

# 1 Programme Specification Document

1. Qualification	2. Programme Title	3. UCAS Code	4. Programme Type
Master Degree	<p style="text-align: center;"><b>MSc in Systems Engineering (pathway) and Engineering Management</b></p> <p style="text-align: center;"><b>Pathways offered are:</b>  <b>Electronic</b>  <b>Mechanical</b>  <b>Mechatronic</b></p>	Not Applicable	<p><b>Full time options:</b></p> <p><b>single campus attendance and single MSc award</b></p> <p><b>dual campus attendance and dual MSc award</b></p>

## 5. Main Purposes and Distinctive Features of the Programme

The programme is an integrated MSc and builds on an established MSc in Electronic Systems and Engineering Management that has run successfully for 10 years prior to this MSc in Systems Engineering and Engineering Management. Electronics remains as a pathway option in the new structure and remains largely unchanged.

The MSc in Systems Engineering and Engineering Management extends the structure of the successful MSc in Electronic Systems and Engineering Management and applies it to another subject discipline i.e. mechanical engineering, this a pathway option.

Additionally the integration of electronic and mechanical engineering is addressed in the provision of another pathway mechatronic.

The MSc in Systems Engineering (pathway name) and Engineering Management thus has three pathways these are Electronic, Mechanical or Mechatronic. The programme also has two delivery options:

- (i) a dual-award option which in part will be delivered by both universities and will require that the student studies at least one semester at both universities.
- (ii) a single award option this can be delivered by either university, in this option the student will study wholly at only one university.

The course is a three semester course starting normally in October and with a summer interval (break).

The course structure has four subject based components these are:

- control systems;
- management systems;
- an engineering subject discipline;
- a project based on the pathway.

Only the engineering subject discipline differentiates the taught elements of the course, the other components are common to all pathways. The engineering discipline bears the pathway name.

In the dual award option which is expected to be the majority option. The students will be recruited by both universities.

**Distinctive features:**

- Integrated course using the systems approach
- Three pathways available
- Common systems modules available on all pathways
- Dual and single campus overseas delivery available
- Course model can be expanded to include other appropriate pathways if needed
- Can result in efficiencies of delivery and synergies.

**The primary aims of the course is to provide:**

- advanced education in systems engineering and management at postgraduate level;
- subject updating in modern methods and technologies;
- the continuing education needs of practising engineers and engineering managers.

**The objectives of the programme is to provide for students:**

- an in-depth understanding of systems engineering, management methods and techniques;
- to have the ability to solve advanced problems in systems engineering;
- to be provided with the knowledge and skills in management to advance their careers;
- to have the ability to communicate clearly in speech, writing and using appropriate mathematics and software;
- to have an appreciation of current developments in associated technologies and techniques;
- to develop communication skills, both oral and written;
- to have a familiarity with appropriate CAD tools;
- to have an appreciation of the need for continuing professional development.

Students will be recruited to the course by both collaborating universities the operational delivery of the course will be decided by agreement with the staff of the two universities.

The modules available for delivery on the course are given the table below.

Module name	MSc Systems Engineering (Electronic) and Engineering Management	MSc Systems Engineering (Mechanical) and Engineering Management	MSc Systems Engineering (Mechatronic) and Engineering Management	CATS Credits (ECTS Credits)
<b>Control:</b>				
Intelligent systems EEM4010	✓	✓	✓	15(8)
Advanced Control Technology EEM4015	✓	✓	✓	15(8)
<b>Management:</b>				
Business in Engineering EEM4013	✓	✓	✓	15(7)
Technical Publications and Presentations EEM4014	✓	✓	✓	15(7)
Project Management EEM4017	✓	✓	✓	15(7)
Integrated Management EEM4020	✓	✓	✓	15(7)
<b>Electronic Subject Modules:</b>				
Microprocessor-based Systems EEM4016 or Microcontrollers AMI4655	✓		✓	EEM4016 = 15(8) AMI4655 = 20(10)
Signal Processing EEM4011 or Digital Signal Processing AMI4622	✓			EEM4011 =15(8) AMI4622 =15(8)
<b>Mechanical Subject Modules:</b>				
Monitoring of Mechanical Systems EEM4018		✓		15(8)
Advanced Production Engineering EEM4019		✓	✓	15(8)
Project EEM5001	✓	✓	✓	60(30)

## **6. What a postgraduate should know and be able to do on completion of the programme**

Further details of module outcomes can be found in the programme document

### **Knowledge and understanding in the context of the subject(s)**

- K1** A critical understanding of the application of advanced control engineering concepts and design methodologies for application in the design of mechanical based equipment
- K2** Application knowledge of digital signal processing for the processing of measurement signals used in control applications
- K3** Knowledge of advanced artificial intelligence techniques and in particular the use of expert systems for applications in the design and control of automated machinery
- K4** A critical understanding of the role of total quality management in design, manufacture and project management
- K5** A critical understanding of commercial aspects of project management involving the negotiation of contracts, quotation, procurement of orders and other financial and legal matters.

### **Cognitive skills in the context of the subject(s)**

- C1** The ability to realise a functional control system through a microprocessor or microcontroller based system
- C2** To have an in-depth understanding of Systems Engineering and Management Methods and Techniques
- C3** To have the ability to solve advanced problems in Systems Engineering
- C4** The ability to solve advanced and challenging engineering problems in electronic system design

### **Subject-specific practical/professional skills**

- P1** Familiarity with appropriate new software tools
- P2** The skills to manage complete systems project from concept through to implementation
- P3** To have an appreciation of current developments in associated technologies and techniques
- P4** To have the ability to communicate clearly in speech, writing and using appropriate mathematics and software

### **Other skills (e.g. key/transferable) developed in subject or other contexts**

- S1** To be provided with the knowledge and skills in management to advance their careers
- S2** An appreciation of the need for continuing professional development
- S3** Communication skills, both oral and written
- S4** The ability of students to take successfully part in research projects for MPhil or PhD degrees
- S5** Time management

<b>Module Name</b>	<b>Module Number</b>	<b>Knowledge and understanding</b>	<b>Cognitive skills</b>	<b>Practical and professional skills</b>	<b>Other skills</b>
<b>Control:</b>					
Intelligent Systems	EEM4010	K1, K3	C2, C3	P1, P2, P3	S3, S5
Advanced Control Technology	EEM4015	K1, K3	C2, C3	P1, P2, P3	S3, S5
<b>Management:</b>					
Business in Engineering	EEM4013	K4, K5	C3	P1, P2, P3	S1, S3, S5
Technical Publications and Presentations	EEM4014	K4, K5	C3, C4	P1, P3	S1, S2, S3, S4, S5
Project Management	EEM4017	K4, K5	C3, C4	P1, P2	S1, S2, S3, S4, S5
Integrated Management Systems	EEM4020	K4, K5	C3	P1, P2	S1, S3, S5
<b>Electronic Subject Modules:</b>					
Microprocessor Based Systems or Microcontrollers	EEM4016 or AMI4655	K3	C1, C2	P1, P2, P3	S3, S5
Signal Processing or Digital Signal Processing	EEM4011 or AMI4622	K2	C4	P1, P2, P3	S3
<b>Mechanical Subject Modules:</b>					
Monitoring of Mechanical Systems	EEM4018	K2	C4	P1, P2, P3	S3
Advanced Production Engineering	EEM4019	K3	C1, C2	P1, P2, P3	S3, S5
Project	EEM5001	K1, K2, K3, K4, K5	C1,C2, C3, C4	P1, P2, P3, P4	S1, S2, S3, S4, S5

<b>7. Qualities, Skills &amp; Capabilities Profile</b>			
<b>A Cognitive</b>	<b>B Practical</b>	<b>C Personal &amp; Social</b>	<b>D Other</b>
Problem structuring and solving	Research skills and methods	Self-development Self-confidence	Career development
Critical reasoning and analysis	Presentational skills	Team-working and networking skills	
Apply and Transfer learning and experience	Information search	Time management	
Handle complexity and intellectually synthesise		Communications	
Develop theoretical frameworks from observation, practice and experience			

<b>8. Duration and Structure of Programme/Modes of Study/Credit Volume of Study Units</b>		
<u>Core Modules</u>		<u>Output</u>
Semester 3	MSc Project	180 Credits - MSc
Semester 2	Microprocessor based systems Project Management Signal Processing Integrated Management	120 Credits - Postgraduate Diploma
Semester 1	Advanced Control Technology Intelligent Systems Technical Publications and Presentations Business in Engineering	60 Credits – Postgraduate Certificate

## 9. Learning, Teaching and Assessment

Students will benefit from a variety of teaching methods including case studies, discussions, lectures, tutorials, demonstrations and computer-aided learning sessions. They will be expected to be independent, self-motivated and an active learner and will be given strong guidance to help them achieve this.

The project will be the primary vehicle for the integration of the practical and theoretical parts of the course. The project constitutes one third of the total marks and is jointly assessed by the supervisor and an external supervisor.

### 9.1 Module Assessment Strategy

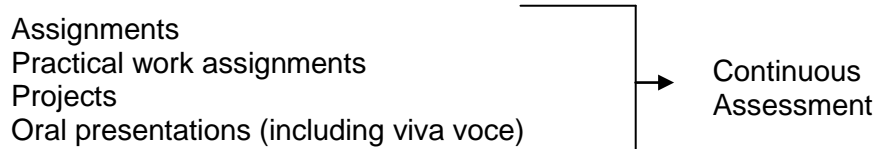
Module Number	Year of Course	Level	Pre Requisites	Assessment (Percentage Weighting)	
				CA	EXAM
EEM4010	1	HE7	-	50	50
EEM4011	1	HE7	-	50	50
EEM4013	1	HE7	-	100	
EEM4014	1	HE7	-	100	
EEM4015	1	HE7	-	50	50
EEM4016	1	HE7	-	50	50
EEM4017	1	HE7	-	100	
EEM4018	1	HE7	-	50	50
EEM4019	1	HE7	-	100	
EEM4020	1	HE7	-	100	
EEM5001	1 / 2	HE7	-	100	
AMI4655	1	HE7	-	100	
AMI4622	1	HE7	-	100	

#### Assessment Key

CA = Coursework Assessment including written assignments and in-class assessment

EXAM = formal written examination (end test)

Each module on the MSc Systems and Engineering (pathway) and Engineering Management programme involves several assessments staged throughout the module delivery period. The results of these assessments will contribute towards your final grade for the module. The assessments can take a variety of forms but typically fall into the following broad groups:



Formal end examination – which is normally a 2 hour examination.

### **Assessment Classification System**

<b>Grade Description</b>		<b>Mark</b>
Work of Exceptional Quality	High	80+
	Middle	75-79
	Low	70-74
Work of Very Good Quality	High	67-69
	Middle	64-66
	Low	60-63
Work of Good Quality	High	57-59
	Middle	54-56
	Low	50-53
Work of Satisfactory Quality	High	47-49
	Middle	44-46
	Low	40-43
Unsatisfactory Performance (Fail)	Borderline Fail	35-39
	Clear Fail	below 35

Pass mark for examination and assignments is 40%

### **Date programme first offered**

October 2008 single award  
February 2009 dual award

### **Admissions Criteria**

#### *Standard Requirements*

Degree, or equivalent

Dip-Ing in Electrical or Mechanical Engineering

As MSc taught in English, proof of adequate knowledge (TOEFL 550)

### **Indicators of Quality and Standards**

- i) Validated by panel with external academic subject specialists
- ii) External examiners moderate assignments and projects

## **10. Progression and Award Criteria**

### **Postgraduate Certificate**

In order to satisfy the requirements for successful completion of the Postgraduate Certificate you must obtain at least 60 credits, where appropriate including a specified maximum number of credits at Level HE6 the remainder being at level HE7.



You will normally need to pass all modules required for the Postgraduate Certificate before being allowed to proceed formally to the Postgraduate Diploma. You also must pass any Postgraduate Certificate pre-requisite module(s) before proceeding to study the related module(s) at the Postgraduate Diploma stage.

### **Postgraduate Diploma**

In order to satisfy the requirements for the award of the Postgraduate Diploma you must obtain at least 120 credits, where appropriate including a specified maximum number of credits at Level H the remainder being at Level M.

You will normally be required to pass all modules required for the Postgraduate Diploma before being allowed to proceed formally to the dissertation stage of your programme. If the programme includes a module which is a pre-requisite for the dissertation (for example a Research Methods module) this must be passed before the dissertation is started.

### **Masters Degree**

In order to satisfy the requirements for the award of a Masters Degree, you must obtain at least 180 credits, where appropriate including a specified maximum number of credits at Level HE6, the remainder being at Level HE7, and including a significant element of advanced independent study in the form of a dissertation worth 60 credits at Level HE7. Successful students will be awarded a Masters Degree.

You may be considered for the award of Masters Degree with Distinction if (a) the overall average mark for the taught modules and dissertation/project contributing to the required 180 credits normally is at least 70% and (b) the dissertation/ project mark is normally at least 70%.