

## PROGRAMME SPECIFICATION

Programme Aim and Title	BEng (Hons) Mechatronics and Automation Engineering
Intermediate Awards Available	Ordinary, DipHe, CertHE, University Certificate
Teaching Institution(s)	Ain Shams University - Faculty of Engineering, Cairo, Egypt
Alternative Teaching Institutions (for local arrangements see final section of this specification)	N/A
UEL Academic School	School of Architecture, Computing and Engineering
UCAS Code	N/A
Professional Body Accreditation	N/A
Relevant QAA Benchmark Statements	Engineering (February 2015)
Additional Versions of this Programme	N/A
Date Specification Last Updated	August 2019

### Programme Aims and Learning Outcomes

This programme is designed to give you the opportunity to:

- Enrich the basic theoretical and practical knowledge of mechatronic system components, and design methodologies of mechatronic systems.
- Develop the ability to use the state-of-the-art technologies to find affordable, reliable and innovative solutions for mechatronics issues to improve our daily quality of life.
- Develop work within a multidisciplinary team during the analysis, design and implementation phases of mechatronics engineering projects, while applying ethical standards and environmental considerations.
- Develop knowledge and research skills to create innovative mechatronic solutions having direct impact on industrial, commercial, and social scales
- Specialised in four different fields. These four fields are: Autotronics, Nanomechatronics, Industrial Automation, and Bio-mechatronics.

#### **What you will learn:**

This programme has been developed in accordance with the QAA Subject Benchmark for Engineering and the Framework for Higher Education Qualifications.

The graduates of the Mechatronics and Automation engineering Programme should be able to demonstrate:

### Knowledge

- Concepts and theories of mathematics, sciences, engineering projection and their applications within the field of mechatronics engineering.
- Principles and theories relevant to mechanical, electrical, electronic engineering, and manufacturing technologies.
- The principles of sustainable design and development within the field of mechatronics engineering and its disciplines
- Contemporary engineering technologies and issues in the specialization field (industrial automation, autotronic, nano-mechatronic, or biomechatronic systems).
- The hardware, software and networks of computer systems used in industry related to the specialization field (industrial automation, autotronic, nano-mechatronic, or biomechatronic systems)

### Thinking skills

- Develop mechanical, electrical, electronic, programming and communication elements necessary for the development of mechatronic systems.
- Analyze and design new mechatronic systems or processes through the synthesis of creative and innovative ideas pulled in from a wide range of sources.
- Apply the different theories and identify the working principles of the different devices and systems to solve problems related to the specialization field (industrial automation, autotronic, nanomechatronic, or biomechatronic systems)
- Judge engineering decisions considering balanced costs, benefits, safety, quality, reliability, and environmental impact.

### Subject-Based Practical skills

- Professionally merge the engineering knowledge, understanding, and feedback to improve design, products and/or services.
- Create and/or re-design a process, component or system, and carry out specialized engineering designs.
- Practice the neatness and aesthetics in design and approach.
- Use computational facilities and techniques, measuring instruments, workshops and laboratory equipment to design experiments, collect, analyse and interpret results.

### Skills for life and work (general skills)

- Collaborate effectively within multidisciplinary teams.
- Work in stressful environment and within constraints.
- Demonstrate efficient IT capabilities.
- Effectively manage tasks, time, and resources.

## Learning and Teaching

Knowledge is developed through

- General and directed reading
- Participation in lectures and tutorial
- Directed research

Thinking skills are developed through

- Reflective activities with feedback
- Successfully completion of home assignments
- Seminar discussions and activities
- Solve problems in tutorials

Practical skills are developed through

- IT activities with feedback
- Research skills-based activities with feedback
- Experiments in Labs
- Case studies.

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

- Project work
- Working in a team
- Submitting and discussing presentations
- Managing time and resources to finish task in time

## Assessment

The assessment strategy reflects the Learning and Teaching methodologies and the learning outcomes,

Knowledge is assessed by

- Coursework
- Essays
- Examinations

Thinking skills are assessed by

- Coursework
- Examinations
- Project work

Practical skills are assessed by

- Practical reports
- Portfolio completion
- Feedback on laboratory work linked with the taught modules

Skills for life and work (general skills) are assessed by

- Project work (ability to manage time and resources before the deadline)
- Group work (ability to work in a team and evidence of group working)

- Presentation skills in presenting the work

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

## Work or Study Placements

Although there is no compulsory placement system we encourage all students to seek work experience during their during the summer vacations. Training could be performed in an industrial/service facility related to the student's program, and must be under the full supervision of the faculty according to the requirements stipulated in Article (37) of the ASU Credit-hour Educational Programmes bylaws. The training is mandatory for the normal ASU degree.

## Programme Structure

All programmes 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).

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

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

The module structure of this programme:

Level	UEL Module Code	ASU Module Code	Module title	Credit Weighting	Core/ Option	Available by Distance Learning? Y/N
3	EG3XXX	EG8311	Applied Mathematics and Mechanics	30	Core	N
3	EG3XXX	EG8312	Mechanical Engineering Basics	30	Core	N

3	EG3XXX	EG8313	Circuit Analysis and Programming	30	Core	N
3	EG3XXX	EG8314	Design and Manufacturing Fundamentals	30	Core	N
4	EG4XXX	EG8421	Modelling and Control	30	Core	N
4	EG4XXX	EG8422	Machine Design	30	Core	N
4	EG4XXX	EG8423	Digital Electronics and Programming	30	Core	N
4	EG4XXX	EG8424	Measurements and Instrumentation	30	Core	N
5	EG5XXX	EG8531	Mechatronic Applications	30	Core	N
5	EG5XXX	EG8532	Embedded Systems	30	Core	N
5	EG5XXX	EG8533	Mechatronic Systems Design	30	Core	N
5	EG5XXX	EG8534	Advanced Manufacturing and Automation	15	Core	N
Nano-Mechatronics Track						
5	EG5XXX	EG8535	Nano-Mechatronics (1)	15	Option	N
Autotronics Track						
5	EG5XXX	EG8536	Autotronics (1)	15	Option	N
Bio-Mechatronics Track						
5	EG5XXX	EG8537	Bio-Mechatronics (1)	15	Option	N
Industrial Mechatronics Track						
5	EG5XXX	EG8538	Industrial Mechatronics (1)	15	Option	N
6	EG6XXX	EG8641	Team Project	30	Core	N
6	EG6XXX	EG8642	Advanced and Intelligent Machines	30	Core	N
6	EG6XXX	EG8643	Professional Skills	30	Core	N
Industrial Mechatronics Track						
6	EG6XXX	EG8644	Industrial Mechatronics (2)	30	Option	N
Nano-Mechatronics Track						
6	EG6XXX	EG8645	Bio-Mechatronics (2)	30	Option	N
Bio-Mechatronics Track						
6	EG6XXX	EG8646	Nano-Mechatronics (2)	30	Option	N
Autotronics Track						
6	EG6XXX	EG8647	Autotronics (2)	30	Option	N

*Please note: Optional modules might not run every year, the programme 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 details about the programme module structure:

A core module for a programme 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 programme is a module selected from a range of modules available on the programme.

The overall credit-rating of this programme is 480 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.

## Programme Specific Regulations

This is a double award programme leading to the award of both a UEL and ASU qualification. Each institution shall be responsible for the issuing of the award certificate of that institution.

## Typical Duration

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.

The expected duration of this programme is 4 years full-time or 8 years part-time.

A student cannot normally continue study on a programme after 4 years of study in full time mode unless exceptional circumstances apply and extenuation has been granted. The limit for completion of a programme in part time mode is 8 years from first enrolment.

## Further Information

More information about this programme is available from:

- The UEL web site ([www.uel.ac.uk](http://www.uel.ac.uk))
- The programme 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
- FoE-ASU website (<https://eng.asu.edu.eg/UEL>)

All UEL programmes are subject to thorough programme approval procedures before we allow them to commence. We also constantly monitor, review and enhance our programmes by listening to student and employer views and the views of external examiners and advisors.

Additional costs:

- Late registration is not final unless there is a vacancy in the courses, and the student should pay late registration fees. It is an administrative fee added and decided by the Credit hour programmes board and should not exceed the fees of a one credit hour, which for the academic year 2019/20 is 1500 L.E.

Alternative Locations of Delivery

N/A