BEng (Hons) Mechatronics & Robotics Engineering; BEng (Hons) Mechatronics and Robotics Engineering with Foundation Year

Programme Specification

1.	**Programme title**	BEng (Hons) Mechatronics & Robotics Engineering BEng (Hons) Mechatronics & Robotics Engineering with Foundation Year
2.	**Awarding institution**	Middlesex University
3a	**Teaching institution**	Middlesex University (London)
3b	**Language of study**	English
4a	**Valid intake dates**	September
4b	**Mode of study**	FT/PT/TKSW
4c	**Delivery method**	☒ On-campus/Blended ☐ Distance Education
5.	**Professional/Statutory/Regulatory body**	Institution of Engineering Designers (IED)
6.	**Apprenticeship Standard**	N/A
7.	**Final qualification(s) available**	BEng (Hons) Mechatronics & Robotics Engineering BEng (Hons) Mechatronics & Robotics Engineering with FY BEng Mechatronics & Robotics Engineering DipHE Mechatronics & Robotics Engineering CertHE Mechatronics & Robotics Engineering
8.	**Academic year effective from**	**2024/25**

9. Criteria for admission to the programme
Admission to the BEng (Hons) Mechatronics & Robotics Engineering programme will require 112 UCAS points including 80 points from at least two science or numerate based subjects and GCSE English and Maths at grade 4 or above.

In addition, Middlesex University's general entry requirements apply as outlined in the university's regulation B2. Applicants whose first language is not English are required to achieve 6.0 in IELTS overall (with a minimum of 5.5 in each component) or an equivalent qualification recognised by Middlesex University. The equivalence of qualifications from outside UK will be determined according to NARIC guidelines.

We welcome applicants with a wide variety of educational experience including: A/AS levels, AVCE, BTEC National Diploma, Access Certificates, Scottish Highers, Irish Leaving Certificates (Higher Level), International Baccalaureate and a large number of equivalent home and overseas qualifications. Application from mature applicants with suitable life skills and experiences are also welcomed. Recognition of Prior Learning (RPL) is permitted.

Please refer to the programme specification for the Foundation Year for criteria for admission to the BEng (Hons) Mechatronics & Robotics Engineering with Foundation Year programme – Foundation Year in Computing and Engineering.

10. Aims of the programme

The programme aims to achieve the following objectives:

- **Foster Technical Proficiency**: The programme endeavours to equip students with a deep understanding of Artificial Intelligence (AI), automation systems as well as mechatronics for real-time systems. Through active involvement in formulating, modelling and prototyping, students are empowered to tackle challenges and seize opportunities within diverse practical projects.
- **Encourage Innovation and Creativity**: Students will be motivated to explore technological frontiers, fostering innovation, creativity and critical thinking in the realm of mechatronics and robotics.
- **Integrate Ethical and Societal Perspectives**: The programme aims to develop engineers who are mindful of ethical, societal and sustainability considerations in their engineering solutions. This alignment with global challenges and the UN Sustainable Development Goals is emphasised.
- **Establish a Solid Foundation**: A comprehensive groundwork in physical computing, programming for engineering applications, electronics principles and the practical application of mathematics will be provided. This foundation will empower students to effectively model and solve complex engineering problems.
- **Specialise in Key Areas**: The programme offers specialised knowledge and skills in areas such as mechatronics, robotics, sensors, actuators, control and Artificial Intelligence (AI) in robotics. Emphasis is placed on sustainability and real-world applications.
- **Provide Hands-On Experience**: Extensive hands-on experience will be facilitated through practical workshops, laboratory sessions and projects. These activities will simulate industry practices and leverage partnerships with leading industry entities like Siemens, Festo and National Instruments.
- **Achieve Professional Accreditation**: The programme is structured to prepare students to meet the academic requirements for partial Chartered Engineer (CEng)

status recognised by the Institution of Engineering Designers (IED). This facilitates further professional development and recognition.

- **Prepare for Diverse Career Opportunities**: Graduates will be equipped for successful careers in a diverse career pathway, spanning mechatronics and robotics engineering, as well as wider engineering related fields, such as design engineering, mechanical systems engineering and automation engineering. They will be poised to contribute to technological advancement and address critical societal needs.

11. Programme outcomes*

A. Knowledge and understanding	**Teaching/learning methods**
On completion of this programme the successful student will have knowledge and understanding of how to: 1. Apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Some of the knowledge will be at the forefront of the particular subject of study (AHEP4 C1) 2. Analyse complex problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles (AHEP4 C2) 3. Select and evaluate technical literature and other sources of information to address complex problems (AHEP4 C4) 4. Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts (AHEP4 C7) 5. Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct (AHEP4 C8) 6. Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion (AHEP4 C11)	Students gain knowledge and understanding through a dynamic mix of teaching, learning and assessment strategies, designed to actively engage them and enhance their comprehension. The educational context is enriched with staff-led interactive sessions, which delve into theoretical concepts in a multi-disciplinary context. These engaging sessions are complemented by hands-on laboratory activities, crucial for reinforcing theoretical knowledge through practice-led experiments and simulations, allowing students to apply their learning in tangible scenarios. To broaden their understanding, students participate in a variety of interactive activities including seminars, group tutorials and collaborative exercises. These are crafted to foster critical thinking, problem-solving and the application of theory to practical, real-life societal challenges, with a particular focus on sustainable development and the UN Sustainable Development Goals (SDGs). Additionally, students undertake individual and group projects, encouraging research-informed exploration and synthesis of information, thereby deepening their subject mastery. Guided and independent study is highly promoted, complementing formal instruction. This self-directed exploration is supported by comprehensive resources such as key concept videos provided in advance, enhancing digital learning and offering opportunities for students to deepen their understanding, explore topics more extensively and adopt a global perspective.

7. Discuss the role of quality management systems and continuous improvement in the context of complex problems (AHEP4 C14) 8. Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights (AHEP4 C15) 9. Plan and record self-learning and development as the foundation for lifelong learning/CPD (AHEP4 C18)	Academic advising plays a crucial role in this holistic educational approach, guiding students through their academic journey, fostering an inclusive learning environment, and highlighting opportunities for work-based learning and engagement with industry. This approach ensures that students not only gain a deep understanding of their subject but also remain well-being-focused, ready to apply their knowledge in a global context and prepared for success in both academic and professional endeavours. **Assessment methods** Students' knowledge and understanding is assessed by means of a wide variety of assessment techniques, each carefully chosen to align with the specific objectives of our curriculum and to cater to the diverse learning styles of our student body. This includes a variety of interactive assignments such as presentations, formal report writing and structured dialogues in the form of portfolios. These tasks not only assess students' understanding and ability to communicate complex ideas but also foster critical thinking and collaborative learning. Incorporating authentic assessment strategies, students engage in practical activities, problem-solving tasks and project work that reflect real-world scenarios and industry standards. These exercises are instrumental in enabling students to confront actual problems, apply systematic problem-solving approaches and harness innovative thinking. Practical laboratory tasks provide a platform for students to engage in scientific inquiry, applying theoretical knowledge to experimental setups and interpreting data to draw meaningful conclusions. A key component of our assessment approach is the provision of continual formative feedback, including discursive feedback that supports students' learning journeys. This varied feedback mechanism

	ensures students are continuously guided and supported in their learning, enhancing the authenticity and effectiveness of the assessment process.
B. Skills On completion of this programme the successful student will be able to: 1. Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed (AHEP4 C3) 2. Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards (AHEP4 C5) 3. Apply an integrated or systems approach to the solution of complex problems (AHEP4 C6) 4. Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity (AHEP4 C9) 5. Adopt a holistic and proportionate approach to the mitigation of security risks (AHEP4 C10) 6. Use practical laboratory and workshop skills to investigate complex problems (AHEP4 C12) 7. Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations (AHEP4 C13) 8. Function effectively as an individual, and as a member or leader of a team (AHEP4 C16)	**Teaching/learning methods** Students develop their skills within a stimulating and diverse teaching and learning framework, designed to nurture practical abilities, critical thinking and teamwork. This dynamic setting encourages the acquisition of vital professional competencies through a blend of interactive sessions, guided learning and academic advising. Central to our approach are practice-led workshops that integrate multidisciplinary learning, encompassing engaging discussions, group tutorials, and hands-on laboratory work. These sessions offer an immersive experience, allowing students to apply theoretical concepts in real-world contexts, thereby enhancing their technical and analytical skills. Seminars and laboratory exercises immerse students in experiential learning, emphasising the application of knowledge to practical challenges and encouraging collaboration. This environment promotes active engagement and peer learning, deepening students' understanding of complex issues and fostering inclusive approaches to problem-solving. Projects, undertaken both individually and in groups, are key to our pedagogy. They provide a platform for students to engage with comprehensive tasks that mirror industry problems, demanding creativity, critical evaluation and strategic thinking. These projects often incorporate global and employer perspectives, highlighting the relevance of sustainable development and the application of research-informed strategies. Utilising state-of-the-art simulation tools and engaging in testing activities, students gain insights into the practical aspects of their

9. Communicate effectively on complex engineering matters with technical and non-technical audiences (AHEP4 C17)	field, from conceptual design to tangible outcomes, preparing them for industry-specific tasks and decision-making. With the aid of key concept videos provided in advance and a strong emphasis on digital learning, we offer a well-rounded educational experience. This approach not only ensures the acquisition of theoretical knowledge but also emphasises the development of practical skills and competencies essential for success in the global marketplace. Through work-based learning opportunities and industry engagement, we prepare students for the realities of their future careers, all while maintaining a focus on health and well-being. **Assessment methods** Students' skills are assessed by employing a diverse array of practical and analytical methods tailored to measure their proficiency and application of learned competencies. To enhance communication skills, students are tasked with presenting technical material and expressing their insights through structured reports and project documentation. This practice not only refines their ability to present intricate data in a clear and succinct manner but also equips them for the demands of professional communication, including report writing and presentations. The inclusion of authentic assessment tasks in the form of practical assignments and project work compels students to employ their skills in realistic situations. This approach ensures they are adept at converting theoretical understanding into actionable, real-world solutions. A cornerstone of our assessment strategy is the provision of continual formative feedback, including discursive feedback, which plays a pivotal role in students' ongoing learning and development. This varied feedback mechanism supports a reflective learning process, enabling

	students to iteratively improve their skills and understanding throughout their educational journey.

12. Programme structure (levels, modules, credits and progression requirements)

12.1 Structure of the programme

Please refer to the programme specification for the Foundation Year for the modules to be taken during the foundation year of the BEng (Hons) Mechatronics & Robotics Engineering with Foundation Year programme – Foundation Year in Computing and Engineering

The BEng (Hons) Mechatronics & Robotics Engineering programme can be taken in three modes: (a) full-time, (b) part-time and (c) thick-sandwich mode (TKSW). In full-time mode, the programme will take three years to complete; in part-time mode, the programme will take a minimum of six years to complete; and in TKSW mode, the programme will take a minimum of four years to complete. The programme is structured into three academic levels (Level 4, Level 5 and Level 6).

Each taught module is worth 30 credits and the students need to gain 120 credits to progress to the next level. In TKSW mode the students will spend a year on a placement module after having completed the first two academic levels, and then resume their studies by taking the specified level 6 modules. Even though the placement module is credit-rated (worth 120 credits) it does not affect the number of credits needed by the students to gain their honours degree award. However, it leads to a certificate of industrial studies in its own right indicating the credits gained.

All modules in the BEng (Hons) Mechatronics & Robotics Engineering programme are compulsory and students need 360 credits to graduate with honours. If on completion of their studies, the students fail to obtain the 360 credits required by the BEng programme, they may be eligible for graduating with non-honours, i.e. an ordinary degree, if they have obtained 300 credits, of which at least 60 credits are at Level 5 and at least 60 credits are at Level 6.

The structure of the full-time/TKSW mode is given below:

Year 1		
Sem. 1	**PDE1821** Practical Applications of Mathematics for Engineers [30]	**PDE1822** Electronic Engineering Principles and Applications [30]
Sem. 2	**PDE1823** Physical Computing and Programming [30]	**PDE1824** Engineering Projects [30]
Year 2		

Sem. 1	**PDE2823** Robotics [30]	**PDE2822** Sensors, Actuators and Control [30]
Sem. 2	**PDE2317** Design & Engineering in Context [30]	**PDE2821** Mechatronics [30]
Year 3	**PDE3250** - Industrial Placement (compulsory for TKSW only) [120]	
Year 3/4		
Sem. 1	**PDE3802** Artificial Intelligence (AI) in Robotics [30]	**PDE3822** Mechatronic Systems and Industry 4.0 [30]
Sem. 2	**PDE3823** Major Project and Professional Practice [60]	

The structure of the part-time mode is given below:

Year 1	
Sem. 1	**PDE1821** Practical Applications of Mathematics for Engineers [30]
Sem. 2	**PDE1823** Physical Computing and Programming [30]
Year 2	
Sem. 1	**PDE1822** Electronic Engineering Principles and Applications [30]
Sem. 2	**PDE1824** Engineering Projects [30]
Year 3	
Sem. 1	**PDE2823** Robotics [30]
Sem. 2	**PDE2821** Mechatronics [30]

Year 4		
Sem. 1	**PDE2822** Sensors, Actuators and Control [30]	
Sem. 2	**PDE2317** Design & Engineering in Context [30]	
Year 5		
Sem. 1	**PDE3802** Artificial Intelligence (AI) in Robotics [30]	**PDE3822** Mechatronic Systems and Industry 4.0 [30]
Year 6		
Sem. 2	**PDE3823** Major Project and Professional Practice [60]	

12.2 Levels and modules

Level 4

Compulsory	Optional	Progression requirements
Students must take all of the following: **PDE1821** Practical Applications of Mathematics for Engineers [30] **PDE1822** Electronic Engineering Principles and Applications [30] **PDE1823** Physical Computing and Programming [30] **PDE1824** Engineering Projects [30]	There are no optional modules.	Full-time/Part-time mode: To progress onto level 5, students must pass all level-4 modules.

Level 5

Compulsory	Optional	Progression requirements

Students must take all of the following: **PDE2821** Mechatronics [30] **PDE2822** Sensors, Actuators and Control [30] **PDE2317** Design & Engineering in Context [30] **PDE2823** Robotics [30]	There are no optional modules.	TKSW -To progress on to a placement year students must pass all modules. Full-time/Part-time mode: To progress onto level 6, students must pass all level-5 modules.

Level 6 (TKSW mode only)		
Compulsory	**Optional**	**Progression requirements**
TKSW Students must take all of the following: **PDE3250** Industrial Placement [120]	N/A	N/A

Level 6		
Compulsory	**Optional**	**Progression requirements**
Students must take all of the following: **PDE3802** Artificial Intelligence (AI) in Robotics [30] **PDE3822** Mechatronic Systems and Industry 4.0 [30] **PDE3823** Major Project and Professional Practice [60]	There are no optional modules.	To graduate with an honour degree, i.e. with a BEng (Hons) Mechatronics & Robotics Engineering award, students must have achieved 360 credits, or to graduate with an ordinary degree, 300 credits with a minimum of 60 credits at Level 6.

12.3 Non-compensatable modules

Module level	Module code
Level 6	PDE3823 Major Project and Professional Practice

13. Information about assessment regulations

This programme will run in line with general University Regulations:

https://www.mdx.ac.uk/about-us/policies

All modules will require that you complete an amount of coursework as part of your assessment. Coursework can include written work, such as essays, exercises, laboratory logbooks, projects, dissertations, portfolios of written work etc., however, it can also include non-written work such as demonstrations, presentations, viva, etc.
Level 4 modules, which do not contribute to the final classification, are awarded a Y grade (ungraded pass).

To pass a module, the overall module grade should be a minimum of 40% (with a minimum of 35% in each component). Due to professional body requirements, module compensation can only be granted for overall module marks of a minimum of 35%.

For additional assessment information and how learning outcomes are assessed please refer to the individual module narratives for this programme.

14. Placement opportunities, requirements and support (if applicable)

Students on the TKSW mode take a placement (36 to 48 weeks) at the end of year 2. A dedicated Employability Advisor from MDXworks Careers and Employability Service helps in the search for an appropriate employer and provides students with appropriate Placement. They also provide students with appropriate guidance and support in preparation for, during and after placement. The placement forms the basis for an assessed report based on the organisation. At the start of the placement, students are allocated an individual supervisor who provides support and advice for the duration of the project.

Students following a TKSW placement year are supported through the process of securing a placement, which includes the legal and QAA requirements for placement learning, via tutorial support and the MDXworks Careers and Employability Service.

Students who complete the placement on TKSW mode will receive an additional qualification referred to as a Diploma of Industrial Studies.

15. Future careers / progression

As a BEng (Hons) Mechatronics & Robotics Engineering graduate, you will have excellent career prospects; the range of potential employers will be vast across the private, public and not-for-profit sectors. The programme offers students a diverse career pathway, spanning mechatronics and robotics engineering, as well as wider engineering-related fields, such as design engineering, mechanical systems engineering and automation engineering. The graduates will have excellent career prospects. Some have gone on to work at Titan Motorsport, Ashridge Engineering, Tevva eTrucks, etc., or have started their own business in automation. Some of the job titles are Automation Engineer, System Integration Engineer, Robotics Engineer, and Design & Development Engineer. Some graduates have also chosen to continue further studies where this degree will provide a strong foundation such as Engineering Management, Mechatronic Systems Engineering or Robotics.

The programme is accredited by the Institution of Engineering Designers (IED), partially meeting their academic standards for Chartered Engineer (CEng) status. Graduates can pursue CEng status with further study at level 7 and relevant engineering experience.

MDXworks Careers and Employability Service will provide continued support to students after graduation with employability and to final-year students looking for graduate jobs/employment.

Students will be encouraged to participate in national competitions such as WorldSkills UK competitions in Automation, Industrial Robotics and Mechatronics, enriching their experience and strengthening their profile. All Year-1 students will enter the annual IMechE Design Challenge as part of their programme. Our specialised facilities housed in the Ritterman and Hatchcroft Buildings are supplied with industry-standard equipment spanning mechatronics, robotics, electronics and networking solutions. Students will further enhance their problem-solving skills by working in workshops in teams as well as individually, learning key skills such as prototyping and understanding materials and associated processes. They will also learn how to specify the correct components to meet a specification while working within realistic commercial, economic and legislative constraints. Essential software required for the course, such as STEP-7, NX, LabVIEW, MATLAB, and SolidWorks, is readily available.

Upon completion of the programme, students will specialise in the area of automation, knowing how to model, simulate, design and program a wide range of mechatronics and robotic systems along with industry-specific software architectures essential for complex industrial systems. Moreover, the students will possess practical skills and knowledge vital for mechatronics and robotics engineering, including system engineering and sensory processing development for autonomous robotic or mechatronic systems.

16. Particular support for learning

The Faculty's Teaching and Learning approach is used across the programme to promote autonomy and practice-based learning which are in line with the University's general strategy.

In support of the student's learning experience:

- All new students go through an induction programme and some have early diagnostic numeric and literacy testing before starting their programme. Library and Student Support (LSS) provides workshops for those students needing additional support in these areas.
- Students are allocated a personal email account and secure online storage.
- New and existing students are given module handbooks for each module they study. Copies of all module handbooks can be found on MyLearning, a web-based online learning platform where learning materials are provided to further support learning.
- Additionally, each student will receive a free core e-book for each module they study.
- Extensive library facilities are available on all campuses. MyUniHub pages are available as learning resources.
- Students can access advice and support on a wide range of issues from the UniHelp Student Information Desk.
- Placements are supported by MDXworks Careers and Employability Services and Faculty academics; please refer to section 14 of this programme specification.

- The MDXworks Careers and Employability Services run a series of timetabled sessions looking at employability skills such as developing a professional LinkedIn profile. Students are also encouraged to engage in their drop-in sessions to support CV development etc.
- High-quality specialist network, software, digital and wireless laboratories equipped with industry-standard software, hardware and tools as appropriate, for practice-based teaching as well as self-study. Middlesex University is a Cisco Local Academy and Arm, Opnet and Xilinx University partners, Huawei approved 5G training centre, LABVIEW Academy.
- Teaching staff are available for each subject offering personal academic advice and help if needed. Staff availability for this purpose is posted outside staff office doors.
- Students are also allocated Academic Advisors for support and guidance throughout the entire duration of the Programme.
- Productive and informed support from technical staff is also available as well as support can be provided by Graduate Academic Assistants (GAAs) and Student Learning Assistants (SLAs).
- Formative feedback is given throughout the modules at appropriate stages and on completion of student coursework.
- Research activities of academic staff feed into the teaching programme, which can provide individual students with ad-hoc opportunities to work with academics on some aspect of research.

Middlesex University encourages and supports students with disabilities. Some practical aspects of Science and Technology programmes may present challenges to students with particular disabilities. Students are encouraged to visit our campuses at any time to evaluate facilities and talk in confidence about their needs. If we know students' individual needs, we will be able to provide for them more easily. For further information contact the Disability Support Service (email: disability@mdx.ac.uk).

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17. HECos code(s)	100170 – mechatronics and robotics

18. Relevant QAA subject benchmark(s)	Engineering (2023)

19. Reference points

The following reference points were used in designing the programme:

- Middlesex University Regulations;
- Middlesex University Learning and Quality Enhancement Handbook;
- UK Standard for Professional Engineering Competence;
- Chartered Engineer and Incorporated Engineer Standard, Engineering Council UK, 2020;
- The Accreditation of Higher Education Programmes, Engineering Council UK, 2020;
- IED Engineering Design Specific Learning Outcomes for EC (UK) Accredited Degree Programmes.
- QAA UK Quality Code for Higher Education
- QAA Framework for Higher Education Qualifications
- QAA guidelines for programme specifications
- QAA Code of Practice for the assurance of academic quality and standards in HE

- University policy on equal opportunities

20. Other information

Please note programme specifications provide a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably be expected to achieve if they take full advantage of the learning opportunities that are provided. More detailed information about the programme can be found in the rest of your programme handbook and the university regulations.

21. Curriculum map for BEng (Hons) Mechatronics & Robotics Engineering

This section shows the highest level at which programme outcomes are to be achieved by all graduates, and maps programme learning outcomes against the modules in which they are assessed.

Programme learning outcomes

Knowledge and understanding	
A1	Apply knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems. Some of the knowledge will be at the forefront of the particular subject of study (AHEP4 C1)
A2	Analyse complex problems to reach substantiated conclusions using first principles of mathematics, statistics, natural science and engineering principles (AHEP4 C2)
A3	Select and evaluate technical literature and other sources of information to address complex problems (AHEP4 C4)
A4	Evaluate the environmental and societal impact of solutions to complex problems and minimise adverse impacts (AHEP4 C7)
A5	Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct (AHEP4 C8)
A6	Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion (AHEP4 C11)
A7	Discuss the role of quality management systems and continuous improvement in the context of complex problems (AHEP4 C14)
A8	Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights (AHEP4 C15)
A9	Plan and record self-learning and development as the foundation for lifelong learning/CPD (AHEP4 C18)
Skills	
B1	Select and apply appropriate computational and analytical techniques to model complex problems, recognising the limitations of the techniques employed (AHEP4 C3)
B2	Design solutions for complex problems that meet a combination of societal, user, business and customer needs as appropriate. This will involve consideration of applicable health & safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards (AHEP4 C5)
B3	Apply an integrated or systems approach to the solution of complex problems (AHEP4 C6)
B4	Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity (AHEP4 C9)
B5	Adopt a holistic and proportionate approach to the mitigation of security risks (AHEP4 C10)
B6	Use practical laboratory and workshop skills to investigate complex problems (AHEP4 C12)
B7	Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations (AHEP4 C13)
B8	Function effectively as an individual, and as a member or leader of a team (AHEP4 C16)

B9	Communicate effectively on complex engineering matters with technical and non-technical audiences (AHEP4 C17)

Programme outcomes																	
A1	A2	A3	A4	A5	A6	A7	A8	A9	B1	B2	B3	B4	B5	B6	B7	B8	B9
Highest level achieved by all graduates																	
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

Module Title	Module Code by Level	A1	A2	A3	A4	A5	A6	A7	A8	A9	B1	B2	B3	B4	B5	B6	B7	B8	B9
Level 4																			
Practical Applications of Mathematics for Engineers [30]	PDE1821	X	X								X								
Electronic Engineering Principles and Applications [30]	PDE1822	X	X									X					X		
Physical Computing and Programming [30]	PDE1823			X									X			X			
Engineering Projects [30]	PDE1824							X	X	X						X	X	X	X
Level 5																			
Mechatronics [30]	PDE2821	X	X									X	X			X		X	X
Sensors, Actuators and Control [30]	PDE2822	X						X					X			X			
Design & Engineering in Context [30]	PDE2317			X	X	X	X	X	X			X		X	X			X	X
Robotics [30]	PDE2823	X	X									X				X	X		X
Level 6 (TKSW mode only)																			
Industrial Placement	PDE3250				X	X	X		X	X	X	X		X	X				X
Level 6																			
Artificial Intelligence (AI) in Robotics [30]	PDE3802	X									X					X			X

Mechatronic Systems and Industry 4.0 [30]	PDE3822	X	X		X			X	X		X	X	X			X		X	X
Major Project and Professional Practice [60]	PDE3823			X		X	X		X	X		X		X			X		X

UN Sustainable Development Goals mapped to the programme modules:

UN SDGs / Module	1 No Poverty	2 Zero Hunger	3 Good Health and Well-Being	4 Quality Education	5 Gender Equality	6 Clean Water and Sanitation	7 Affordable and Clean Energy	8 Decent Work and Economic Growth	9 Industry, Innovation and Infrastructure	10 Reduced Inequalities	11 Sustainable Cities and Communities	12 Responsible Consumption and Production	13 Climate Action	14 Life Below Water	15 Life on Land	16 Peace, Justice and Strong Institutions	17 Partnerships for the Goals
PDE1821							X		X		X				X		
PDE1822			X				X		X		X	X					
PDE1823			X	X					X		X	X			X		
PDE1824		X	X	X		X	X		X		X	X			X		
PDE2821		X	X	X			X		X		X	X			X		
PDE2822			X	X			X		X		X	X			X		
PDE2317	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
PDE2823		X	X	X			X		X		X	X			X		
PDE3802			X	X					X		X	X			X		
PDE3822			X	X					X		X	X			X		
PDE3823		X	X	X				X	X		X	X	X		X		