MSc *Robotics*

Programme Specification

1. Programme title	MSc Robotics
2. Awarding institution	Middlesex University
3. Teaching institution	Middlesex University Hendon and Dubai
4. Details of accreditation by professional/statutory/regulatory body	
5. Final qualification(s) available	MSc Robotics PGDip Robotics PGCert Robotics
6. Year effective from	2021/22
7. Language of study	English
8. Mode of study	Full-time / part-time

9. Criteria for admission to the programme

An Honours degree normally classified 2.2 or above, or equivalent, in engineering, computer science or a related area, with evidence of previous coding experience.

Successful applicants must have competence in English language. For international applicants whose first language is not English the requirement is that they have IELTS 6.5 (with minimum 6.0 in each components) 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:

- Consolidate student knowledge about the state of the art, challenges and current developments in robotics.
- Provide students with a thorough grounding in software and hardware skills and techniques within the context of robotics.
- Develop advanced skills in designing, implementing and analysing robotics systems.
- Develop students' academic and scientific skills in researching, experimenting and presenting their work.
- Provide students with the technical and practical skills sought by employers.

11. Programme outcomes*

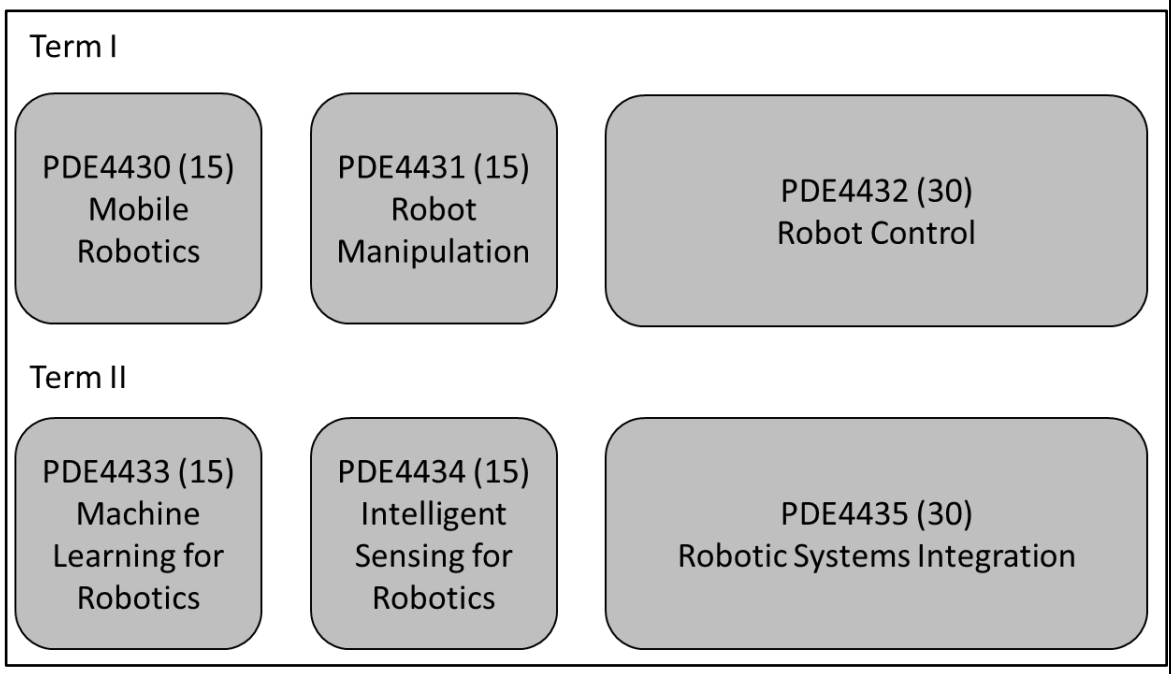
A. Knowledge and understanding On completion of this programme the successful student will have knowledge and understanding of: A1 Principles of robotics and autonomous systems. A2 Robot components and means of integrating them in complex robotic systems to achieve high level tasks. A3 Advanced techniques related to robotics developments in industry and academia. A4 Current topics in robotics, recent trends and future developments.	**Teaching/learning methods** Students gain knowledge and understanding through a combination of lectures and practical lab sessions, directed reading, independent study, coursework and research. Formative and post-assessment feedback is provided on all assessed coursework. **Assessment methods** Students' knowledge and understanding is assessed by a combination of individual and team coursework, project work, reports and presentations.
B. Skills On completion of this programme the successful student will be able to: B1 Critically evaluate advanced science and engineering concepts, theories, models and techniques. B2 Apply knowledge in robotics and related areas to address unfamiliar problems.	**Teaching/learning methods** 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. **Assessment methods**

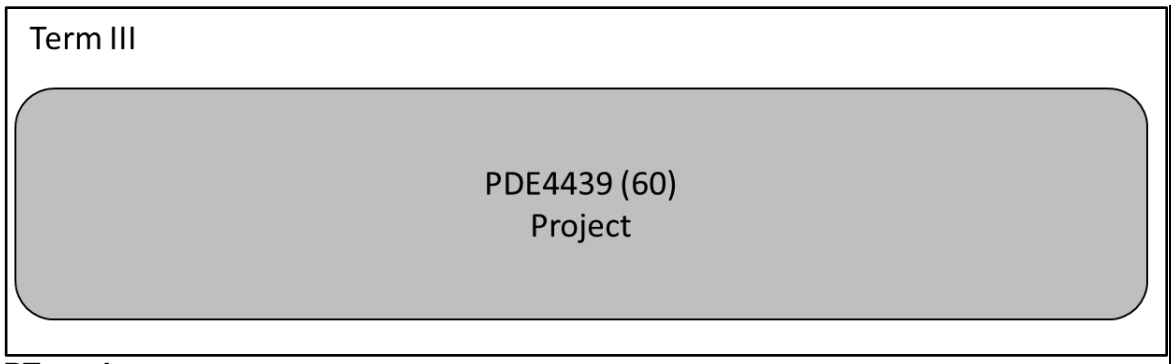
B3 Systematise a problem in robotics, recognise its constraints, and design an effective strategy to solve it. B4 Confidently employ a range of hardware and software tools in robotics. B5 Program robots to perform given tasks using appropriate software. B6 Carry out formal testing of a robotic system or component, critically evaluating its features and performance. B7 Plan and execute projects in robotics, both in groups and individually, and perform critical reflective analysis of the achieved outcome. B8 Communicate technical and academic content effectively in both oral and written forms.	Students' 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.

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

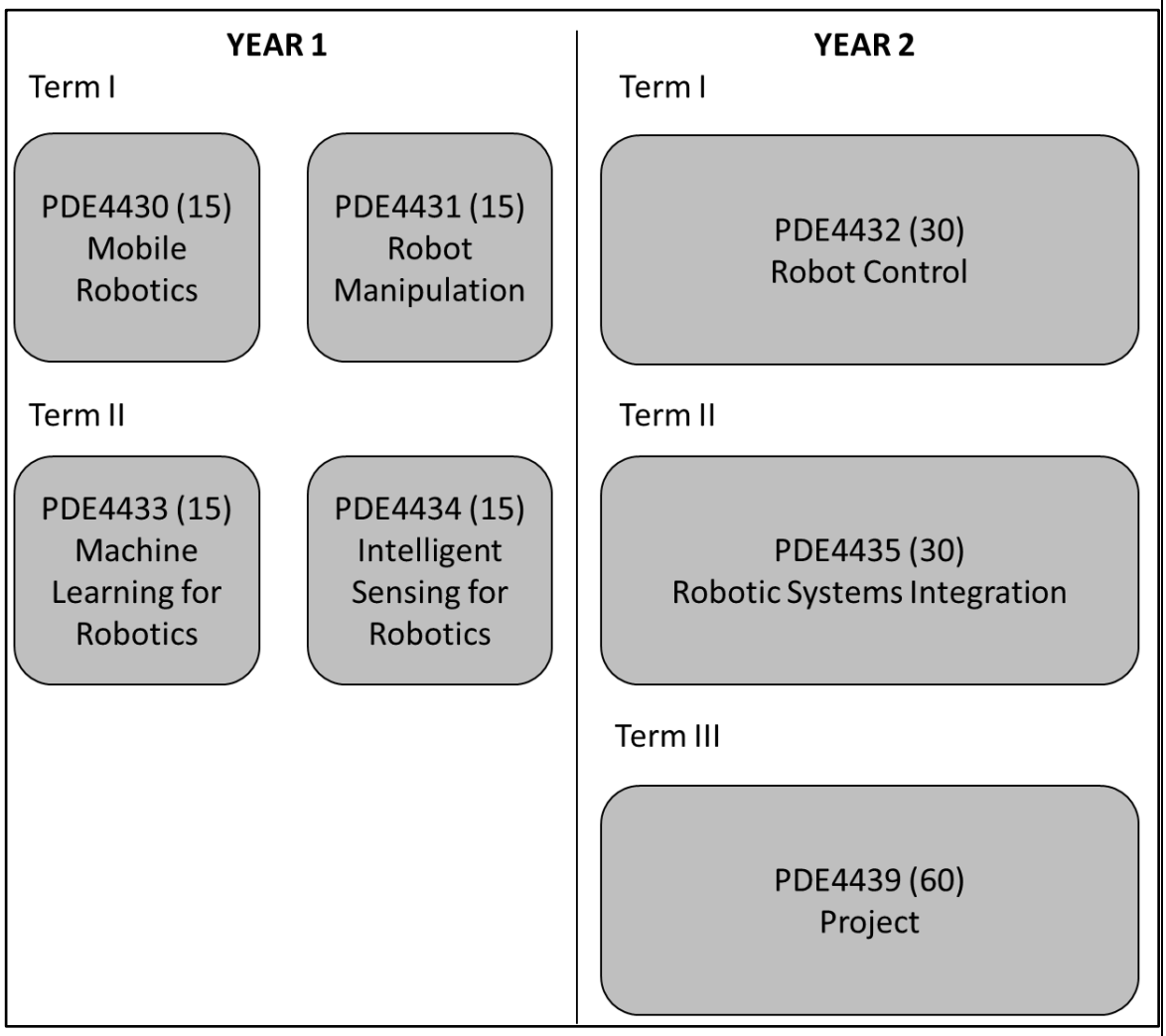
12. 1 Overall structure of the programme

FT mode





PT mode



Progress to *PDE4439 Project* requires completion of all other modules (120 credits).

Students completing 60 credits are eligible for PGCert *Robotics*.

Students completing 120 credits are eligible for PGDip *Robotics*.

12.2 Levels and modules		
Level 7		
COMPULSORY	OPTIONAL	PROGRESSION REQUIREMENTS
Students must take all of the following: PDE4430 PDE4431 PDE4432 PDE4433 PDE4434 PDE4435 PDE4439		Students must pass 120 credits (all other modules) to continue with the final individual 60-credit project PDE4439. Term 2 modules can nevertheless be undertaken before passing Term 1 modules.

12.3 Non-compensatable modules	
Module level	**Module code**
7	PDE4439

13. Information about assessment regulations

Middlesex University Assessment Regulations apply to this programme, without exception.

14. Placement opportunities, requirements and support

N/A

15. Future careers / progression

Robotics plays a large and increasing role in manufacturing and product handling, exploration in extreme environments (space, oceans, caves), the office and the home, with products including: unmanned ground and air vehicles, automated warehousing and delivery solutions, autonomous robot cleaning and other household devices, semi-autonomous biomedical and assistive applications, toys and gaming, etc. Graduates of the programme will be well equipped for careers as robotics engineers in a range of industries and SMEs, from advanced manufacturing and handling, to oil and gas exploration, nuclear energy to railways and automotive, healthcare to defence. Enrolment in PhD programs and pursuing further academic development and research is also a likely progression outcome.

16. Particular support for learning (if applicable)

- Dedicated robotics and mechatronics facilities equipped with the latest industrial automation equipment and an integrated flexible manufacturing system.

- Virtual Learning Environment and dedicated CAD/CAM equipment, electronics manufacturing and prototyping facilities.
- Inspiring guest speakers from industry and academia.
- English Language Support and Numeracy support offered by the Learner Development Unit.

17. JACS code (or other relevant coding system)	H671
18. Relevant QAA subject benchmark group(s)	Engineering

19. Reference points

- QAA Framework for Higher Education Qualifications
- QAA Characteristic Statement for Master's Degrees
- Middlesex University Regulations

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 s/he takes 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 *Robotics*

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	Principles of robotics and autonomous systems.
A2	Robot components and means of integrating them in complex robotic systems to achieve high level tasks.
A3	Advanced techniques related to robotics developments in industry and academia.
A4	Current topics in robotics, recent trends and future developments.
Skills	
B1	Critically evaluate advanced science and engineering concepts, theories, models and techniques.
B2	Apply knowledge in robotics and related areas to address unfamiliar problems.
B3	Systematise a problem in robotics, recognise its constraints, and design an effective strategy to solve it.
B4	Confidently employ a range of hardware and software tools in robotics.
B5	Program robots to perform given tasks using appropriate software.
B6	Carry out formal testing of a robotic system or component, critically evaluating its features and performance.
B7	Plan and execute projects in robotics, both in groups and individually, and perform critical reflective analysis of the achieved outcome.
B8	Communicate technical and academic content effectively in both oral and written forms.

Programme outcomes											
A1	A2	A3	A4	B1	B2	B3	B4	B5	B6	B7	B8
Highest level achieved by all graduates											
7	7	7	7	7	7	7	7	7	7	7	7

Module Title	Module Code	A1	A2	A3	A4	B1	B2	B3	B4	B5	B6	B7	B8
Mobile Robotics	PDE4430	X	X					X	X	X			X
Robot Manipulation	PDE4431	X	X					X	X	X			X
Robot Control	PDE4432	X	X		X	X		X	X			X	X
Machine Learning in Robotics	PDE4433			X	X	X	X	X		X		X	X
Intelligent Sensing for Robotics	PDE4434		X	X	X	X			X			X	X
Robotic Systems Integration	PDE4435		X		X		X	X	X	X	X	X	X
Project	PDE4439			X	X	X	X	X	X	X	X	X	X