at Level 4 are listed below:

Learning Outcomes – LEVEL 4	
3A. Knowledge and understanding	
Learning outcomes:	**Learning and teaching strategy/ assessment methods**
A1: Understand the fundamental principles, concepts and techniques that underpin solutions to engineering challenges. **A2:** Understand relevant engineering principles, analytical methods, modelling techniques, quantitative methods, and appropriate computer software to compare alternative solutions to clearly defined real-world problems. **A3:** Demonstrate a knowledge of key mathematical skills in computing and engineering, processing of information, formal methods, and statistical techniques to analyse data in the computing industry. **A4:** Understand the application of fundamental components and devices and emerging technologies and how they are used in an industrial setting.	**Learning and Teaching Methods:** Subject-related qualities are acquired mainly through lectures, tutorials, seminars, practical-based exercises, directed reading, videos, IT-based resources, case studies, virtual learning environment (VLE) integration and experiential learning. Tutorials promote reflective learning and the development of generic skills. Project based learning and work-based learning also provide vehicles for learning and teaching. Exploration, analysis, and evaluation of industry practice will enable learners to work on academic writing skills, make judgements and develop arguments pertaining to the cloud computing industry while expanding their knowledge and understanding at Level 4. This familiarity of terminology and context at Level 4 will form the basis of their knowledge and understanding for Level 5. **Assessment Methods:** Testing the knowledge base is principally through coursework, practical assessments, assignments, examinations, reports, class tests, group work, portfolios, journals, logs, and presentations. Assessment strategies offer students clear guidance regarding future development. Self-reflection constitutes an influential part of formative assessment. Summative assessment provides learners with clear and concise feedback to embed good practice in future knowledge

Learning Outcomes – LEVEL 4	
3A. Knowledge and understanding	
	acquisition. It also informs learners how to improve and expand their knowledge in continuing studies, particularly as they move from Level 4 to Level 5 and beyond.

3B. Cognitive skills	
Learning outcomes:	**Learning and teaching strategy/ assessment methods**
B1: Determine suitable approaches to straightforward engineering challenges using a basic knowledge and understanding of scientific and technological concepts, mathematical methods, and analytical techniques. **B2:** Make decisions and act on sources of information and data provided. **B3:** Apply and critically evaluate key computing and engineering concepts in a range of contexts. **B4:** Select and apply techniques and tools for abstracting, modelling, problem solving, and testing computing systems and engineering systems and their components and be aware of the limitations involved.	**Learning and Teaching Methods:** Learners are challenged to develop their cognitive skills by developing arguments and hypotheses based upon the scenarios they encounter. They will explore diverse topics and develop a critical analysis of their findings. Intellectual qualities are developed mainly through lectures, seminars, tutorials, assessments, practical's, experimental work, projects, and independent learning. Students will be presented with briefs (live where possible) that utilise Project-Based Learning, a student-centred pedagogy where students will learn through the experience of solving an industry-defined problem. This approach enables students to develop their meta skills and subject specific qualities. This will create contagious energy among students to develop a deeper understanding of the subject and quest for further knowledge and skills through active learning.

3B. Cognitive skills	
	At Level 4 students, will be introduced to fundamental practices across the industry that they will further build on and analyse at Level 5. **Assessment Methods:** Learners will be assessed on their ability to critique and evaluate their work. They will develop their knowledge using independent thinking skills and produce recommendations based upon and justified through supporting literature. The assessment focuses on the coursework, practical assessments, assignments, examinations, reports, class tests, group work, portfolios, journals, logs, and presentations. Some of these skills are assessed in formative and summative submissions. Assessment strategies offer students clear guidance concerning future development. Self-reflection and peer evaluation constitute an important part of formative assessment.

3C. Practical and professional skills	
Learning outcomes:	**Learning and teaching strategy/ assessment methods**
C1: Analyse, evaluate and/or test computing systems and/or engineering solutions, using appropriate simulation, and modelling tools where appropriate.	**Learning and Teaching Methods:** The learning and teaching methods place emphasis on lectures, practical and experimental work, and team projects. Project briefs simulating realistic practice also contribute to teaching and learning.

3C. Practical and professional skills	
C2: Plan and organise yourself and your work appropriately, including keeping systematic records of work in progress and outcomes. **C3:** Design, build and test the solution to a real-world engineering problem, using underpinning principles, concepts, and techniques.	Project briefs simulating realistic practice also provide students with opportunities to hone practical and professional skills and produce excellent outcomes. Working within allotted timeframes and resource constraints develops professional skills worthy of any workplace. Underpinning practical skills are developed throughout the Level 4 modules, providing students with the building blocks needed to acquire new techniques and practices as they progress through the year. At Level 4, the key practical skills will be designed to develop the technical capability needed by students to answer practical problems or briefs, taking responsibility to produce resolute outcomes. **Assessment Methods:** Learners will have the opportunity to use modern, industry-standard equipment to apply their knowledge and develop the skills required for employment. Testing the knowledge base is principally through coursework, practical assessments, assignments, examinations, reports, class tests, group work, portfolios, journals, logs, and presentations. Assessment of practical and professional skills is achieved through the practical elements of the level 4 modules. Formative feedback occurs throughout the learning and assessment process. Summative feedback is used to indicate the areas of strength, highlight areas for improvement to strengthen the knowledge, skills and abilities of learners.

3D. Key/transferable skills	
Learning outcomes:	**Learning and teaching strategy/ assessment methods**
D1: Work independently, planning, monitoring, reflecting on and improving your own learning. **D2:** Use appropriate digital tools demonstrating creativity and innovation to solve challenges. **D3:** Contribute to a positive working environment for the whole team. **D4:** Communicate information, arguments, ideas, and issues clearly and in appropriate ways, bearing in mind the audience and the purpose of your communication.	**Learning and Teaching Methods:** Transferable and fundamental skills are delivered throughout the course, i.e., lectures, coursework assignments. The teaching and learning of ICT skills will be within the course structure. Workshops include demonstrations such as ICT skills, PowerPoint and other I.T. applications, presentations, and library research skills. Effective learning environments are engendered in classroom and on-site industry visits and workshops with staff and students sharing experiences as partners in learning. Other learning and teaching methodologies include guest speakers, demonstration, and peer learning. The tutorial sessions will support learners with research, academic writing and referencing throughout the year. Teaching and learning will be contextualised with professional, social, ethical, and legal factors relevant to the cloud computing industry. Collaboration and communication techniques will be utilised through all learning and teaching activities, group discussions and simulations, project-based learning activities, report writing and blended and virtual learning platforms. Over the course of the programme, learners are provided with essential information which they must then research, analyse and interpret. Learners will undertake further independent reading to broaden the understanding of specific problems and design principles. This is designed to stretch and challenge learners and develop their ability at Level 4 as preparation for Level 5. Creative

3D. Key/transferable skills	
	thinking is engendered in every aspect of the programme and will be further fostered and encouraged through weekly learning. Discussion and critiques support the development of problem resolution at a higher intellectual level. **Assessment Methods:** Learners will develop subject knowledge from data examination and enhance their understanding of assessments. Throughout the programme learners will develop digital literacy by completing class activities and assessments using suitable methods. The testing of learner knowledge is principally through coursework, practical assessments, assignments, examinations, reports, class tests, group work, portfolios, journals, logs, and presentations. Assessment strategies offer students clear guidance regarding future development. Self-reflection and peer evaluation constitute an essential part of formative and summative assessment.

Certificate of Higher Education in Industry 4.0

Programme Structure - LEVEL 5 (Full Time)					
Compulsory modules	**Credit points**	**Optional modules**	**Credit points**	**Is module compensatable?**	**Semester runs in**
Computer Aided Engineering	20			Yes	1
Manufacturing Systems Management	20			Yes	1
Data Analytics and Artificial Intelligence	20			Yes	1
IIOT Data Security	20			Yes	2
Work Based Learning	40			No	2

Programme Structure - LEVEL 5 (Part Time and HLA)					
Compulsory modules	**Credit points**	**Optional modules**	**Credit points**	**Is module compensatable?**	**Semester runs in**
Computer Aided Engineering	20			Yes	Y2 Sem 2
Manufacturing Systems Management	20			Yes	Y2 Sem 2
Data Analytics and Artificial Intelligence	20			Yes	Y3 Sem 1
IIOT Data Security	20			Yes	Y3 Sem 1
Work Based Learning	40			No	Y3 Sem 2

Intended learning outcomes at Level 5 are listed below:

Learning Outcomes – LEVEL 5	
3A. Knowledge and understanding	
Learning outcomes:	**Learning and teaching strategy/ assessment methods**
A1: Apply relevant engineering principles, analytical methods, modelling techniques, quantitative methods, and appropriate computer software to formulate solutions to clearly defined real-world problems. **A2:** Be familiar with a range of models, analytical methods, and languages to support the understanding and analysis of computing and/or engineering systems. **A3:** Apply knowledge of engineering and manufacturing management principles, commercial context, and project management. **A4:** Demonstrate an awareness of major trends in manufacturing and engineering and of the implications of these trends.	**Learning and Teaching Methods:** Subject-related qualities are acquired through lectures, seminars, directed and self-directed reading, videos and IT-based resources, case studies, virtual learning environment (VLE) integration and experiential learning. Group critiques and individual tutorials promote reflective learning and the development of generic skills. Real world projects also provide vehicles for learning and teaching. At Level 5, the students will be encouraged to contextualise their work, research to expand and strive for improvement in their knowledge, understanding and application of the theoretical contexts and concepts encountered. Project based learning will challenge students to put their acquired knowledge into independent professional practice at Level 5, preparing students for the challenges of Level 6 or industry practice. **Assessment Methods:** Formative assessment is given continually through class work, practical labs, and tutorial sessions. Self-reflection and peer evaluation constitute an important part of formative assessment.

Learning Outcomes – LEVEL 5	
3A. Knowledge and understanding	
	Summative assessment is regularly provided through coursework, practical assessments, assignments, examinations, reports, class tests, group work, portfolios, journals, logs, and presentations. Assessment strategies offer students clear guidance regarding future development.

3B. Cognitive skills	
Learning outcomes:	**Learning and teaching strategy/ assessment methods**
B1: Apply a range of analytical and problem-solving tools and techniques to investigate problems, interpret data, draw conclusions, model, test and propose solutions in simulated and real-world situations. **B2:** Recognise the need for reliable and secure data for decision making and continuous improvement in the context of strategic and/or operational management in an industrial setting. **B3:** Explain how you propose to address (or have addressed) given engineering challenges in terms of the engineering principles on which your solutions are based.	**Learning and Teaching Methods:** These intellectual cognitive skills are developed through lectures, seminars, tutorials or practical-based activities, independent project work and project-based learning activities. As with Level 4, students will be presented with briefs however, at Level 5, project-based learning will move to a more complex problem, encouraging the students to develop their critical thinking, creativity, communication skills, and self-reflection. At Level 5, PBL will guide the students to develop more critical awareness, enabling students to formulate ideas and confidently research and experiment to strengthen their outcomes. **Assessment Methods:**

3B. Cognitive skills	
	Assessment strategies offer students clear guidance regarding future development. Formative assessment is given continually through class work, practical labs, and tutorial sessions. Self-reflection and peer evaluation constitute an important part of formative assessment. Summative assessment is regularly provided through coursework, practical assessments, assignments, examinations, reports, class tests, group work, portfolios, journals, logs, and presentations. Assessment strategies offer students clear guidance regarding future development. Where students solve real-life problems, cognitive skills are assessed via pitching and presenting ideas and client feedback on the outcomes produced.

3C. Practical and professional skills	
Learning outcomes:	**Learning and teaching strategy/ assessment methods**
C1: Plan specified engineering activities to take account of ethics, environmental risk and sustainability, and relevant legislative frameworks. **C2:** Use and develop digital skills to support self and others in using digital tools to collate, analyse, interpret, and present information effectively.	**Learning and Teaching Methods:** Practical and professional skills are developed through structured practical activities. These include practical activities, team projects and ideas generation and solution development workshops and project-based learning experiences. The course team will use guest speakers to enhance delivery and give real world context to the practical and professional skills developed on the programme. Learners will also utilise the work placement as an extension of the learning opportunity to

3C. Practical and professional skills	
C3: Demonstrate an ability to develop and design complex products (devices, artefacts, etc.), processes and systems to meet established requirements, that can include an awareness of non-technical – societal, health and safety, environmental, economic and industrial– considerations; to select and apply relevant design methodologies. **C4:** Analyse, evaluate and/or test engineering systems and/or solutions, using appropriate simulation and modelling tools where appropriate.	build upon skills fostered in Level 4 and will now be enhanced at Level 5. At Level 5, practical and professional skills are inherent in all modules, as learners are expected to deliver practical outcomes to a professional standard at this level. Learn to study and develop independent thinking, problem-solving, analysing, and evaluation and self-reflection skills. Collaborative group-based work will be assessed by work submitted individually and may include an element of assessment by tutor observation of each candidate's contribution to the team and effectiveness as a team member while the team is working on the project. Moving with confidence from fundamental technical skills to become flexible, adaptive, and experimental. Responding to real world briefs and work experience to successfully adapt to this ever evolving and creative industry by identifying and solving complex, challenging issues. **Assessment Methods:** Assessment strategies offer students clear guidance regarding future development. Formative assessment is given continually through class work, practical labs, and tutorial sessions. Self-reflection and peer evaluation constitute an important part of formative assessment. Summative assessment is regularly provided through coursework, practical assessments, assignments, examinations, reports, class tests,

3C. Practical and professional skills	
	group work, portfolios, journals, logs, and presentations. Assessment strategies offer students clear guidance regarding future development. At Level 5, learners must prove their professional practice in the Work-Based Learning module. To be successful, learners must display independence, make reasoned judgements in a professional setting. Learners will present outcomes of product design and development during a presentation to a panel of industry experts.

3D. Key/transferable skills	
Learning outcomes:	**Learning and teaching strategy/ assessment methods**
D1: Actively participate in a team activity which involves managing complex technical or professional tasks or projects, adapting plans as circumstances change. **D2:** Justify decisions based on research and feedback from others; takes accountability for decisions and be prepared to defend position taken. **D3:** Communicate information, arguments, ideas, and issues clearly in appropriate formats, using appropriate tools, bearing in mind the audience and the purpose of your communication. **D4:** Work independently, planning, monitoring, reflecting on and improving your own learning.	**Learning and Teaching Methods:** Key/transferable skills will be developed through lectures, seminars, and tutorials. This also includes ICT skills, information management, library research skills and preparation for placement activities. All transferable skills apply to theoretical disciplines, practical and project-based activities. Other learning and teaching methodologies include demonstration, and peer learning. Learners will be provided with key information which they will research, analyse, and interpret, then seek out further reading where they must independently broaden their understanding of specific problems and creative design principles. The fundamental design of the programme is to stretch learners, develop their skills at Level 5 as preparation for Level 6 or employment.

3D. Key/transferable skills	
	Project Based Learning and work-based learning module at Level 5 enable students to work in industry (or simulated) contexts driving them to become effective in their time management, taking responsibility for their work, and managing working with others in a professional environment. Creative thinking and critical analysis are applied to all aspects of the programme and will be further fostered and encouraged through weekly lessons. Discussion and critiques support the development of problem resolution at a higher intellectual level. At Level 5, students are encouraged to develop their self-reflection and set targets with the tutor, reflecting on feedback, and responding to this. **Assessment Methods:** Assessment strategies offer students clear guidance regarding future development. Formative assessment is given continually through class work, practical labs, and tutorial sessions. Self-reflection and peer evaluation constitute an important part of formative assessment. Summative assessment is regularly provided through coursework, practical assessments, assignments, examinations, reports, class tests, group work, portfolios, journals, logs, and presentations. Assessment strategies offer students clear guidance regarding future development.

Foundation Degree in Industry 4.0

4. Distinctive features of the programme structure

- **Where applicable, this section provides details on distinctive features such as:**
  - where in the structure above a professional/placement year fits in and how it may affect progression
  - any restrictions regarding the availability of elective modules
  - where in the programme structure students must make a choice of pathway/route
- **Additional considerations for apprenticeships:**
  - how the delivery of the academic award fits in with the wider apprenticeship
  - the integration of the 'on the job' and 'off the job' training
  - how the academic award fits within the assessment of the apprenticeship

The modes of delivery for the course are full-time (2 academic years, 4 semesters) and part-time (3 academic years, 6 semesters). The course is based on 120 credits of study per year full-time (2 semesters), and 80 credits per year part-time (2 semesters). Modules at level 5 build on the knowledge and skills students learn and develop at Level 4.

The division of time, between lectures, practical activity, and independent study, within a module can vary. For each module, apart from the Work Based Learning module, students are expected to spend typically 200 hours of study in total.

Integral to this Foundation Degree is Work Based Learning. Cognisance of this has been taken in the design of the Foundation Degree programme by including a Work Based Learning module. This module is completed through an industrial placement which affords students the opportunity to gain invaluable experience of an engineering/manufacturing working environment. Placements are four days per week equating to 308 placement hours with an additional 12 hours of tutorials and 80 hours of independent study. The module has a value of 40 credit points at Level 5.

In addition to providing students with experience of industrial working practices, this module also provides an opportunity to relate and integrate these skills with the academic content of their course. Each student completes a report detailing the learning achieved during the placement and its relevance to future employment and makes a formal presentation of this to the course team.

Full-time students take the Work Based Learning module in Semester 2 of Year 2, while part-time students take this module in Semester 2 of Year 3. When agreeing the work placement, the placement organisation will nominate an industrial supervisor and a member of the course team will act as placement tutor to the student. A mechanism, (the College Business Engagement and Student Tracking (BEST) system outlined below), will be put in place to allow the student and the industrial supervisor to have effective communication with the placement tutor, who will also make at least two visits over the placement period.
Through the tutorial system at Level 4, students are introduced to the concept of work placement and at this point are guided to actively seek a suitable work placement. As a result, it is normal that students find a placement in their own locality. Where a student

is unable to find a suitable placement, the placement tutor will provide options from a bank of employers in the local area. Details of these are available to students on the BEST system. All placements must be formally confirmed by the host organisation prior to commencement of the Work Based Learning module. An on-going consultation process will occur with the student in tutorials to ensure a suitable placement has been selected.

No elective modules or pathway/routes are available from this programme.

Programme Resources

SERC continues to invest heavily in resources for computing and engineering programmes. This is both in terms of physical resources and staff skillsets. The college has dedicated teaching facilities and resources on each campus and in recent academic years the School of Computing & Engineering has invested over £1,000,000 in a range of state-of-the-art technologies that include:

Engineering:

- Dedicated specialist rooms on each campus
- Industry standard CAD/CAM software i.e., Solidworks and MasterCAM
- 5 axis CNC machining capabilities
- CNC Laser Cutting
- Conventional machining workshops – Turning and milling etc
- Fabrication and welding workshops – Welding, CNC plasma, sheet and plate forming equipment.
- Augmented reality welding
- CNC Coordinate Measuring and Inspection System
- Faro arm CMM scanning
- 3D printers spanning Fused Deposition Modelling and Polyjet processes.
- Electronics labs on each of the main campuses that facilitate PCB design and manufacture.
- Surface mounted circuit production system
- Substantial range of Arduino, ESP and Raspberry PI devices.
- Mechatronic and automation lab on each campus covering pneumatics, hydraulics and PLC control.
- FESTO Industry 4.0 production system.
- ABB 6 axis robots on each campus.
- Materials testing and mechanical experiment equipment on each campus e.g. Instron tensile testing machines, toughness testing, hardness testing. Wide range of physics type experiments.

Computing:

- Dedicated specialist rooms
- Dedicated on-premises School of Computing server infrastructure
- Dedicated remote access and application server
- Range of virtual, augmented, and virtual reality equipment (Oculus, Acer, HoloLens)
- Industry standard Cisco networking laboratory configuration
- iMac Pro facilities to support cross platform application development

- Internet of Things – extensive range of components combined with an Industry 4.0 technology suite
- Extensive range of components to facilitate system builds and computer systems architecture projects
- Portable motion capture suite
- Access to a range of cloud platforms (AWS, Azure)
- Interactive whiteboards within teaching environments
- Dedicated tablet devices (mobile application deployment and testing)

Please note specialist computing rooms are in addition to general teaching rooms.

Curriculum technology needs are under constant review to ensure that they are in line with industry practices and can accommodate any emerging trends. There is provision within the school budget allocation for the procurement of resources and in addition business cases can be submitted to secure the capital funds for the acquisition of resources from a resource or estates perspective.

Exemplar Room/Lab Specification

The College has excellent estates facilities with all campuses either being built or extensively renovated recently. This is mirrored by the facilities provided at a classroom level with a typical room specification containing:

- 25 Student PCs per room
    - Dell Precision 3440 (Intel® Core i7, 32 GB RAM, AMD Radeon Pro 3200 Series)
- Interactive whiteboard
- Projectors
- Remote access facilities to all requisite software, on premise server resources and cloud-based resources

Device Loan Scheme

The college implements a device loan scheme. This scheme is to support learners who do not have access to the requisite technology to learn from home. All devices are configured to facilitate secure connection to all college platforms including the dedicated computing server infrastructure and cloud-based systems. In addition, the School of Computing & Engineering implements a system where learners can loan specialist hardware such as IoT kits, Arduino kits and AR/VR systems.

5. Support for students and their learning.
(For apprenticeships this should include details of how student learning is supported in the work place)

Students and their learning are supported in a number of ways:

· A comprehensive programme induction for new students.

· Student programme and module handbooks are placed on the VLE (MOODLE) for students to reference at any time from any location.

· An HE Student Handbook for the academic year is available on the college website and VLE highlighting internal processes, codes of conduct, academic practices, support services and general college information for the learner.

· Assignment of students to a studies advisor and a year tutor.

· In order to support students with the transition from studying at Level 3 or A Level to Level 4, a number of study skills lessons are built into tutorial slots. This will include academic reading, using the library services and accessing journals, research skills, academic writing and Harvard referencing.

· The Learning Academy also offer a "Getting Grips with HE" series early every academic year which will cover the same skills as mentioned above. The college Learning Resource Centre also offer sessions for HE classes to demonstrate how to access subject specific academic material.

· Access for students to the Course Director and academic staff through an 'office hours' system (either in person or via MS Teams).

· Student representation on course committees and HE Review Boards.

· Opportunity to address general concerns through the student/staff consultative committee.

· Facilities and assistance offered by the library and computer services. Library material used for computing and engineering programmes are mainly eBooks and electronic journals which can be accessed online on and off-campus.

· Student e-mail accounts and full access to the College VLE (MOODLE).

· The Student Support Hub provide help in the field of customer service, young career support, health, counselling and guidance, careers, finance, learning support, pastoral care, library and resource centre and Students Union.

· Dedicated Work Placement department providing advice and support through the complete process for securing and undertaking Work Based Learning.

· Provision of Dedicated Work Based Learning tutor.

· The College has procedures for assessment of, and planning to meet the additional support needs of students with disabilities. These procedures follow DSA guidance.

· Timetabled tutorial sessions on a weekly basis will be provided for all students.

· College email system accessible for student to contact tutors for support and advice in and out of office hours.

· College Microsoft Teams system accessible for students to contact tutors for support and advice whilst working remotely.

· The colleges operations a robust complaints and appeals process that the students can avail of as required.

· Several school technicians are available to support student with their learning and in particular, projects.

6. Criteria for admission
(For apprenticeships this should include details of how the criteria will be used with employers who will be recruiting apprentices.)

Admission Criteria

Applicants must satisfy the College general entry requirements as set out in the prospectus. Alternatively, applicants may demonstrate their ability to undertake the course through the accreditation of prior experiential learning (APEL). The initial offer standard may vary from year to year.

Proposed 2022/23 Entry Criteria - Foundation Degree Year 1 (full-time)

GCSEs

Four GCSEs including:

- A minimum of Grade C in English OR Essential Skills Level 2 OR another approved equivalent
- A minimum of Grade C in Maths OR Essential Skills Level 2 OR another approved equivalent
- Two additional GCSEs at Grade C are required OR approved equivalents. One of the two must be from a STEM (Science, Technology, Engineering, Maths) or computing subject area.

UCAS

A minimum of 64 UCAS points including:

- Level 3 Diploma OR
- A levels

Access Diploma

- Access to Higher Education Diploma with an overall average of 45+%

Admissions

- Successful completion of the Admissions Process

APEL

Applicants who do not hold any formal Level 3/4 qualifications but hold significant and relevant Industrial experience may gain admission through experiential learning and should request the college Accreditation of Prior Experiential Learning (APEL) procedure.

English Language Requirements for International students:

- Common European Framework of Reference (CEFR) level
- B2 IELTS 6.0 (minimum of 5.5 in all skills)
- PTE 51 Or an approved equivalent test in English

Tier 4 Students:

- SERC will only accept a Secure English Language Test (SELT) for issuing a Certificate of Acceptance for Studies (CAS)

Proposed 2022/23 Entry Criteria - Foundation Degree Year 1 (part-time)

GCSEs

Four GCSEs including:

- A minimum of Grade C in English OR Essential Skills Level 2 OR another approved equivalent
- A minimum of Grade C in Maths OR Essential Skills Level 2 OR another approved equivalent
- Two additional GCSEs at Grade C are required OR approved equivalents. One of the two must be from a STEM (Science, Technology, Engineering, Maths) or computing subject area.

UCAS

A minimum of 54 UCAS points including:

- Level 3 Diploma OR
- A levels

Access Diploma

- Access to Higher Education Diploma with an overall average of 40+%

Admissions

- Successful completion of the Admissions Process

APEL

Applicants who do not hold any formal Level 3/4 qualifications but hold significant and relevant Industrial experience may gain admission through experiential learning and should request the college Accreditation of Prior Experiential Learning (APEL) procedure.

English Language Requirements for International students:

- Common European Framework of Reference (CEFR) level
- B2 IELTS 6.0 (minimum of 5.5 in all skills)
- PTE 51 Or an approved equivalent test in English

Tier 4 Students:

- SERC will only accept a Secure English Language Test (SELT) for issuing a Certificate of Acceptance for Studies (CAS)

7. Language of study

The programme will be offered in English.

English Language Requirements for International students:

- Common European Framework of Reference (CEFR) level
- B2 IELTS 6.0 (minimum of 5.5 in all skills)
- PTE 51 Or an approved equivalent test in English

Tier 4 Students:

- SERC will only accept a Secure English Language Test (SELT) for issuing a Certificate of Acceptance for Studies (CAS)

8. Information about non-OU standard assessment regulations (including PSRB requirements)

None

9. For apprenticeships in England End Point Assessment (EPA).

(Summary of the approved assessment plan and how the academic award fits within this and the EPA)

N/A

10. Methods for evaluating and improving the quality and standards of teaching and learning.

In line with QAA Foundation Degree Characteristics Statement (2020) the following processes are in place:

• Cross marking, internal moderation and external examining processes used to ensure validity and reliability of assessment process.

• The Course Committee considers student feedback from each module.

• Student/staff consultative meetings provide the means of highlighting any difficulties, relating to the course, experienced by the cohort.

• Annual Course Review procedures consider quantitative and qualitative feedback from each course within a subject area.

• Students are given the opportunity to be represented at staff / student consultation meetings. • Staff teaching performance is monitored annually • Staff appraisal is carried out on a two-year cycle with attention given to the development needs of the individual staff member. • The college annually complete a Self-Evaluation and Quality Improvement Plan for each programme following the Awarding Organisations requirements. • The College has a Staff Development Programme, which facilitates specific training/development for staff. • All staff are encouraged to complete Information & Learning Technology qualifications. • Views of External Examiners are considered as part of the quality processes and Awarding Organisations reporting mechanisms are followed. • Informal views and formal written feedback are considered from Employers. • Student performance data and career progression is annually monitored. • The Course Director attends annual meetings and workshops as provided by either the Awarding Organisation or Validated Institute. This also helps to regulate codes of practice and course management procedures.

10. Changes made to the programme since last (re)validation
N/A

Annexe 1: Curriculum map

Annexe 2: Notes on completing the OU programme specification template

Annexe 1 - Curriculum map

This table indicates which study units assume responsibility for delivering (shaded) and assessing (✓) particular programme learning outcomes.

Level	Study module/unit	Programme outcomes													
		A1	A2	A3	A4	B1	B2	B3	B4	C1	C2	C3	D1	D2	D3
4	Engineering and Computational Mathematics	✓		✓		✓							✓		✓
	Mechatronic Systems and Control				✓		✓		✓	✓		✓	✓		
	Programming Fundamentals				✓	✓		✓	✓	✓	✓			✓	✓
	Industrial Internet of Things (IIOT)		✓			✓						✓		✓	
	Digital Manufacturing Infrastructure				✓			✓		✓			✓		
	Science for Modern Engineering Technicians	✓	✓	✓		✓	✓			✓	✓		✓		

Level	Study module/unit	Programme outcomes												
		A1	A2	A3	B1	B2	B3	C1	C2	C3	D1	D2	D3	D4
5	Computer Aided Engineering	✓			✓				✓	✓				✓
	Manufacturing Systems Management		✓	✓		✓		✓			✓	✓	✓	
	Data Analytics and Artificial Intelligence	✓				✓	✓		✓	✓			✓	✓
	IIOT Data Security			✓	✓	✓		✓	✓		✓	✓		
	Work Based Learning		✓	✓	✓		✓					✓		✓

Annexe 2: Notes on completing programme specification templates

1 **-** This programme specification should be mapped against the learning outcomes detailed in module specifications.

2 – The expectations regarding student achievement and attributes described by the learning outcome in section 3 must be appropriate to the level of the award within the **QAA frameworks for HE qualifications**: http://www.qaa.ac.uk/AssuringStandardsAndQuality/Pages/default.aspx

3 – Learning outcomes must also reflect the detailed statements of graduate attributes set out in **QAA subject benchmark statements** that are relevant to the programme/award: http://www.qaa.ac.uk/AssuringStandardsAndQuality/subject-guidance/Pages/Subject-benchmark-statements.aspx

4 – In section 3, the learning and teaching methods deployed should enable the achievement of the full range of intended learning outcomes. Similarly, the choice of assessment methods in section 3 should enable students to demonstrate the achievement of related learning outcomes. Overall, assessment should cover the full range of learning outcomes.

5 - Where the programme contains validated **exit awards** (e.g. CertHE, DipHE, PGDip), learning outcomes must be clearly specified for each award.

6 - For programmes with distinctive study **routes or pathways** the specific rationale and learning outcomes for each route must be provided.

7 – Validated programmes delivered in **languages other than English** must have programme specifications both in English and the language of delivery.