COURSE SPECIFICATION

BEng (Hons) Robotics and Artificial Intelligence

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Course Title	*BEng (Hons) Robotics and Artificial Intelligence*
Final Award	*BEng (Hons)*
Exit Awards	*DipHE*
Course Code / UCAS code (if applicable)	U3454PYC
Mode of study	*Full time*
Mode of delivery	*Campus*
Normal length of course	*3 years, 4 years with placement*
Cohort(s) to which this course specification applies	*from September 2024 intake onwards*
Awarding Body	*University of Portsmouth*
Teaching Institution	*University of Portsmouth*
Faculty	Faculty of Technology
School/Department/Subject Group	*School of Electrical and Mechanical Engineering*
School/Department/Subject Group webpage	*https://www.port.ac.uk/about-us/structure-and-governance/organisational-structure/our-academic-structure/faculty-of-technology/school-of-energy-and-electronic-engineering*
Course webpage including entry criteria	*https://www.port.ac.uk/study/courses/undergraduate/beng-hons-robotics-and-artificial-intelligence*
Professional and/or Statutory Regulatory Body accreditations	*IET*
Quality Assurance Agency Framework for Higher Education Qualifications (FHEQ) Level	*level 6*

This course specification provides a summary of the main features of the course, identifies the aims and learning outcomes of the course, the teaching, learning and assessment methods used by teaching staff, and the reference points used to inform the curriculum.
This information is therefore useful to potential students to help them choose the right course of study, to current students on the course and to staff teaching and administering the course.

Further detailed information on the individual modules within the course may be found in the relevant module descriptors and the Course Handbook provided to students on enrolment.

Please refer to the Course and Module Catalogue for further information on the course structure and modules.

Educational aims of the course

This course aims to equip students with the skills necessary to succeed in the future robotic and automation industry. The programme aims to provide students with a comprehensive understanding of both the theoretical foundations and practical applications of these fields. Here are some key educational aims of the programme:

- *The programme aims to equip students with technical skills in areas such as computer programming, mathematics, algorithms, machine learning, and robotics engineering. This includes proficiency in programming languages commonly used in AI and robotics, such as Python, C++, etc.*
- *Understanding of AI and Robotics Concepts: Students are expected to gain a deep understanding of fundamental concepts in electronics, robotics and AI, including machine learning, control theory, and autonomous systems.*
- *Problem-Solving Abilities: The programme aims to develop students' ability to identify, formulate, and solve complex problems in robotics and AI. This involves both theoretical problem-solving and hands-on experience with designing, implementing, and testing robotic systems and AI algorithms.*
- *Interdisciplinary Knowledge: Robotics and AI are inherently interdisciplinary fields, drawing upon concepts from electronics, computer science, engineering and mathematics. The degree program aims to provide students with a broad interdisciplinary foundation, enabling them to work effectively across different domains.*
- *Practical Experience: The programme incorporates hands-on projects, placement or co-op experiences to provide students with practical skills and real-world experience. This could involve building robots, developing AI algorithms, working on industry-sponsored projects, or participating in research initiatives.*

Overall, the programme aims to prepare students for a wide range of careers in industries such as manufacturing, healthcare, transportation, entertainment, and more, where robotic and AI technologies are increasingly playing a transformative role.

Course Learning Outcomes and Learning, Teaching and Assessment Strategies

The Quality Assurance Agency for Higher Education (QAA) sets out a national framework of qualification levels, and the associated standards of achievement are found in their Framework for Higher Education Qualifications document.

The Course Learning Outcomes for this course are outlined in the tables below.

A. Knowledge and understanding of:			
LO number	**Learning outcome**	**Learning and Teaching methods**	**Assessment methods**
A1	A comprehensive understanding of Mechanisms, Robotics, Automations, programming, Electric Machines, Actuators, Artificial Intelligence, Machine learning, Electrical power systems technology, Kinematics and Dynamics of Robots, Signal processing, Engineering management, economics and risk analysis, embedded system, Control systems, Instrumentations and sensors, Microcontroller, Programmable logic controller, Analogue and digital systems, Innovation and enterprise.	Lectures, laboratory work, group work, simulations	Essays, Course works, portfolios, presentations, Exam
A2	Appropriate mathematical methods	Lectures, group work	Essays, Course works, Presentations, Exam
A3	The role of computing and simulation in the solution of problems, including hardware description languages	Lectures, laboratory work, group work, simulations	Essays, Course works, Presentations, Exam
A4	Practical design of electronic, computer and software systems	Lectures, laboratory work, group work, simulations	Essays, Course works, Presentations, Exam
A5	The business context of engineering: commercial, legal, contractual and statutory frameworks	Lectures	Essays, Course works, Presentations
A6	Professional and ethical responsibility	Lectures, laboratory work, group work,	Essays, Course works, Presentations

B. Cognitive (Intellectual or Thinking) skills, able to:			
LO number	**Learning outcome**	**Learning and Teaching methods**	**Assessment methods**
B1	Select, acquire and apply appropriate knowledge of communications, electronic, software, computer and principles to model and analyse systems	Lectures, laboratory work, group work, simulations	Essays, Course works, portfolios, presentations, Exam
B2	Select and apply appropriate mathematical methods to model, analyse, plan or program electronic systems	Lectures, laboratory work, group work, simulations	Essays, Course works, portfolios, presentations, Exam
B3	Select and apply computer-based design and simulation techniques	Lectures, group work, simulations	Essays, Course works, portfolios, presentations, Exam
B4	Design, build and test systems and subsystems to meet specified sometimes conflicting requirements	Lectures, laboratory work, group work, simulations	Essays, Course works, portfolios, presentations, Exam
B5	Assess electronic, software and computer systems from commercial and statutory viewpoints, including assessment of risks	laboratory work, group work, simulations	Essays, Course works
B6	Solve problems in a systematic and manageable manner	Lectures, laboratory work, group work, simulations	Course works, Exam

C. Practical (Professional or Subject) skills, able to:			
LO number	**Learning outcome**	**Learning and Teaching methods**	**Assessment methods**
C1	Use standard and specialist laboratory instruments, conduct experiments and report on them	laboratory work, group work,	Essays, Course works
C2	Use computer-based simulation, design and software development tools	Lectures, laboratory work, group work, simulations	Essays, Course works
C3	Design, construct, test and evaluate electronic circuits and computer systems	laboratory work, group work,	Essays, Course works
C4	Search a range of sources for information pertinent to technical and professional tasks	group work, *seminars,* Web searches	Essays, Course works
C5	Plan, manage and undertake a range of engineering projects, considering constraints	Lectures, laboratory work, group work,	Essays, Course works

D. Transferrable (Graduate and Employability) skills, able to:			
LO number	**Learning outcome**	**Learning and Teaching methods**	**Assessment methods**
D1	Manipulate and present information	Lectures, laboratory work, group work,	Essays, Course works
D2	Analyse scientific and technical information in the solution of problems	Lectures, laboratory work, group work,	Essays, Course works
D3	Use information technology to handle text and data and for simulation and design	Lectures, group work,	Essays, Course works
D4	Develop solutions in a creative manner, sometimes based on inadequate information	Lectures, laboratory work, group work,	Essays, Course works, Exam
D5	Communicate effectively in a variety of formats	Lectures, laboratory work, group work,	Essays, Course works, presentations
D6	Work effectively as an individual and as part of a team to achieve goals	laboratory work, group work,	Essays, Course works, presentations, exam

Academic Regulations

The current University of Portsmouth Academic Regulations: Examination & Assessment Regulations will apply to this course. Approved course exemptions can be found here.

Support for Student Learning

The University of Portsmouth provides a comprehensive range of support services for students throughout their course, details of which are available at the MyPort student portal.

Evaluation and Enhancement of Standards and Quality in Learning and Teaching

The University of Portsmouth undertakes comprehensive monitoring, review and evaluation of courses within clearly assigned staff responsibilities. Student feedback is a key feature in these evaluations, as represented in our Policy for Listening to and Responding to the Student Voice where you can also find further information.

Reference Points

The course and outcomes have been developed taking account of:

Insert additional reference points or delete as required

- University of Portsmouth Curriculum Framework Specification
- University of Portsmouth Vision
- Office for Students Conditions of Registration
- University of Portsmouth Code of Practice for Work-based and Placement Learning
- Quality Assurance Agency UK Quality Code for Higher Education
- Quality Assurance Agency Qualification Characteristic Statements
- Quality Assurance Agency Subject Benchmark Statement for **enter the relevant statement for this course**
- Quality Assurance Agency Framework for Higher Education Qualifications
- Requirements of Professional and/or Statutory Regulatory Bodies: **IET**
- Vocational and professional experience, scholarship and research expertise of the University of Portsmouth's academic members of staff
- National Occupational Standards

Changes to your course/modules

The University of Portsmouth has checked the information provided in this Course Specification and will endeavour to deliver this course in keeping with this Course Specification. However, changes to the course may sometimes be required arising from annual monitoring, student feedback, and the review and update of modules and courses.

Where this activity leads to significant changes to modules and courses there will be prior consultation with students and others, wherever possible, and the University of Portsmouth will take all reasonable steps to minimise disruption to students.

It is also possible that the University of Portsmouth may not be able to offer a module or course for reasons outside of its control, for example, due to the absence of a member of staff or low student registration numbers. Where this is the case, the University of Portsmouth will endeavour to inform applicants and students as soon as possible, and where appropriate, will facilitate the transfer of affected students to another suitable course.

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