

Mechatronics MEng @UL

Dr Eoin Hinchy

Eoin.Hinchy@ul.ie

Lecturer in Digital Manufacturing and Automation

Course Director PDip & MEng Equipment Systems Engineering

#StudyAtUL



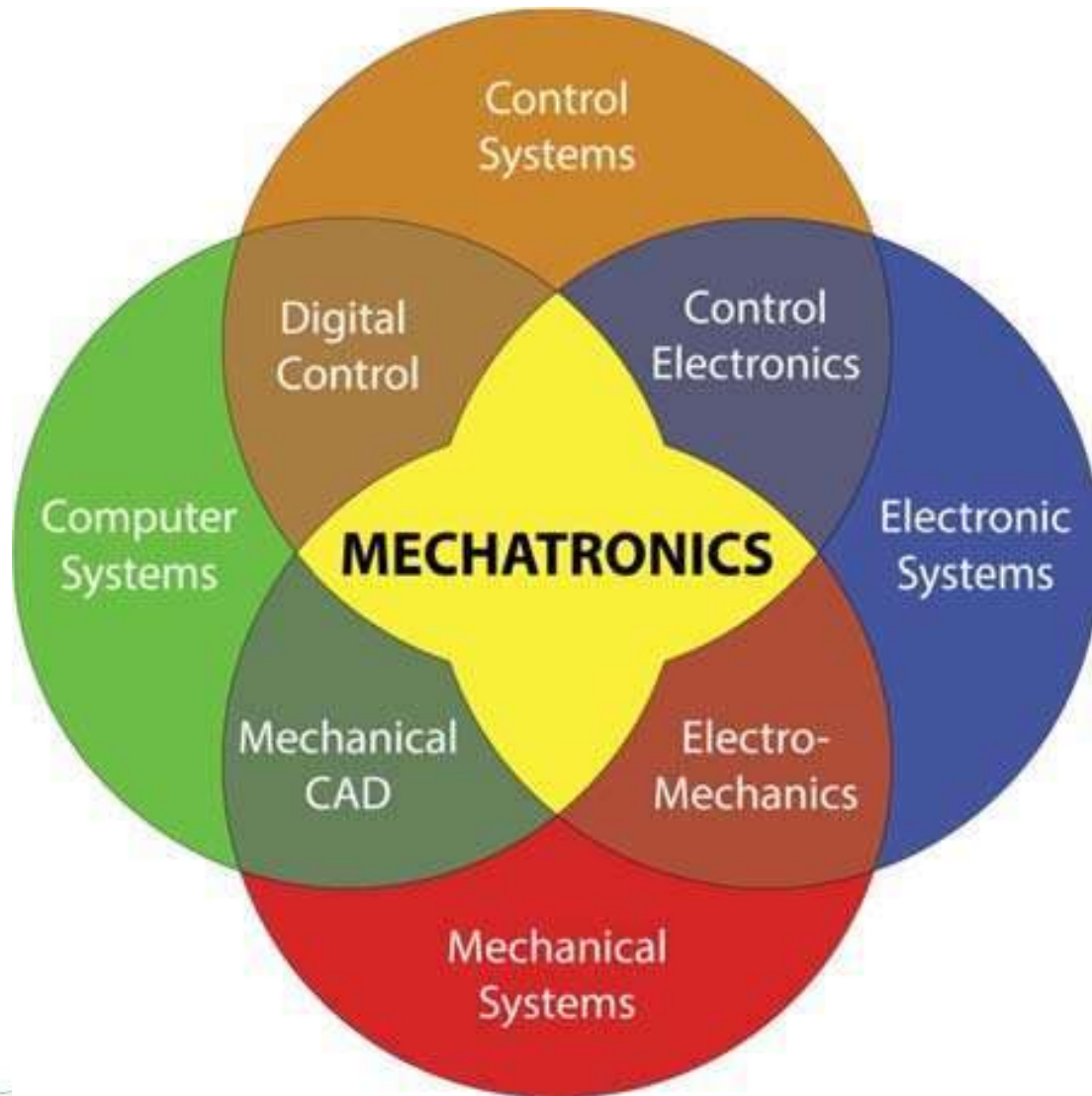
**UNIVERSITY OF
LIMERICK**
OLLSCOIL LUIMNIGH

Limerick & Ireland

- Limerick is Ireland's 3rd largest city, with a population of almost 100,000 in the city centre
- Almost 50% of Limerick's population is under the age of 35 (25,000 of which are students)
- Limerick is a prime base destination from which to explore Ireland
- UL is just 30 minutes from Shannon International Airport (SNN) and 1 hour from Ireland's Wild Atlantic Way



MEng in Mechatronics



UNIVERSITY OF
LIMERICK
OLLSCOIL LUIMNIGH

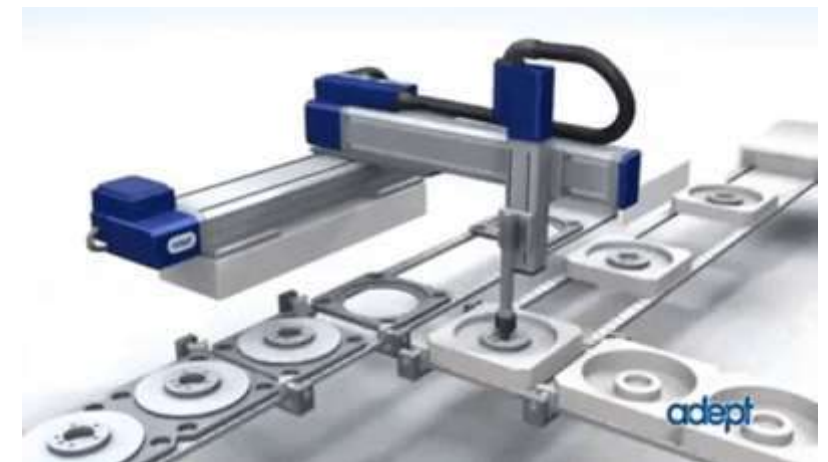


ENGINEERS
IRELAND



MEng in Mechatronics

- Taught Programme over three consecutive semesters
- 90 ECTS
- Designed for Industry 4.0
- Global / Multicultural management part of the core study
- Input from industry professionals on course design and delivery
- Core and Options
 - Software
 - Hardware



MEng in Mechatronics

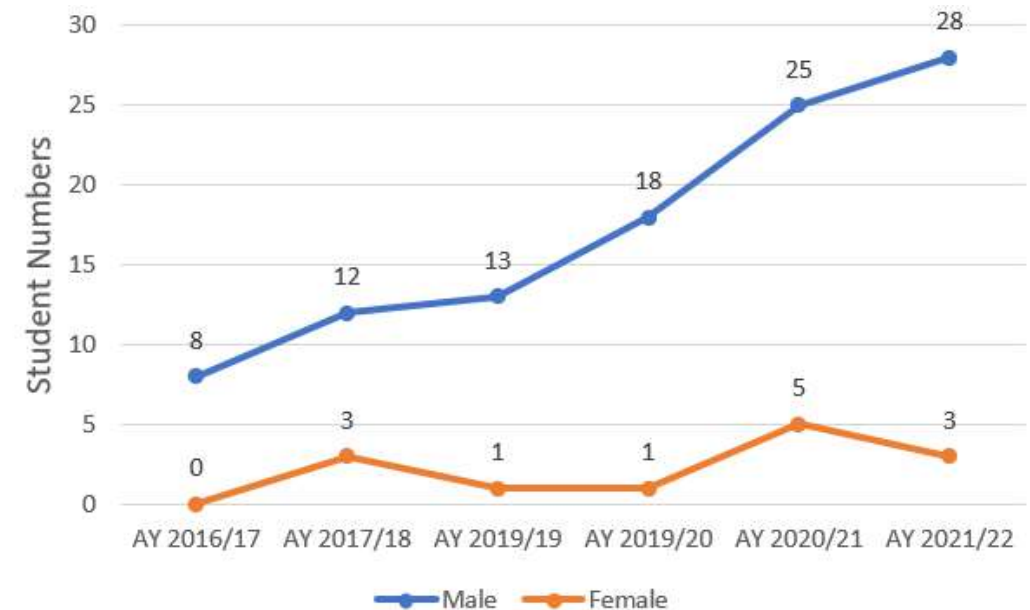
- Industry Experts closely involved in delivery of course
- State of the Art course
- Dedicated Lab with industry standard hardware and software modelling Industry 4.0 manufacturing systems
- Practical student work dealing with real life situations and issues
- Broad Range of knowledge and skills

Johnson & Johnson



SL CONTROLS
THINKING AHEAD

Confirm
Smart Manufacturing

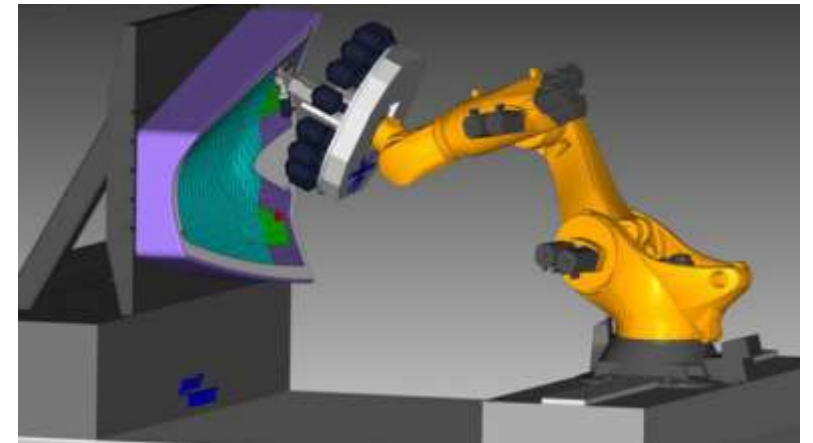
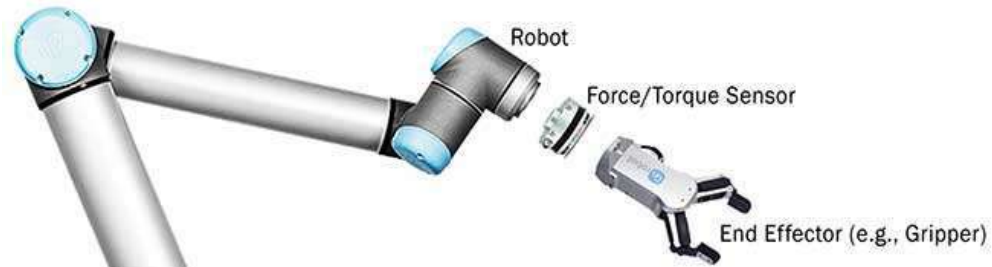


MEng in Mechatronics

	Autumn	Spring	Summer
Core	Low Cost Automation Systems	Mechatronics Project 1	Mechatronics Project 2
	Automated System Design	Digital Control	
	Project Management in Practice	Global Business Strategy	
		Machine Vision	
Path A	Automation	Automation	
	Advanced and Emerging Manufacturing Technology	3D CAD Modelling and Machine Design	
	Automation and Control	System Integration	
Path B	Information Technology	Information Technology	
	Computer Networks 1	Web-Based Applications	
	C++ Programming	Real-Time Systems	

Topics Covered

- 3D CAD & 3D Printing
- Smart Manufacturing
- PLC Programming
- Arduinos
- Sensors
- Motors
- Pneumatics
- Control Systems
- Conveyors
- Robots / Cobots
- ISA88, ISA95



Mechatronics Lab Space



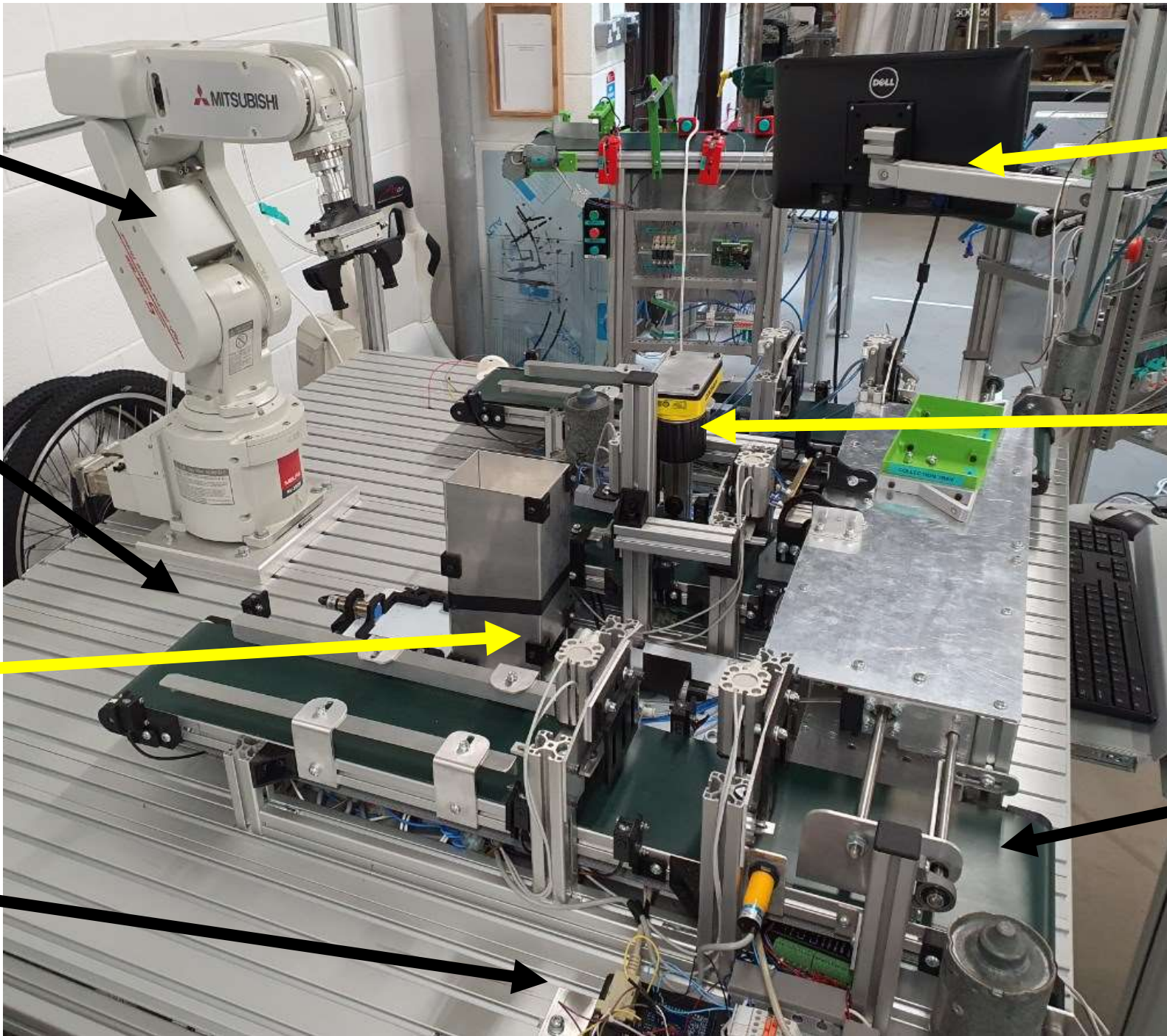


Robot
Programming

PLC
Programming

Pneumatics

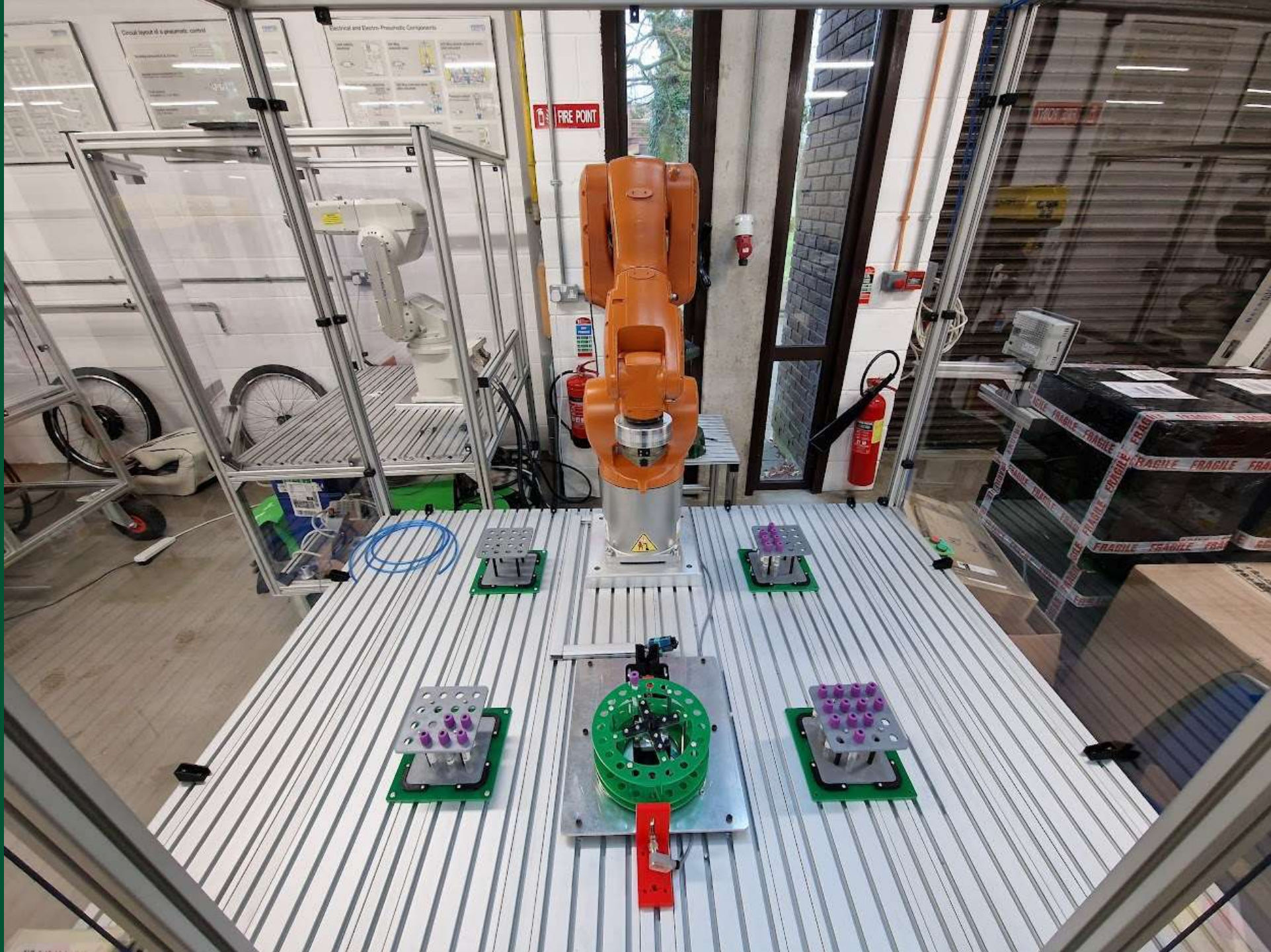
Arduino
Programming



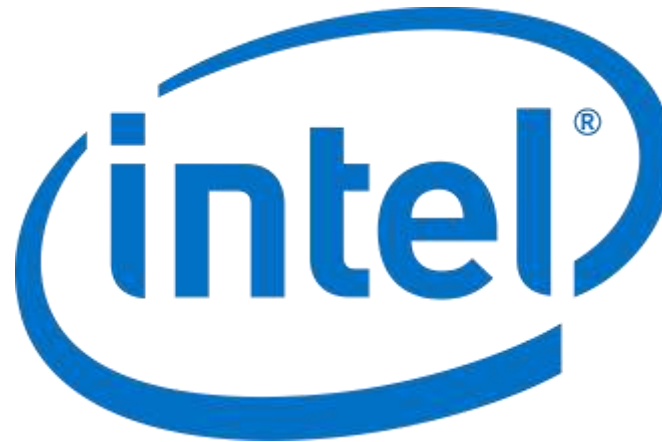
AB Factorytalk HMI
Programming

Cognex
Machine
Vision

Communication
between
controllers



2022 Graduate profiles



- ▶ Integrated BE/ME (4/5 Year, May Finish)
- ▶ Workplace Based (extended 12 Month Co-Op Placement)
- ▶ 270/330 ECTS Credits
- ▶ Common Entry through LM116 (with new elective in Intro to Digital Mechatronic Engineering)
- ▶ Start-of-the Art Labs (Mechatronics M.Eng, UL @ Work, Confirm Centre)
- ▶ Strong links to Industry
- ▶ Strong links to R&D
- ▶ Will seek accreditation through *Engineers Ireland* in due course

Digital Mechatronic Engineering Dedicated Supports

Academic

- ✓ New LAB/LBB in Digital Engineering to cover new modules in 1st & 2nd years, funded until 2025 through UL @ Work, Mainstreamed thereafter – approved by Dean
- ✓ New LAB/LBB in Digital Mechatronics – approved by Dean, will be CD
- ✓ SALI Chair in Digital Engineering

Labs

- ✓ M.Eng Mechatronics labs
- ✓ Purpose built Mechatronic Laboratory facilities on the ground floor of the IBC Building
- ✓ Confirm HQ labs, community of practice area, immersive cave

Admin

- ✓ Significant UL@Work funded support for new workplace based Engineering Programmes
- ✓ UL@Work Instructional Design support for the design and delivery of UL modules in a workplace setting

Digital Mechatronic Engineering (Year 1): LM116 Entry

Semester 1			Semester 2		
Core			Core		
Code	Title	ECTS	Code	Title	ECTS
ME4001	Introduction to Engineering	3	MA4002	Engineering Mathematics 2	6
MA4001	Engineering Mathematics	6	ME4111	Engineering Mechanics 1	6
ME4121	Engineering Science 1	6	ME4412	Fluid Mechanics 1	6
EE4001	Electrical Engineering 1	6	MT4002	Materials 1	6
EE4011	Engineering Computing 1	6	-	<i>Choose One of three Electives Below</i>	
CH4001	Chemistry for Engineers	3			
Electives : None			Electives : Choose 1		
Code	Title	ECTS	Code	Title	ECTS
			ME4042	Introduction To Design For Manufacture	6
			ME4032	Structural Engineering Design	6
			ID: 8002	Introduction to Digital Mechatronics	6

Digital Mechatronic Engineering (Year 2)

Semester 3			Semester 4		
Core			Core		
Code	Title	ECTS	Code	Title	ECTS
MA4003	Engineering Maths 3	6	MA4004	Engineering Maths 4	6
ME4112	Engineering Mechanics 2	6	DM4004	Plant Automation	6
ME4213	Mechanics of Solids 1	6	ME4113	Applied Mechanics	6
ET4013	Communications Networking Fundamentals	6	EE4214	Control 1	6
CE4703	Computer Software 3	6	EE4524	Digital Systems 3	6

Digital Mechatronic Engineering (Year 3 – Std Co-op)

Summer			Semester 5			Semester 6		
Core			Core			Core		
Code	Title	ECTS	Code	Title	ECTS	Code	Title	ECTS
CO4230	COOPERATIVE EDUCATION 1	30	CO4310	COOPERATIVE EDUCATION 2	30	MF4756	Product Design & Modelling	6
						DM4016	Product Automation	6
						EE4044	Communication & Network Protocols	6
						ET4224	Robotics 1: Sensors and Actuators	6
						ID:7979	Introduction to Machine Learning for Engineers	6

Digital Mechatronic Engineering (Year 3 – Extended Co-op)

Summer			Semester 5			Semester 6		
Core			Core			Core		
Code	Title	ECTS	Code	Title	ECTS	Code	Title	ECTS
CO4230	COOPERATIVE EDUCATION 1	30	ID:8194	COOPERATIVE EDUCATION 2A	15	ID:8195	COOPERATIVE EDUCATION 2B	15
			<p>Students on Extended Co-op: The five modules below are taken in blended format to garner 30 ECTS Credits in place of a standard Semester 6</p>					
			Semester 5 (Electives None)			Semester 6 (Electives None)		
			Code	Title	ECTS	Code	Title	ECTS
			ID:8039	Critical Problem Solving*	6	ID:7979	Introduction to Machine Learning for Engineers*	6
			AU5041	Introduction to LEAN Thinking/LEAN Tools*	6	MS6041	Introduction to Quality Science*	6
						ID:8096	Enhanced Placement Engineering Portfolio*	6

* Delivered in a blended format

Digital Mechatronic Engineering (Year 4 : Semester 7)

Core			BE/ME Option (Choose 1)		
Code	Title	ECTS	Code	Title	ECTS
EE4003	The Engineer as a Professional	6	ID:8097	Project 1 Digital Mechatronic Engineering <i>(only if BE path chosen)</i>	6
ET4031	Electrical Automation	6	ET4023	Introduction to Security & Cryptography <i>(only if ME path chosen)</i>	6
CE4051	Intro to Data Engineering & Machine Learning	6			
Streams : Choose 1 Stream					
1. Digital Robotic Engineering			2. Digital Manufacturing Engineering		
Code	Title	ECTS	Code	Title	ECTS
CE4041	Artificial Intelligence	6	DM4017	Simulation Modelling & Analysis	6

Digital Mechatronic Engineering (Year 4 : Semester 8)

Core			Electives : BE/ME Option (Choose 1)		
Code	Title	ECTS	Code	Title	ECTS
RE4002	Spatial Robotics	6	ID:8098	Project 2 Digital Mechatronic Engineering <i>(only if BE path chosen)</i>	6
RE4012	Machine Vision	6	ID:8099	Project 3 Digital Mechatronic Engineering <i>(only if BE path chosen)</i>	6
			IE4248	<i>Project Planning & Control (only if ME path chosen)</i>	6
			EE4042	Master of Engineering Project Preparation <i>(only if ME path chosen)</i>	6
Streams : Choose 1 Stream					
1. Digital Robotic Engineering			2. Digital Manufacturing Engineering		
Code	Title	ECTS	Code	Title	ECTS
EE4216	Control 2	6	DM4006	Engineering Design	6

Digital Mechatronic Engineering (Year 5 : Semester 1)

Core (Semester 1)					
Code	Title	ECTS	Code	Title	ECTS
ID:8100	Research Project 1 (ME Digital Mechatronic Engineering)	9	DM601 1	Automated System Design**	6
ET4021	Electronics Life Cycle Engineering	6	ME605 1	Advanced Technical Communication for Engineers	3
Streams : Choose 1 Stream					
1. Digital Robotic Engineering			2. Digital Manufacturing Engineering		
Code	Title	ECTS	Code	Title	ECTS
CE5002	Computer Vision Systems	6	DM603 1	Automation & Control**	6

****Taught in New Building**

Digital Mechatronic Engineering (Year 5 : Semester 2)

Core (semester 2)					
Code	Title	ECTS	Code	Title	ECTS
ID:810 1	Research Project 2 (ME Digital Mechatronic Engineering)	12	DM602 2	System Integration**	6
EE5052	Robotic Sensing & Perception	6			
Streams : Choose 1 Stream					
1. Digital Robotic Engineering			2. Digital Manufacturing Engineering		
Code	Title	ECTS	Code	Title	ECTS
EE5042	Robotic Planning, Mapping & Manipulation	6	EE6452	Digital Control	6

***Taught in New Building*

Mechatronics MEng @UL

Thank You

Eoin.Hinchy@ul.ie

Lecturer in Digital Manufacturing and Automation

Course Director PDip & MEng Equipment Systems Engineering

#StudyAtUL



**UNIVERSITY OF
LIMERICK**
OLLSCOIL LUIMNIGH