Programme Specification 2025-26

1.	**Programme title**	MSc Mechatronic Systems Engineering
2.	**Awarding institution**	Middlesex University
3a	**Teaching institution**	1 Middlesex University London
3b	**Language of study**	English

4a	**Valid intake dates and mode of study**

Mode of Study	Cohort	Delivery Location	Duration
Full-time (FT)	Semester 1	Hendon	1 Years
Part-time (PT)	Semester 1	Hendon	2 Years

4c	**Delivery method**	On Campus/Blended Learning

5. Professional/Statutory/Regulatory body (if applicable)
N/A

6.	**Apprenticeship Standard** (if applicable)	N/A

7. Final qualification(s) available
Target Award Title(s)
MSc Mechatronic Systems Engineering
Exit Award Title(s)
PGCert Mechatronic Systems Engineering
PGDip Mechatronic Systems Engineering

8. Academic year effective from	2025-26

9. Criteria for admission to the programme
We normally require a second class honours degree 2:2 or above in computer science, science or engineering disciplines. We also encourage applications from experienced engineers or graduates from wider engineering disciplines.

Candidates with other degrees are welcome to apply provided they can demonstrate appropriate levels of relevant experience. Candidates without formal qualifications need to demonstrate relevant work experience and the ability to study at postgraduate level.

It is also highly desirable to be familiar with a relevant high level programming language such as C or Python prior to joining the programme.

Successful applicants must have competence in the English language. For international applicants whose first language is not English, the requirement is that they have IELTS 6.5 (with a minimum of 6.0 in each component) or TOEFL internet-based 87 (with at least 21 in listening & writing, 22 in speaking and 23 in reading).

10. Aims of the programme

The programme aims to:

The programme aims to develop competent and highly sought after Mechatronic Systems Engineers. It will achieve this by consolidating key technological knowledge and skills in designing and developing mechatronic systems for a variety of industry applications and for a diverse range of employment sectors such as industrial automation, robotics, digital manufacturing, systems integration, healthcare, food and beverage etc.
The programme will also focus on equipping students with new skills and knowledge needed for implementing Industry 4 related technologies such as Cyber Physical Systems, Digital Twins, Virtual Commissioning, Remote Monitoring and Data Analytics and other such technologies by working closely with industry partners leading the development of these technologies.

11. Programme learning outcomes

Programme - Knowledge and Understanding

On completion of this programme the successful student will have a knowledge and understanding of:

1. Apply a systematic understanding of comprehensive knowledge and specialist theoretical and methodological approaches to relevant subject principles (engineering, statistics, mathematics, management) to the solution of complex problems in mechatronic systems. (AHEP4 M1)

2. Critically analyse and specify hardware and software requirements of mechatronic systems and related sensing and control methods for effective system level solutions.

3. Design, develop and test control solutions for automated smart systems, including machine learning.

4. Formulate and critically analyse complex mechatronic systems and to offer conclusions and recommendations for performance and/or efficiency improvements. (AHEP4 M2)

5. Develop a system hierarchy for mechanical, electrical and software integration solutions, including data communications.

6. Formulate and apply fundamental simulation techniques using a systems approach to real-world manufacturing processes and systems.

7. Design solutions for complex problems that evidence some originality to address stakeholder needs (user, business, societal, environmental, cultural, diversity, inclusion, etc.), as well as complying with constraints such as commercial, legal, professional and industry standards. (AHEP4 M5)
Programme - Skills On completion of this programme the successful student will be able to:
8. Select, adapt and apply computational and analytical techniques to model complex problems related to mechatronic systems. (AHEP4 M3)
9. Build, test and optimise integrated mechatronic system solutions using appropriate tools and techniques.
10. Produce digital models with integrated data flow between physical and virtual systems and their behaviour.
11. Carry out technical literature reviews and critically evaluate these to solve complex problems related to the programme. (AHEP4 M4)
12. Design and implement AI/ML solutions in mechatronic or robotic systems.
13. Evaluate the business, environmental and societal impact of solutions to complex problems and manage their impact by considering using Product Lifecyle Management approaches, including Product Data management and Application Lifecyle Management.
14. Work effectively as a reflective practitioner as a member of a team as well as an individual and assess own and team performance.
15. Communicate complex technical and academic content effectively in both oral and written forms to a technical and non-technical audience.

12. Teaching/learning methods

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 workshops, 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.

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, emphasizing 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 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 emphasizes 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.

Students learn skills through a combination of lectures, practical project work, participation in workshops, directed reading, independent study, facilitated discussion, individual and collaborative work and research.

Analyses and critical thinking are strengthened through participation in discussions and independent study.

Formative and post-assessment feedback is provided on all assessed coursework.

Approx. number of timetabled hours per week (at each level of study, as appropriate), including on-campus and online hours FT - 12, PT- 6.

Approx. number of hours of independent study per week (at each level of study, as appropriate) FT - 28, PT - 14.

13. Employability

13a Development of graduate competencies

13b Employability development

During the course, students will acquire a profound understanding of topics related to mechatronic systems, equipping them to excel in designing, developing, analysing and integrating a variety of mechatronic and industrial automation systems. Students will also participate in interactive projects and workshops, gaining practical skills that replicate real-world industrial practices, supported by state-of-the-art labs and tools. The course will help students develop into a forward-thinking professional who thrives in ever-changing technological landscapes. The curriculum is crafted to enhance their innovative capabilities, preparing them to tackle complex industrial systems and associated challenges. The course will also offer the students the opportunity to gain current industry practices through our close engagement with key industry partners, known to be the world leaders of technologies related to the course. Talks from industry professionals will provide students with operational insight into the world of mechatronics and automation systems. This focus will enhance students' skills in understanding how to work as part of a multidisciplinary team.
Where possible, student will be encouraged to take part in competitions such as Connected Curriculum competition organised by Siemens and the national competitions such as those organised by WorldSkills in their discipline.
To further enhance student development, the curriculum will also encourage the cultivation of entrepreneurial skills, preparing students to innovate and adapt within the strength and conditioning field. By fostering an entrepreneurial mindset, students will be equipped to identify opportunities, develop new services, and navigate the evolving landscape of the industry with confidence. Much of this work will be covered in the individual project where students will have the opportunity to develop their personal interest and align themselves with their chosen career path.
Co-leadership will be encouraged by involving student representatives in the curriculum design through Student Voice Leaders (SVLs) and soliciting module feedback to enhance the student experience. Digital literacy will be integrated into coursework, equipping students with essential skills for academic and professional success. Employability will be prioritised through robust employer connections, providing internships (where possible), opportunities that align with students' career aspirations, ensuring they graduate with relevant competencies for the field of Mechatronics.
Collaborating with industry professionals and utilising the experiences of qualified staff that also consult within the field, ensures the curriculum remains relevant and aligned with market demands. In addition, aligning the programme competencies with international standards such as the WorldSkills International places students in advantageous position as these directly align with the employer demands for their discipline.

In addition, as the department being a founding member of the Connected Curriculum project led by Siemens and Festo, two of the sector leading organisations in automation and digital manufacturing including Industry 4 technologies, this gives the programme additional benefits not available elsewhere.

Our internal dedicated professional services unit, Employability Services, aims to provide services such as:
oEmployability skills and training
oPersonalised 1:1 support for the postgraduate cohort
oEmployer engagement, vacancy sourcing and advocacy

oPlacement administration, etc.

13c Placement and work experience opportunities (if applicable)

N/A

13d Future careers / progression

The programme team works closely with external employer consortiums such as GAMBICA which represents manufacturers of Automation and Process Control equipment in the UK. This provides direct access to employers which opens unique opportunities for the students on the programme.

Graduates from the programme will be equipped to enter into employment that requires high-level skills in industrial control, robotic or mechatronic system design and integration with highly specialised practical skills in automated solutions, embedded systems, digital twins, machine learning, etc. that are highly sought after worldwide.

14. Assessment methods

Students' knowledge, understanding and skills are assessed by a combination of individual and collaborative lab and other coursework, project work, including both software and hardware development, reports and presentations.

15. Programme Structure (level of study, modules, credits and progression requirements)

Structure is indicative for Part-time routes.

Students must take all of the compulsory modules and choose following programme requirements from the optional modules.

Non-compensatable modules are noted below.

Available Pathways

Not Applicable

Year 1

Year 1 Level 7 FT and PT

Code	Type	Module Title	Credits at FHEQ Level
PDE4446	Compulsory	Sensing and Motion Control 2025-26	30 at Level 7
PDE4431	Compulsory	Robot Manipulation 2025-26	15 at Level 7
PDE4521	Compulsory	Digital Product	15 at Level 7

		Modelling and Automation 2025-26	
PDE4444	Compulsory	Machine Learning for Engineers 2025-26	15 at Level 7
PDE4445	Compulsory	Individual Project 2025-26	60 at Level 7
PDE4443	Compulsory	Engineering Sustainability 2025-26	15 at Level 7
PDE4515	Compulsory	Mechatronic Systems Integration Group Project 2025-26	30 at Level 7

Year 2

Year 2 Level 7 PT

Code	Type	Module Title	Credits at FHEQ Level
PDE4446	Compulsory	Sensing and Motion Control 2026-27	30 at Level 7
PDE4445	Compulsory	Individual Project 2026-27	60 at Level 7
PDE4515	Compulsory	Mechatronic Systems Integration Group Project 2026-27	30 at Level 7

*Please refer to your programme page on the website re availability of option modules

16. Programme-specific support for learning
Meeting the learning outcomes of this programme requires active participation in the subject and the development of autonomous practice in meeting objectives. Supporting this level of active participation and autonomous practice is achieved via regular weekly tutorial contact with academic staff, productive and informed support from technical staff and the use of online, resource-based learning materials where appropriate. The subject provides extensive facilities where students can engage with their coursework assignments in a supported and productive environment.

17. HECos code(s)	100170: Mechatronics and Robotics

18. Relevant QAA subject benchmark(s)	

19. University Regulations
This programme will run in line with general University Regulations: Policies | Middlesex University

This programme will run in line with general University Assessment Regulations.

20. Reference points

The following reference guidance notes were used in designing and reviewing this programme:
•QAA: The Frameworks for Higher education Qualifications of UK Degree-Awarding Bodies, February 2024
•QAA Subject Benchmark Statements: Engineering, March 2023
•QAA Characteristic Statement Master's Degree, February 2020
•UK Standard for Professional Engineering Competence (UKSPEC)
•Middlesex University's Policy, Regulations and Guidelines
•Middlesex University's Learning and Quality Enhancement Handbook
•QAA The UK Quality Code for Higher Education, May 2023
•The Accreditation of Higher Education Programmes (AHEP), 2020
•Middlesex University policy on equal opportunities
•Made Smarter Review 2017
•Engineering UK Report 2024
•WorldSkills Occupational Standards – Mechatronics (2020 & 2024)
•2031 Learning Framework principles, Middlesex University

21. Other information *(if applicable)*

Middlesex University is a member of the Connected Curriculum Project organised by Siemens and Festo to link industry practices to the academic curriculum.
Middlesex University is also a member of GAMBICA, a trade organisation representing industry organisations in Automation, Control and Process Industries.
The department of Design Engineering and Mathematics is a member of the Engineering Professors Council (EPC) and SEFI (European Society for Engineering Education) and Women's Engineering Society (WES).

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.

Curriculum map for MSc Mechatronic Systems Engineering / MSc Mechatronic Systems Engineering with Professional Placement (15 months) / MSc Mechatronic Systems with Professional Placement (24 months)

Programme Learning Outcomes

Knowledge and Understanding

A1	Apply a systematic understanding of comprehensive knowledge and specialist theoretical and methodological appr subject principles (engineering, statistics, mathematics, management) to the solution of complex problems in mecha (AHEP4[1] M1)
A2	Critically analyse and specify hardware and software requirements of mechatronic systems and related sensing and effective system level solutions.
A3	Design, develop and test control solutions for automated smart systems, including machine learning.
A4	Formulate and critically analyse complex mechatronic systems and to offer conclusions and recommendations for p efficiency improvements. (AHEP4 M2)
A5	Develop a system hierarchy for mechanical, electrical and software integration solutions, including data communica
A6	Formulate and apply fundamental simulation techniques using a systems approach to real-world manufacturing pro
A7	Design solutions for complex problems that evidence some originality to address stakeholder needs (user, business environmental, cultural, diversity, inclusion, etc.), as well as complying with constraints such as commercial, legal, p industry standards. (AHEP4 M5)

Skills

B1	Select, adapt and apply computational and analytical techniques to model complex problems related to mechatronic M3)
B2	Build, test and optimise integrated mechatronic system solutions using appropriate tools and techniques.
B3	Produce digital models with integrated data flow between physical and virtual systems and their behaviour.
B4	Carry out technical literature reviews and critically evaluate these to solve complex problems related to the program
B5	Design and implement AI/ML solutions for mechatronic or robotic systems and applications.
B6	Evaluate the business, environmental and societal impact of solutions to complex problems and manage their impa using Product Lifecycle Management approaches, including Product Data management and Application Lifecyle Ma M7)
B7	Work effectively as a reflective practitioner as a member of a team as well as an individual and assess own and tea (AHEP4 M16)
B8	Communicate complex technical and academic content effectively in both oral and written forms to a technical and audience. (AHEP4 M17)

Programme learning outcomes - Highest level achieved by graduates

A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	B8
7	7	7	7	7	7	7	7	7	7	7	7	7	7	7

[1] The Accreditation of Higher Education Programmes (AHEP) outlines the purpose and application process for universities that wish to secure or maintain accreditation of their programmes. The terms M1, M2, M3, etc., on the Engineering Council's AHEP framework represent the specified learning outcomes and competency areas required for accreditation.

Mapping by level of study and module

Module Title	Module Code by Level of study	A1	A2	A3	A4	A5	A6	A7	B1	B2	B3	B4	B5	B6	B7	B8
Digital Product Modelling and Automation	PDE4521	X		X		X			X		X					
Robot Manipulation	PDE4431	X			X	X	X									X
Sensing and Motion Control	PDE4446	X	X	X	X	X			X	X		X		X		X
Machine Learning for Engineers	PDE4444			X			X	X	X		X		X			X
Engineering Sustainability	PDE4443	X						X				X		X	X	X
Mechatronic Systems Integration Group Project	PDE4515	X	X	X	X	X	X		X	X	X			X	X	X
Individual Project	PDE4445	X	X		X	X	X	X	X	X		X	X	X		X
Postgraduate Professional Placement	PDE4261	X	X		X	X	X	X		X	X			X	X	X
Postgraduate Professional Placement (extended)	PDE4262	X	X		X	X	X	X		X	X			X	X	X