Aston University

PROGRAMME SPECIFICATION
(2012-13)

Programme Title	Electromechanical Engineering
UCAS/JACS Code	HH36
School/Subject Area	Engineering & Applied Science Mechanical Engineering and Design
Final Award	BEng (Hons)
Interim Awards	Certificate of Higher Education (120 credits) Diploma of Higher Education (240 credits)
Mode(s) of Study	Full-time and Sandwich
Normal Length of Program	3 years Full-time, 4 years sandwich
Total Credits	360 Full-time (plus 120 at level P for sandwich students)
Programme Accredited By	The Institution of Mechanical Engineers.
Dates Program Specification Written and Revised	February 2010, April 2011

Education Aims of the Programme	• To provide students with the opportunities to realise their academic potential through a range of learning experiences. • To encourage, through a practical approach, the student to have a passion for engineering and an enthusiasm for learning. • To provide a thorough grounding in the principles and practice of Mechanical Engineering and including relevant aspects of Societal and Commercial matters. • To provide students with appropriately structured curricula, combining teaching and learning in theoretical issues with practical skills training. • To provide an up-to-date and professionally focussed curriculum satisfying the accreditation requirements of the Institution of Mechanical Engineers. • To offer students the opportunity to obtain relevant industrial experience by providing the option of a sandwich placement year. • To produce capable graduate engineers who are highly valued by employers.
Relevent Subject Benchmark Statements and other External and Internal Reference Points used to inform programme outcomes	Quality Assurance Agency General Engineering benchmark statements. Institution of Mechanical Engineers Educational Base document. Framework for Higher Education Qualifications. CDIO (Conceive, Design, Implement & Operate) Framework

Programme Structures and Requirements: Levels, Modules and Credits Stage 1				
Module Title	**Credits**	**Level**	**Module Code**	**Core**
Design and Experimentation	30	4	ME1501	YES
Prototyping and Development	30	4	ME1502	YES
Electronic Engineering Foundations	20	4	ME1600	YES
Engineering Science	20	4	ME1601	YES
Transistion Mathematics for Engineers	10	4	SE11EM	YES
Mathematics for First Year Engineers	10	4	SE12EM	YES
TOTAL	120			

Programme Structures and Requirements: Levels, Modules and Credits Stage 2				
Module Title	**Credits**	**Level**	**Module Code**	**Core**
Engineering Mathematics	10	4	AM21EM	YES
Introduction to Electrical Power	10	4	EE1ELE	YES
Thermodynamics and Fluid Mechanics	10	5	ME2011	YES
Engineering Materials 1	10	5	ME2019	YES
Solid Mechanics	10	5	ME2045	YES
Dynamics and Control Systems	10	5	ME2050	YES
Design and Engineering for the User	30	5	ME2501	YES
Engineering for Industry	30	5	ME2502	YES
TOTAL	120			

Programme Structures and Requirements: Levels, Modules and Credits Stage P				
Module Title	**Credits**	**Level**	**Module Code**	**Core**
Industrial Placement Year	120	P	MEP001	NO
TOTAL	120			

Programme Structures and Requirements: Levels, Modules and Credits **Stage F**				
Module Title	**Credits**	**Level**	**Module Code**	**Core**
Sustainability Project	10	6	CE3012	NO
Electrical Systems Engineering	20	5	EE2ESE	YES
Energy Efficiency	10	6	ME3023	YES
Design Failure Analysis	10	6	ME3039	YES
Final Year Project	40	6	ME3046	YES
Advanced Dynamics and Control Systems	10	6	ME3050	YES
Advanced Systems Design	10	6	ME3055	YES
Solid Mechanics and Finite Element Analysis	10	6	ME3070	YES
Introduction to Nuclear Power	10	6	SE3500	NO
TOTAL	120			

Programme Outcomes, Learning and Teaching and Assessment Strategies			
Knowledge and Understanding			
	On successful completion of their programme students, are expected to have knowledge and understanding of:	**Learning, Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated**	
		Learning and Teaching Methods	**Assessment Methods**
1	Basic mathematics, science and technology underpinning Engineering	Formal lectures Example classes Laboratory work Small group tutorials Individual and group design projects. Seminars Presentations Directed research	Unseen written examinations Open book examinations Essays and project reports. Class tests Presentations Online methods Demonstrations of prototypes Peer review
2	Fundamental concepts, principles and methodologies of Mechanical Engineering and Electrical Power Systems.		
3	Design techniques appropriate to Electro-Mechanical Engineering		
4	Analytical methods using a range of IT and CAD based software.		
5	Business & management methods.		
6	The role of the Engineer in society including professional skills, ethics and sustainability.		
7	Basic mathematics, science and technology underpinning Mechanical Engineering		
8	Fundamental concepts, principles and methodologies of Mechanical Engineering		
9	Design techniques appropriate to Mechanical Engineering		
10	Analytical skills using a range of IT and CAD based software.		
11	Business & management skills.		
12	The role of the Engineer in society including professional skills, ethics and sustainability.		

Intellectual Skills			
	On successful completion of their programme students, are expected to have knowledge and understanding of:	**Learning, Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated**	
		Learning and Teaching Methods	**Assessment Methods**
1	Analyse and solve engineering problems.	Formal lectures Model Making Workshops Individual and group design projects. Seminars Presentations Directed research Self-learning in open access design studios	Unseen written examinations Open book examinations Essays and project reports. Presentations Online methods Demonstrations of prototypes Peer review
2	Evaluate and integrate information from a variety of sources		
3	Plan, conduct, evaluate and report on a programme of work.		
4	Create a solution to an engineering problem being aware of constraints, evaluate and make improvements.		
5	Analyse and solve engineering problems.		
6	Evaluate and integrate information from a variety of sources		
7	Plan, conduct, evaluate and report on a programme of work		
8	Create a solution to an engineering problem being aware of constraints, evaluate and make improvements and using a full range of appropriate tools and techniques.		

Professional Skills			
	On successful completion of their programme students, are expected to have knowledge and understanding of:	**Learning, Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated**	
		Learning and Teaching Methods	**Assessment Methods**
1	Plan and execute safely a series of measurements.	Formal lectures Model Making Workshops Individual and group design projects. Seminars Presentations CAD Workshops and surgeries Self-learning in open access design studios Work based learning (sandwich students only)	Unseen written examinations Project reports. Presentations Online methods Demonstrations of prototypes Peer review
2	Use and apply a variety of prototype making techniques, evaluating testing and refining prototype correctly.		
3	Prepare a technical report or presentation.		
4	Use ICT as both a management and presentation tool.		
5	Use proprietary CAD/CAM packages including 3D solid modelling.		
6	Show an ability in practical technical skills. Plus (for sandwich students) a 12 month professional placement.		
7	Plan and execute safely a series of measurements.		
8	Use and apply a variety of prototype making techniques, evaluating testing and refining prototype correctly.		
9	Prepare a technical report or presentation.		
10	Use ICT as both a management and presentation tool.		
11	Use proprietary CAD/CAM packages including 3D solid modelling.		
12	Show an ability in practical technical skills. Plus (for sandwich students) a 12 month professional placement.		

Transferable Skills			
	On successful completion of their programme students, are expected to have knowledge and understanding of:	**Learning, Teaching and Assessment Strategies to enable outcomes to be achieved and demonstrated**	
		Learning and Teaching Methods	**Assessment Methods**
1	Interpersonal skills appropriate to a professional engineer.	Formal lectures Model Making Workshops Individual and group design projects. Seminars Presentations CAD Workshops and surgeries Self-learning in open access design studios	Unseen written examinations Project reports. Presentations Online methods Demonstrations of prototypes Peer review
2	Ability to communicate effectively (written, oral and through use ICT techniques)		
3	Team working skills.		
4	Creativity and problem solving skills.		
5	Modelling skills using CAD and prototyping processes.		
6	Time and resource management skills		
7	Ability to learn independently and to facilitate professional development.		
8	Interpersonal skills appropriate to a professional engineer.		
9	Ability to communicate effectively (written, oral and through use ICT techniques)		
10	Team working skills.		
11	Creativity and problem solving skills.		
12	Modelling skills using CAD and prototyping processes.		
13	Time and resource management skills		
14	Ability to learn independently and to facilitate professional development		

Entry Requirements	The general entry requirement for this programme is Grade C in GCSE English Language (or equivalent) plus at least two A2 subjects. In addition to satisfying the general entry requirements candidates must satisfy any specific entry requirement as approved by the School Learning and Teaching Committee. For this programme students must achieve at least 300 points from 3 A2 subjects or from 2 A2 and 2 AS subjects. The A2 subjects must include mathematics and a physical science or technology subject. Alternative qualifications will be accepted where these are equivalent to the conditions above. Students already reading another degree programme at Aston University may be allowed to transfer to this programme with the agreement of the Associate Dean for Undergraduate Programmes.
Programme Regulations	**Attendance requirements** Full-time students are normally required to attend for three stages. Sandwich students are normally required to attend for four stages and to undertake an approved placement for one stage with the placement as the third stage. In order to qualify for the award of a degree a student must have attended the required proportion of tutorials, seminars, practical classes and lectures as specified in the Programme Handbook. In the case of repeated unexcused absence over a period of two weeks or more disciplinary proceedings maybe instituted in the form of a formal letter. Students who do not attend satisfactorily may be required to withdraw from the programme. **Requirements for the Ordinary Degree** The credit requirements for the BEng Ordinary Degree are as specified in the General Regulations for Undergraduate Programmes. The following modules are not required to be taken by students on the Ordinary Programme: Level 2 — ME2602 — Thermofluids & Power Engineering Level 3 — ME3050 Advanced Dynamics & Control; ME3055 Advanced Systems & Desig **Industrial/Professional Training** Sandwich students are required to undertake an appropriate programme of integrated industrial training of at least 40 weeks duration. **Calculation of Degree Award** In calculating the overall mark in the final stage of the programme the total marks shall be based on: Full-time students: 25% of the second stage of the programme and 75% of the final stage of the programme. For Sandwich students: 15% of the second stage of the programme, 10% of the placement stage (level P) and 75% of the final stage of the programme.

This specification provides a concise summary of the main features of the programme and the threshold learning outcomes that a student might normally be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. **The individual modules included in the programme may differ from those included in this programme specification as our programmes are subject to continuous review**. Information on admissions requirements and career opportunities is available in the relevant prospectus. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in the appropriate module guides and programme handbook(s) which are available to students on enrolment.