



**Birmingham City University**  
**Faculty of Technology, Engineering and the**  
**Environment**

**Programme Specification**

**MEng Mechanical Engineering**

<b>Date of Course Approval/Review</b>	<b>Version Number</b>	<b>Version Date</b>
<b>December 2012</b>	<b>1.01</b>	<b>April 2013</b>

## Definitive Documents and Version Control

This document has a version number and reference date in the footer.

The process leading to the introduction of new courses, major changes to courses, and minor changes to courses and modules follows the appropriate formal procedure as described in the Faculty's Academic Procedures and Quality Manual.

On the front sheet of this document, the date of course approval/review refers to the most recent full approval/review event. If later, the version date will be that of the most recent subsequent event at which formal consideration was given to course changes.

Further details about the course and document development may be obtained from minutes of the approval or minor changes board. A history of the document since the last full approval/review event is summarised in the table below and further information relating to past versions can be obtained from the Faculty Office.

Version	Event	Date of event	Authorised by
1.0	Approval meeting	December 2012	Associate Dean
1.01	Meeting conditions	April 2013	Panel chair

# **Programme Specification**

## **MEng(Hons) Mechanical Engineering**

**December 2012**

**NOTE:** This specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes advantage of the learning opportunities that are provided. More detail on the specific learning outcomes, indicative content and the teaching, learning and assessment methods of each module can be found in the Module Specifications and the Student Handbook.

The accuracy of the information contained in this document is reviewed by the University and may be checked within independent review processes undertaken by the Quality Assurance Agency.

<b>Awarding Institution / Body:</b>	<b>Birmingham City University</b>
<b>Teaching Institution:</b>	Birmingham City University
<b>Interim Awards and Final Award:</b>	MEng BEng (Hons) BEng Dip HE Cert HE
<b>Programme Title:</b>	Mechanical Engineering
<b>Main fields of Study:</b>	Engineering Design, Mathematics, Engineering Analysis, Engineering Science, Management, Logistics, Strategic Planning, Environmental Studies, Materials and Manufacture Engineering Practice;
<b>Modes of Study:</b>	FT, Part-Time, Sandwich
<b>Language of Study:</b>	English
<b>UCAS Code:</b>	<b>H300</b>
<b>JACS Code:</b>	

**Professional Status of the programme (if applicable):**

The MEng (Hons) in Mechanical Engineering course is accredited separately by the Institution of Mechanical Engineers (IMechE) as satisfying academic requirements towards Chartered Engineer status (CEng).

**Relevant subject benchmark statements and other external reference points used to inform programme outcomes:**

QAA Benchmarks, UK SPEC General and Specific Outcomes as specified by the IMechE

**Programme philosophy and aims**

The MEng Mechanical Engineering course aims to provide a stimulating environment in which the students' interest in mechanical engineering is fostered by a modern and flexible teaching and learning strategy. The curriculum satisfies the requirements of the UK SPEC and its delivery is characterised by both the implementation of industrial-standard modelling systems for the purposes of analysis and design plus the development of strategic management and leadership skills

The course aims to provide a platform for well-motivated students with high potential to pursue successful careers progressing to senior positions, with responsibilities ranging from technical specialist to engineering generalist. The course is structured so that its themes have a direct relevance to industry's current and expected future needs. Successful graduates will be highly employable with the intellectual, technical and personal qualities necessary to implement new technologies creatively as professional; engineers and engineering managers.

Specifically the course will provide;

- A stimulating and rewarding learning experience which develops knowledge and application skills in both industry relevant technical subjects (e.g. finite element analysis, thermofluids, knowledge based engineering and control) and in management leadership topics (e.g. advanced project management, logistics, strategic planning)
- The experience of the management and delivery of engineering specific projects that have direct industry relevance within both individual and group environments
- A focus on the application of industry-standard modelling and simulation techniques for the analysis, specification and design of mechanical engineering systems;
- An understanding of commercial, legal, ethical and environmental factors associated with the mechanical engineering industry;

- Encouragement to develop transferable and marketable skills and knowledge applicable to a variety of employment opportunities within the mechanical engineering and associated industries;
- An opportunity to acquire skills for continuing professional development.
- A qualification that satisfies accreditation requirements of relevant professional bodies.

**Intended learning outcomes and the means by which they are achieved and demonstrated:**

### **Learning Outcomes**

#### **1. Knowledge and Understanding**

**On completion of the course the students should possess Knowledge and Understanding of:**

- KU1. scientific principles and theories that underpin mechanical engineering disciplines;
- KU2. engineering materials and components;
- KU3. design processes and methods;
- KU4. analytical and mathematical modelling techniques used to create solutions to mechanical engineering problems;
- KU5. computer aided techniques for modelling, simulation and design of mechanical systems;
- KU6. business, organisational, teamwork and management practices in industries based on mechanical engineering and the limitations thereof;
- KU7. commercial, ethical, regulatory and environmental factors that influence the choice of solutions to engineering problems.

#### **2. Intellectual Skills**

**On completion of the course the students should be able to**

- IS1. argue rationally and draw independent conclusions based on a rigorous, analytical and critical approach;
- IS2. critically appraise the usefulness of new technologies and changes

in engineering practice;

- IS3. design a system, component or process to meet a specification;
- IS4. develop innovative designs and solutions based on a broad range of scientific principles taking into account commercial risks and constraints, intellectual property rights and contractual issues, and environmental impact;
- IS5. apply mathematical and/or computer based modelling to analyse new designs and generate solutions to mechanical engineering problems;
- IS6. critically appraise the results of mathematical and computer based analyses

### **3. Practical Skills**

**On completion of the course the students should be able to**

- PS1. demonstrate practical engineering skills to use appropriate laboratory and workshop equipment;
- PS2. use computer based systems for modelling and design of mechanical systems, recognising their limitations and having some awareness of their future development;
- PS3. apply primary and secondary research methods using a wide range of sources of information and appropriate methodologies in the management of engineering projects taking into account of a range of commercial and industrial constraints;
- PS4. apply industry codes of practice and standards.

### **4. Transferable/Key Skills**

**On completion of the course the students should be able to**

- TS1. participate effectively in group working activities in a leadership role being able to undertake most of the technical functions within the group and managing the delivery of a plan under changing circumstances.
- TS2. manage time and prioritise workloads showing high levels of independent learning
- TS3. integrate a wide range of data from a variety of sources to; solve a range of engineering problems, apply understandings to challenging situations and be aware of the limitations of the solution;

- TS4. integrate presentational techniques and the information to be presented for maximum effect;
- TS5. access and make appropriate use of numerical and statistical information and develop a deeper understanding and/or greater impact
- TS6. make effective use of information and communications technologies, including word and data processing packages, the internet and electronic information retrieval systems;
- TS7. Research and use new methods required for novel situations and adapt to specific purposes if required

### **Learning teaching, and assessment methods used**

Topics will be introduced by means of lectures and tutorials with an emphasis on interactive learning. These will be consolidated through problem solving tutorials and where appropriate, computer applications and self directed study.

The scheme of work in all modules will be issued at the commencement of the course and will contain a detailed plan of the work covered each week

The delivery of materials for this course will be through lecture/tutorial sessions. Any lab-based work will consist of a mix of lecture and practical work on computers.

Tutor led sessions will be supplemented by access to online learning via the *Moodle Virtual Learning Environment*.

On-line delivery will be in the form a number of different formats including video lectures, multiple-choice questions, quizzes, forums and FAQs. More traditional access to notes, summative and formative assessments will also be provided via the VLE.

The use of the VLE will provide the student with the opportunity to access and revisit material such as Video Lectures and Multiple choice questions for revision and reinforcement.

Summative Assessments will take a variety of formats including written assignments, written examinations, presentations and in-class testing.

Formative Assessments will be a key element by which students can gauge their own performance and engagement with the course. These will comprise formative practical test, multiple choice questions and in-class practical exercises.

Additional support will be organised and provided throughout the course with

additional workshops and one-to-one teaching provided by the Learning Centre and/or Tutors if necessary.

## Programme structure

### MEng Mechanical Engineering (Full Time)

Level 7						
Master's Group Project (30)	Thermofluids (15)	Finite Elements Analysis (15)	Knowledge Based Engineering (15)	Structural Integrity (15)	International Logistics and Supply Chain Management (15)	Operations and Process Management (15)
Level 6						
Undergraduate Project (30)	Power & Energy Systems (30)		Design Management (15)	Advanced Engineering Analysis (30)		Dynamics & Control (15)
Level 5						
Sustainable Design & Manufacture (30)	Mechanics & Dynamics (30)	Environmental Studies and Thermodynamics (30)	Management of Engineering & Technology Innovation (15)		Numerical Analysis (15)	
Level 4						
Engineering Design (30)	Applied Mechanics & Dynamics (30)	Applied Thermodynamics (15)	Materials & Manufacture (15)	Mathematical Analysis (30)		

Levels 4 to 6 are common with the existing BEng Mechanical Engineering course.



## MEng Mechanical Engineering (Part Time)

P/T Yr7	30 Credits L7 Master's Group Project	15 Credits L7 Operations and Process Management	15 Credits L7 International Logistics and Supply Chain Management	
P/T Yr6	30 Credits L6 Undergraduate Project	15 Credits L7 Structural Integrity	15 Credits L7 Knowledge Based Engineering	
P/T Yr5	30 Credits L6 Power and Energy Systems	15 Credits L7 Finite Elements Analysis	15 Credits L7 Thermofluids	15 Credits L6 Design Management
P/T Yr4	30 Credits L5 Environmental Studies and Thermodynamics	30 Credits L6 Advanced Engineering Analysis	15 Credits L5 Management of Engineering & Technology Innovation	15 Credits L6 Dynamics and Control
P/T Yr3	30 Credits L5 Mechanics and Dynamics	30 Credits L5 Sustainable Design and Manufacture	15 Credits L5 Numerical Analysis	
P/T Yr2	30 Credits L4 Engineering Design	15 Credits L4 Materials and Manufacture	15 Credits L4 Applied Thermodynamics	
P/T Yr1	30 Credits L4 Applied Mechanics and Dynamics	30 Credits L4 Mathematical Analysis		

## Support for Learning including Personal Development Planning (PDP)

Students are encouraged to identify and, with guidance, to reflect on their own learning needs and are offered the following support as appropriate to meet those needs:

- an induction programme dealing with orientation and the dissemination of essential information, including an introduction to PDP;

- a dedicated Learning Centre with open access learning materials, resources and full-time staff specialising in a variety of support areas;
- a Student Handbook, containing information relating to the University, Faculty, course and modules;
- access to administrative staff and to academic staff, including the Tutors, Course Director and Programme Manager, at reasonable times;
- support staff to advise on pastoral and academic issues, and to offer support and assistance with the keeping of Students' Progress Files;
- access to Faculty resources, including a range of IT equipment and the services of, and guidance from, IT support staff;
- access to the University's Student Services, including those offered by the careers service, financial advisers, medical centre, disability service, crèche, counselling service and chaplaincy;
- resources for Professional Development Planning (PDP) to enable reflection on learning, performance and achievement and to plan personal, educational and career development. The university offers a range of on-line courses ([www.moodle.bcu.ac.uk](http://www.moodle.bcu.ac.uk)) to support PDP topics including: Reflection, Career and Employability, Action Planning, Self Awareness and Self Employment.

## Criteria for admission

Candidates must satisfy the general admissions requirements of the programme, which are as follows:

Entry requirements are in accordance with section D of the University's Academic Regulations and Policies.

All applicants must have GCSE (grade C or above) in Maths and English Language or equivalent. In addition, applicants should have one of the following, for which the typical tariff offer is 280 points for Curriculum 2000, or equivalent for other qualifications. Actual tariff offers may vary from 280 points.

Qualification	Requirements
Curriculum 2000, A Levels	Five GCSEs/GCEs including at least two subjects at A2 level, and AS level Mathematics grade C or above.
Curriculum 2000, AVC.	Two 6-unit or one 12-unit AVCE.
Irish Leaving Certificate	Passes in six subjects at the higher grade including Mathematics.
Scottish Certificate of Education	Passes in five subjects at the higher grade including Mathematics.
International Baccalaureate or European Baccalaureate	Including higher level Mathematics.
BTEC/Edexcel National Certificate/National Diploma	Pass National Diploma In an appropriate subject. with Merit Merit Pass A DISTINCTION in Maths for Technicians UNIT or a PASS in Further Maths for Technicians UNIT
A pass in a recognised Access or Foundation Year for BEng course	
A professional qualification of an appropriate standard	
A qualification deemed equivalent to one of the above	

Other learning and experience may be considered for entry to the programme. A student may be allowed entry to a course if he or she does not have the standard entry qualifications but can provide evidence of necessary knowledge and skills to successfully enter and complete the course.

Applicants with a Higher National Certificate or Higher National Diploma, including Merits, in an appropriate subject, or an equivalent qualification, may be offered entry with advanced standing.

UCAS applicants are invited to register for one of the TEE's special programme of UCAS visit days held throughout the academic year. UCAS visit days include a tour of facilities and an introduction to the TEE's courses and activities. Meetings are arranged between course tutors and prospective students to ensure opportunity is provided for individual questions and clarification of the course content.

## **Methods for evaluation and enhancement of quality and standards including listening and responding to views of students**

The following faculty committees are involved in evaluation and enhancement of quality, standards and student experience: Board of Studies, Faculty Board, Learning and Teaching Committee, Academic Standards and Quality Enhancement Committee.

Review and evaluation processes in which students are involved include annual course and module reviews, course review and re-approval events, professional body accreditation visits and external examiner visits. Mechanisms for student input include meetings with course tutors, feedback questionnaires, faculty and university student satisfaction surveys and representation on the faculty committees referred to above.

External examiners are members of examination boards and their remit includes meeting students and monitoring and reporting on academic standards.