COURSE SPECIFICATION

Course Aim and Title	MSc Mechatronics and Computer Systems Engineering MSc Mechatronics and Computer Systems with Industrial Placement
Intermediate Awards Available	PgCert Mechatronics and Computer Systems Engineering * PgDip Mechatronics and Computer Systems Engineering * PgCert PgDip * See Course Specific Regulations
Teaching Institution(s)	UEL on campus
Alternative Teaching Institutions (for local arrangements see final section of this specification)	N/A
UEL Academic School	Architecture, Computing and Engineering
UCAS Code	
Professional Body Accreditation	N/A
Relevant QAA Benchmark Statements	Engineering (October 2019)
Additional Versions of this Course	PGDip Mechatronics and Computer Systems Engineering* *This version of the course does not include the EG7030 Applied Research and Engineering Practice 1. Students who obtain the necessary credits to be awarded the PgDip may choose to not receive the PgDip but instead move to the MSc route by registering for EG7030.
Date Specification Last Updated	October 2019

Course Aims and Learning Outcomes

The focus of technology related economy is drastically shifting towards autonomous mechatronic systems, automation and robotics, controlled remotely via smart IT systems.

This MSc course combines principles from mechanics, electronics, control, computers, automation and robotics to design, manufacture and test smart and cognitive systems and devices, which utilise a combination of these disciplines. For various applications, these systems and devices are required to interact with objects, know where the objects are, and be able to perform tasks such as moving the objects to a required new position. The electronics require information from sensors that can detect position, orientation, and visual or audio signals. The electrical inputs from the sensors have to be interpreted and the appropriate signals sent out to the actuators to perform the required operation. With embedded artificial intelligence (AI) and machine learning these systems and devices can take on board decision to act as required without human intervention. Students on this postgraduate programme will gain this knowledge of engineering processes, product design, digital electronics, AI and machine learning. This will also enable them to create their own mechatronic systems that are smart and cognitive, developing them from imagination through to reality.

This course is designed to give you the opportunity to:

- Gain a depth of knowledge and understanding of the most up to date practices and theories in Mechatronics and computer systems engineering
- Develop techniques for analysing and solving problems in mechatronics problems, and ways that the computer systems engineering discipline cross-cuts with the mechatronics discipline.
- Understand the role of the engineer as an important professional in society.
- Deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate conclusions clearly to specialist and non- specialist audiences
- Demonstrate self-direction and originality in solving problems, and act autonomously in planning and implementing tasks at a professional level

What you will learn:

Knowledge

- Demonstrate comprehensive and critical understanding of the latest theories and practices in Analysis and Design of mechatronics systems.
- Have a critical understanding of relevant scientific principles of the specialisation.
- Be aware of new and emerging technologies.
- Develop appropriate models for solving problems in engineering, and the ability to assess the limitations of particular cases.
- Collect and analyse research data and using appropriate engineering tools to tackle unfamiliar problems, such as those with uncertain or incomplete data.

Thinking skills

- Appling original thought to the development of practical solutions for mechatronics systems, components or processes.
- Develop a thorough understanding of current practice and its limitations, and some appreciation of likely new developments.
- Develop advanced level knowledge and understanding of a wide range of engineering materials and components.
- Make critical evaluations of risks through some understanding of the basis of such risks.

Subject-Based Practical skills

- Carry out a research project
- Interpret experimental and analysis data
- Use various computer analysis and design packages and develop appropriate models
- Complete design projects and develop appropriate conceptual schemes
- Apply engineering techniques taking account of a range of commercial and industrial constraints

Skills for life and work (general skills)

- Develop interpersonal skills, contribute and work effectively in a team
- Exercise initiative and personal responsibility, which may be as a team member or leader.
- Learn new theories, concepts, methods etc and apply these in unfamiliar situations.
- Develop, monitor and update a plan, to reflect a changing operating environment.
- Learn independently and effectively; and to be able to present and convey complex technical information to other professionals and the public both verbally and in writing

Learning and Teaching

Knowledge is developed through

- Lectures
- Tutorials
- Seminars

Thinking skills are developed through

- Coursework
- Mini projects

- Research dissertation

Practical skills are developed through

- Laboratory experiments
- Design projects
- Planning of work required for the research dissertation
- Industrial placements, as appropriate

Skills for life and work (general skills) are developed through

- Seminars
- Coursework
- Presentation of research
- Research dissertation

In addition, the industrial placement will provide opportunities to apply key technical knowledge and skills learnt in the taught modules, enhance their communication and interpersonal skills and improve their employment potential.

Assessment

Knowledge is assessed by:

- Coursework
- Examinations
- Research dissertation

Thinking skills are assessed by:

- Solutions to practical problems
- Evaluation of literature
- Evaluation of experimental data

Practical skills are assessed by:

- Use of design aids
- Use of computer aided design packages
- Laboratory experiments
- Preparation of research dissertation

Skills for life are assessed by:

- Seminars
- Design drawings
- Research dissertation

- Oral examinations

Students with disabilities and/or particular learning needs should discuss assessments with the Course Leader to ensure they are able to fully engage with all assessment within the course.

Work or Study Placements

Students on the placement version of the course will undertake an internship within a partner organisation and complete a 120 P-credit Industrial Placement Module. The module is graded at either Pass or Fail, assessed by the partner industrial organisation and the University and grades reflected on the students' academic transcripts.

The industrial placement component is for a duration of an academic year, ie, normally 30 weeks including minimum 24 weeks of delivery time. It starts after students have completed the 1st year of study, ie, all the taught modules and the dissertation component of the MSc course which together form 180 credits.

Students on the two-year MSc with placement courses must pass all taught modules of their respective course plus dissertation, ie, 180 credits, before they become eligible to progress to the next stage and undertake industrial placement.

Students on the MSc course with placement will also normally be required to fulfil the 80% attendance requirement (on all modules) to be eligible to progress to the industrial placement module.

Students unable to meet the above requirements and progress successfully will normally be moved to the one-year full-time version of the course and their student visa, if any, will be curtailed accordingly.

The structure of the extended version of the MSc courses that includes the industrial placement is summarised in the following table:

For September intake:	
Term 1 (Y1: Sep – Jan)	Taught modules
Term 2 (Y1: Jan – May)	Taught modules
Term 3 (Y1: May – Sep)	Dissertation
End of July Y1	Deadline for confirming placement
Term 1 and 2 (Y2: Sep – May)	Industrial placement
For January intake:	
Term 2 (Y1: Jan – May)	Taught modules
Term 1 (Y1: Sep – Jan)	Taught modules
Term 2 (Y1: Jan – May)	Dissertation
End of March	Deadline for confirming placement
Term 3 and 1 (Y2: May – Jan)	Industrial placement

Students must check the Academic Calendar for start and end of term dates.
It is ultimately the student's responsibility to secure their placement. The University through the Centre for Student Success and the School will offer guidance and support; and recommend students to our industrial partners who are interested in participating in the course. But the onus to find and secure the placement is on the students. If they are unable to secure a placement at the end of taught modules, they will be transferred back to the full time taught course without the placement component and your student visa, if applicable, will be curtailed accordingly by UKVI.

Students undertaking the Placement Module will also normally need to meet the following requirements:

- 80% attendance at the 12 week employability module workshops and classes.
- Registration on the UEL Employment Hub with CV and Covering Letter uploaded.
- Details of placement provided to the Placement Officer by 31st July (Sept starters) and 31st March (January starters).
- Placement Agreement form signed by the student and partner organisation at least 3 weeks before the placement start date.

Course Structure

All courses are credit-rated to help you to understand the amount and level of study that is needed.

One credit is equal to 10 hours of directed study time (this includes everything you do e.g. lecture, seminar and private study).

Credits are assigned to one of 5 levels:

3	Equivalent in standard to GCE 'A' level and is intended to prepare students for year one of an undergraduate degree course.
4	Equivalent in standard to the first year of a full-time undergraduate degree course.
5	Equivalent in standard to the second year of a full-time undergraduate degree course.
6	Equivalent in standard to the third year of a full-time undergraduate degree course.
7	Equivalent in standard to a Masters degree.

Courses are made up of modules that are each credit weighted.

The module structure of this course:

Level	Module Code	Module Title	Credit Weighting	Core/Option	Available by Distance

					Learning ? **Y/N**
7	EG7060	Mental Wealth: Professional Life	30	Core	N
7	EG7031	Intelligent Transport Systems	30	Option	N
7	EG7061	Wireless Signal Propagations	30	Option	N
7	CD7030	Machine learning on Big Data	30	Core	N
7	EG7164	Automation and Robotics	30	Option	N
7	EG7039	Smart industries and digital manufacturing	30	Option	N
7	EG7030	Applied Research and Engineering Practice 1	60	Core*	N
7	EG7021	Industrial Placement	120P	Core for MSc with Industrial Placement	N

Please note: Optional modules might not run every year, the course team will decide on an annual basis which options will be running, based on student demand and academic factors, in order to create the best learning experience.

Additional detail about the course module structure:

*Applied Research module is not available for PGDip course.

A core module for a course is a module which a student must have passed (i.e. been awarded credit) in order to achieve the relevant named award. An optional module for a course is a module selected from a range of modules available on the course.

The overall credit-rating of the Masters course (not including the industrial placement) is 180 credits. For PGDip courses, it is 120 credits. If for some reason you are unable to achieve this credit you may be entitled to an intermediate award,

the level of the award will depend on the amount of credit you have accumulated. You can read the University Student Policies and Regulations on the UEL website.

Course Specific Regulations

* It will be at discretion of the Assessment Board whether Intermediate Awards are named or unnamed.

Typical Duration

For those not on a student visa, it is possible to move from full-time to part-time study and vice-versa to accommodate any external factors such as financial constraints or domestic commitments. Many of our students make use of this flexibility and this may impact on the overall duration of their study period.

Course without industrial placement

The duration of this course is one calendar year full-time if enrolment is in September, and two calendar years part-time. For January enrolment, the duration becomes 15 months full time, and 27 months part-time. The full-time structure is summarised in the following Table.

For September intake:	
Term 1 (Y1: Sep – Jan)	Taught modules
Term 2 (Y1: Jan – May)	Taught modules
Term 3 (Y1: May – Sep)	Dissertation
For January intake:	
Term 2 (Y1: Jan – May)	Taught modules
Term 1 (Y1: Sep – Jan)	Taught modules
Term 2 (Y2: Jan – May)	Dissertation

Course with industrial placement

The course with industrial placement is offered in full-time mode only. The duration of this course is two academic years (including the industrial placement element). See “Work or Study Placements” section for more detail.

The time limit for completion of a course is four years after first enrolment on the course.

Further Information

More information about this course is available from:

- The UEL web site (www.uel.ac.uk)
- The course handbook
- Module study guides
- UEL Manual of General Regulations (available on the UEL website)
- UEL Quality Manual (available on the UEL website)
- School web pages

• The Employability HUB All UEL courses are subject to thorough course approval procedures before we allow them to commence. We also constantly monitor, review and enhance our courses by listening to student and employer views and the views of external examiners and advisors.
Additional costs: None

Alternative Locations of Delivery

N/A