Template C4

Kingston University London

Programme Specification

Title of Course: *BEng (Hons) Robotic Engineering and Artificial Intelligence top up*

Date first produced	29/08/2025
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Version number	1
Faculty	Faculty of Engineering, Computing and the Environment
Cross-disciplinary	
School	School of Engineering
Department	Department of Mechanical Engineering
Delivery Institution	Polytechnics Mauritius Limited (PML)

This Programme Specification is designed for prospective students, current students, academic staff and employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if they take full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes and content of each modules can be found in the course VLE site and in individual Module Descriptors.

SECTION 1: GENERAL INFORMATION

Award(s) and Title(s):	BEng (Hons) Robotic Engineering and Artificial Intelligence
Exit Award(s) and Title(s):	Ordinary Degree
Course Code *For each pathway and mode of delivery*	UFRAI1RAI10
UCAS code *For each pathway*	N/A

Awarding Institution:	Kingston University
Teaching Institution:	Polytechnics Mauritius Limited (PML)
Location:	Polytechnics Mauritius Limited (PML)
Language of Delivery:	English
Delivery mode:	Primarily campus based (up to 20% of scheduled L&T hours delivered online)
Learning mode(s):	Full-time
Minimum period of registration:	Full-time - 1
Maximum period of registration:	Full-time - 2
Entry requirements	Applicants must meet one of the following entry qualification requirements: 1. PML Diploma in Robotic and Automation Engineering and a bridging module evidencing `Machine Learning and Computer Vision` core learning. 2. Case by case consideration of equivalent academic and professional qualifications achieved at comparable levels A minimum overall IELTS score of 6.0 with a minimum of 5.5 each element, iBT TOEFL 80 with R at 20, L at 19, S at 21 and W at 20 or equivalent is

	required for those for whom English is not their first language. A minimum of a Credit pass at the G.C.E O/L English Language exam will also be considered as equivalent to this level. We will consider a range of alternative qualifications or experience that is equivalent to the typical offer. Applications from international students with equivalent qualifications are welcome. All applications will be subject to the Kingston University Accreditation of Prior Learning (APL) rules and regulations applicable at the time of application.
Regulated by	The University and its courses are regulated by the Office for Students
Programme Accredited by:	Non-accredited programme
Approved Variants:	• Where a module has more than one element of assessment, in addition to the normal requirement that a student must pass the module on aggregate, there are additional requirements for the student to pass elements of assessment in the module separately in order to achieve an overall pass for the module. Such additional module-specific requirements are outlined in the Module Descriptors. • To comply with the Engineering Council regulations, a maximum of 30 credits in the programme can be compensated.
Is this Higher or Degree Apprenticeship course?	No

SECTION 2: THE COURSE

A. Aims of the Course

Emphasising the acquisition of Future Skills that businesses value, the general aim of the Robotic Engineering and Artificial Intelligence course is to equip students with the theoretical and practical knowledge necessary to design, analyse and implement robotic systems powered by cutting-edge artificial intelligence technologies, preparing students for career paths in fields such as robotics, automation, artificial intelligence development and advanced manufacturing in our increasingly interconnected and technologically advanced world.

More specific aims of the course are to:

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    - equip students with a multidisciplinary skill set and knowledge base by offering comprehensive modules throughout the programme that span across various disciplines within the field of robotic engineering and artificial intelligence.
    - develop students' analytical and problem-solving skills, along with their ability to evaluate evidence, assumptions and artificial intelligence ethics to reach sound judgements, and to effectively communicate their ideas in this technological domain.
    - furnish students with the leadership skills and know-how needed to generate new knowledge through research and development, as required for top-tier artificial intelligence and robotics professionals.
    - equip students with the research and employability skills required for postgraduate study and work in the artificial intelligence and robotics industry and related sectors.
    - provide graduates with a comprehensive understanding of key aspects of robotic systems and artificial intelligence as well as the creativity and technical skills to solve design and programming problems.
    - foster graduates' understanding of sustainability, ethics and health and safety within the robotic and artificial intelligence disciplines, and the reflective skills to continually develop themselves professionally.
    - ensure that graduates have the ability and confidence to take on leadership roles in major robotic and artificial intelligence-driven projects.

B. Programme Learning Outcomes

The programme learning outcomes are the high-level learning outcomes that will have been achieved by all students receiving this award. They have been aligned to the levels set out in 'Sector Recognised Standards in England' (OFS 2022).

Programme Learning Outcomes					
	Knowledge and Understanding On completion of the course students will be able to:		**Intellectual Skills** On completion of the course students will be able to		**Subject Practical Skills** On completion of the course students will be able to
A1	Apply a comprehensive knowledge of mathematics, science, and engineering to design, analyse and optimise robotic systems and artificial intelligence algorithms	B1	Analyse complex robotic engineering and artificial intelligence problems to reach substantiated conclusions	C1	Use practical laboratory and workshop skills to investigate and test robotic systems and artificial intelligence components and algorithms
A2	Examine the behaviour of robotic systems and artificial intelligence, including power management, control algorithms and communication protocols	B2	Select and apply appropriate computational and analytical techniques to model robotic systems and artificial intelligence processes, discussing the limitations of the techniques employed	C2	Select and apply appropriate materials, equipment, engineering technologies and processes for manufacturing and assembling robotic components and systems, recognising their limitations, and understand the principles of artificial intelligence implementations
A3	Demonstrate knowledge of materials, devices and technologies used in robotic engineering and artificial intelligence, and their limitations	B3	Select and critically evaluate technical literature and other sources of information to solve robotic engineering and artificial intelligence problems	C3	Design and conduct experiments to validate and optimise robotic systems and artificial intelligence algorithms, interpreting and presenting data in a clear and concise manner
A4	Apply knowledge of data transmission and machine learning algorithms to analyse	B4	Design robotic systems and artificial intelligence algorithms that meet desired specifications	C4	Develop practical skills to prototype and test robotic systems and artificial

	and design robust communication systems for robotic applications		and constraints, while considering factors such as safety, reliability and cost		intelligence algorithms, ensuring their effectiveness, reliability and safety
A5	Evaluate the environmental impact of robotic systems and artificial intelligence applications, designing solutions that minimise adverse impacts	B5	Identify and analyse ethical concerns related to robotic engineering and artificial intelligence projects and make reasoned ethical choices informed by professional codes of conduct	C5	Function effectively as an individual, and as a member or leader of a team, evaluating the effectiveness of own and team performance

C. Future Skills Graduate Attributes

In addition to the programme learning outcomes, the programme of study defined in this programme specification will engage students in developing their Future Skills Graduate Attributes:

1. Creative Problem Solving
2. Digital Competency
3. Enterprise
4. Questioning Mindset
5. Adaptability
6. Empathy
7. Collaboration
8. Resilience
9. Self-Awareness

D. Outline Programme Structure

Full details of each module will be provided in module descriptors and in the module canvas pages.

BEng (Hons) Robotic Engineering and Artificial Intelligence

Level 6							
BEng (Hons) Robotic Engineering and Artificial Intelligence							
Core modules	**Module code**	**Credit Value**	**Level**	**Teaching Block**	**Pre-requisites**	**Full Time**	**Part Time**
Advanced Microcontrollers	ER6005	15	6	TB1		1	
Applied Business Management	EG6026	15	6	TB1		1	
Applied Robotics and Artificial Intelligence	ER6004	30	6	Year Long		3	
Digital Signal Processing	ER6003	15	6	Year Long		1	
Individual Project	ME6014	30	6	Year Long		1	
Modelling and Simulation in Soft Robotics	ER6006	15	6	TB2		1	

Exit Awards at Level 6

Students exiting the programme without completing the full 120 credits but have successfully completed 60 credits at level 6 or above are eligible for the award of an Ordinary Degree.

E. Teaching, Learning and Assessment

This course uses a range of teaching and assessment methods which have been designed to support students' learning and achievement of the learning outcomes. The course has been developed with reference to the Kingston University Academic Framework which sets-out core principles relating to Course and Credit Structure (including Module delivery Structure and Pattern, and Learning Hours and Learning Formats); Curriculum Design (inclusion Learning Design Principles and Inclusive Curriculum); and Future Skills.

Teaching and Learning on the course consist of Scheduled Learning and Teaching and Guided Independent Study (self-managed time). Scheduled Learning and Teaching includes the following, and the format for each module is set out in the module specification:

- Laboratory Sessions
- Lectures
- Seminars
- Tutorials
- Workshops
- Placements

Guidance for students on the use of independent study time is communicated through the 'Succeed in your module' section on the Canvas Virtual Learning Environment and through other communications during the course.

In addition to the core Scheduled Learning and Teaching activities for the course, the University may offer students additional optional opportunities for learning. Examples of these include Study abroad and Work-based learning.

The course will provide students with the opportunity to develop their knowledge and skills relating to at least two United Nations Sustainable Development Goals (UN SDGs). We are committed to empowering students with the knowledge, skills and opportunities to understand and address the UN SDGs: each course is thus also required to prepare students for at least two of the SDGs (not including Quality Education, which all courses must deliver).

F. Support for Students and their Learning

Students are supported through a range of services that provide academic and wider support. These include:

- A Module Leader for each module
- A Course Leader to help students understand the course structure
- Personal Tutors to provide academic and personal support
- Technical support to advise students on IT and the use of software
- Student Voice Committee – to ensure the views of students are heard
- Canvas – Kingston University's Virtual Learning Environment
- Student support facilities that can provide advice on issues such as finance, regulations, legal matters, accommodation, international student support
- Disabled student support
- Student Development and Graduate Success

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The undergraduate Robotic Engineering and Artificial Intelligence programme has been crafted with Kingston University's Curriculum Design Principles in mind, to cultivate graduates who are not only proficient in their field but also possess a range of valuable qualities such as professionalism, creativity, resilience, proactivity, global awareness, independence, and the ability to learn continuously throughout their lives. By incorporating sustainability into its activities, the programme aims to help prepare graduates to address the pressing environmental and social challenges of our time. The key United Nations Sustainable Development Goals that the programme contributes to include:

Goal 7: Affordable and Clean Energy

Goal 9: Industry, Innovation and Infrastructure

Goal 12: Responsible Consumption and Production

We believe that every student's learning experience is unique, and we strive to provide an inclusive curriculum that acknowledges and accommodates students' circumstances

In this Level 6 top-up programme, students will explore advanced topics such as digital signal processing, dynamics, advanced control, and business management. They will gain a comprehensive understanding of these specialised areas and their applications, with a strong emphasis on developing essential professional, leadership, and management skills. The programme fosters a collaborative group setting where sustainability and ethics play a key role.

are woven into the fabric of the project, as well as fostering independent learning. The programme aims to build on the knowledge acquired in previous levels and

provide a deeper understanding of electrical and electronic engineering, covering topics such as dynamics, artificial intelligence, signal processing and advanced microcontrollers.

The Individual Project module is a culmination of the technical and academic aspects of the programme, offering students a unique opportunity to apply the knowledge and skills they have acquired during the course in a capstone project. This module challenges students to achieve agreed deliverables, while honing their research skills and using technical literature to inform their work. Through this experience, students will gain valuable practical experience and demonstrate their ability to synthesise complex information and apply it to real-world problems.

Research-informed teaching

The academic staff are committed to continuous professional development in teaching and learning in higher education and wider pedagogic issues. Their research and development of innovative ideas informs the curriculum and enhances student learning experience both within and outside the classroom. As part of their pedagogic research, the staff has developed computing resources in fundamental subjects such as mathematics and mechanics, which are embedded in the Virtual Learning Environment (VLE) system. This reflective and evidence-based approach to teaching serves as a model for students to follow in their future professional practice.

Interdisciplinary collaboration

Modules offer further chances for students to interact with and collaborate on real-world problems across different engineering fields. In the Applied Business Management module at Level 6, students consolidate their group working skills by undertaking a group design project within their own engineering discipline, building on the team working skills they have developed in earlier years.

Hands-on practical work

Hands-on practical experience in workshops and laboratories is crucial for developing practical skills and enhancing data collection and analysis abilities. Our curriculum includes practical work closely related to the theoretical content to provide context and reinforce learning. At Level 6, students are expected to select and apply requisite practical skills in their own independent research.

Development of independent learning through the programme

The learning, teaching and assessment strategy of the programme is designed to facilitate students' progression in both curriculum content and skill development as they advance through the different levels of study. As Diploma graduates progress to Level 6, students will assume greater responsibility for their independent study, while

academic staff will play a supervisory role. This is particularly evident in the individual and team project modules.

The VLE at Kingston offers a wide range of TEL resources, including videos, screencasts, online multiple-choice questions (MCQs), discussion boards and interactive teaching packages, to support learning throughout the programme. Additionally, the VLE delivers lecture notes/presentations, problem sets, and worked examples. This inclusive approach allows students to access learning material at their convenience, work through it at their own pace and have the flexibility to pause and rewind as needed.

Assessment for learning

The assessment tasks are designed to be authentic, engaging and transparent, focusing on real-world engineering activities that improve students' employability. The programme employs a variety of assessment methods, including portfolios, quizzes, online tests, in-class tests, practical exercises, tutorial questions and end-of-module examinations. Additionally, all modules have explicit formative assessments to provide opportunities for practice and "feed forward" to help students improve their work for subsequent summative assessments. While examinations remain an effective way to assess basic knowledge and understanding, the strategy recognises that other assessment methods can also be well-suited to assess higher- level problem-solving skills. To reflect on this, a well-balanced range of assessment methods is designed and become a key part of our inclusive assessment strategy, with group and teamwork assessment playing an instrumental role in developing and recognising this essential employability skill.

The programme employs various components to assess the modules including: practical exercises to evaluate students' technical competence and understanding; individual and group-based project work to assess the ability to provide solutions to realistic problems, work effectively in a team, and communicate effectively through written reports, oral presentations or video. Multiple choice or short answer questions are also used to evaluate basic techniques and understanding of concepts, while long answer structured questions in coursework assignments and end-of-module examinations assess the ability to apply learned techniques and provide accurate solutions within a restricted time; the individual project module to assess the ability to plan work, manage time effectively and research background information, culminating in a written report and interview; and finally, individual and group laboratory reports are used to evaluate students' technical competence and ability to work effectively in a laboratory setting.

Inclusive teaching practice

The University is committed to an inclusive curriculum, encouraging students to consider themselves as members of a professional community. The Student Voice Committee provides a platform for students to voice their opinions and suggest improvements for developing a more inclusive curriculum that takes into account the specific circumstances of the student body. To cater to different learning preferences and experiences, a diverse range of teaching activities is provided with a careful balance between individual and group-based activities. The assessment brief,

provided at the beginning of the year, includes marking criteria for all assessments. The language used in the criteria is clear and concise to ensure that students understand the expectations. Additionally, in-class discussions are held to allow students to question and clarify any doubts regarding the marking criteria.

Focus on active learning and enhancing student engagement

The programme emphasises active learning through collaborative, problem- solving and enquiry-based workshops and tutorials. Engaging sessions require students to prepare beforehand and actively participate during the class, as opposed to passively listening to lectures. Furthermore, the guided learning approach encourages students to consolidate their knowledge after the session. Additionally, students can benefit from opportunities for peer learning, group work and presentation practice. In these interactive sessions, the lecturer plays a crucial role in supporting students to construct their own knowledge and understanding while introducing and summarising key concepts through short mini lectures.

Active and collaborative learning techniques are utilised in the lectures, which may include interactive presentation software, question-and-answer sessions and brief student discussions integrated into the lecture. By incorporating these methods, valuable contact time is spent on applying and critically analysing knowledge, while also developing key skills such as problem-solving, communication and teamwork. These efforts also support improved retention and progression among students and enhance student engagement, creativity, confidence and self-reliance.

Development of employability skills

The programme not only focuses on imparting theoretical knowledge but also aims to develop a wide range of essential employability skills. This is achieved by embedding future-oriented skills throughout the curriculum via a personalised development programme called Navigate. Through the Navigate programme, students are equipped with effective communication, problem-solving and creative thinking skills – qualities that employers seek in graduates.

The integration of ‘Skills for Innovation’ across both business and higher education domains ensures that graduates have the skills, experience and opportunities required to excel in their chosen careers.

Throughout the programme, students are encouraged to develop their research skills, which are a fundamental part of the curriculum. Through project work, they can collaborate with research-active staff on live projects. These experiences enable students to determine, distinguish and present appropriate evidence in an argument, which is highly valued by employers. Developing research skills is an essential component of the programme and will equip students with the necessary tools to conduct independent research and contribute to the field of electrical and electronic engineering. By honing their research skills, students will be better equipped to solve complex problems, evaluate data and make informed decisions in their professional careers.

Employability criteria identified using feedback from employers, alumni, Industrial Advisory Board, and the Institution of Engineering and Technology (IET) are embedded in the curriculum. Each module is examined to determine opportunities to incorporate employability skills. To complement the development of employability skills in the curriculum, personal tutors enhance student engagement with employability opportunities by highlighting them within their sessions and encouraging students to participate in a variety of extracurricular activities. These activities may include student representation, part-time work, sports and recreation, society memberships, volunteering, student ambassadorship, leadership and mentoring, cultural and creative activities, academic and professional collaborations, placement opportunities, enterprise activities and events hosted by the PML.

Additionally, the PML aims to host a range of events, such as career fairs where employers promote internship, placement and graduate opportunities, as well as networking activities like spotlight on engineering, which invites employers to discuss career pathways on campus.

G. Ensuring and Enhancing the Quality of the Course

The University has policies and procedures for evaluating and improving the quality and standards of its provision. These include:

- Continuous Monitoring of courses through the Kingston Course Enhancement Programme (KCEP)
- Student evaluation including Module Evaluation Questionnaires (MEQs), the National Student Survey (NSS)
- Internal and external moderation of graded assignments

H. External Reference Points

External reference points which have informed the design of the course. These include:

- PSRB standards
- QAA Subject benchmarks
- Other subject or industry standards

I. Development of Course Learning Outcomes in Modules

This table maps where programme learning outcomes are **summatively** assessed across the **core** modules for this course. It provides an aid to academic staff in understanding how individual modules contribute to the course aims, a means to help students monitor their own learning, personal and professional development as the course progresses and a checklist for quality assurance purposes.

Module Code		Level 6					
		ER6004	ER6006	ME6014	ER6005	EG6026	ER6003
Knowledge & Understanding	A1		S	S	S	S	S
	A2		S	S	S		
	A3			S			
	A4	S	S	S			
	A5			S			
Intellectual Skills	B1		S	S			
	B2	S	S	S		S	S
	B3	S		S		S	S
	B4			S		S	
	B5	S		S		S	S
Practical Skills	C1	S		S			S
	C2	S	S	S			S
	C3		S				S
	C4		S				S
	C5			S			S

Students will be provided with formative assessment opportunities throughout the course to practise and develop their proficiency in the range of assessment methods utilised.

Additional Information