Programme Specification

Programme: BEng (Hons) Engineering with Foundation

Awarding Institution:	University of Bolton		
Teaching Institution:	University of Bolton		
Division and/or Faculty/Institute:	Faculty of Advanced Engineering & Sciences		
Professional accreditation	Professional body	Professional body URL	Status of graduates
Final award(s):	BEng(Honours)		
Interim award(s)	none		
Exit or Fallback award(s)	Dip HE in Engineering Cert HE in Engineering		
Programme title(s)	Engineering		
UCAS Code	H108		
JACS Code	H100 Engineering		
University Course Code(s)	ENG0016		
QAA Benchmark Statement(s)	'The QAA subject benchmark statements define the academic standards expected of graduates with engineering' BEng. The defined learning outcomes are those published by the Engineering Council in the *UK Standards for Professional Engineering Competences* (UK-SPEC) for Incorporated Engineer (IEng) which states: Incorporated Engineers maintain and manage applications of current and developing technology, and may undertake engineering design, development, manufacture, construction and operation. Incorporated Engineers are variously engaged in technical and commercial management and possess effective interpersonal skills.		
Other internal and external	QAA Academic Infrastructure, including the Framework		

reference points	for Higher Education Qualifications and the Code of Practice UK Quality Code for Higher Education University of Bolton awards framework
Language of study	English
Mode of study and normal period of study	4 years Full Time

Admissions criteria

Full time:

- 5 GCSE Passes at grade C or above including Mathematics, Science. In addition, GCSE in English or equivalent is required.
- Satisfactory UCAS points via A/AS/Vocational A Levels or equivalent.
- International/European Baccalaureate or equivalent internationally recognised qualification.
- Edexcel-BTEC Ordinary National Diploma/Certificate in engineering with Level 3 Maths and Science will be considered.
- International Students, whose first language is not English, must have a pass in an approved test in English, e.g. IELTS with a score of at least 6 or equivalent.

Non Standard Entry

Cases dealt with by admissions tutor on an individual basis.

-

Additional admissions matters

Interviews will be used for all potential Engineering with Foundation students to assess suitability or entry level onto the programme. It is the Faculty's intention to invite all applicants to this Programme to meet the staff, tour the facilities and take part in an interviewing process. The interview will include taking part in an interactive Maths-focused assessment. You will be made aware of your Mathematical strengths and shortfalls, and this will be discreetly discussed with the programme team. Prospective students with lower entry level Maths will be provided with additional guidance and resources to help improve any deficiencies. Your engagement with this process is key to your successful progression.

Fitness to practise declaration

Not applicable

Aims of the programme

This BEng (Honours) in Engineering with Foundation route is for four years. The Foundation year is specifically designed for students who do not have the necessary qualifications for

direct entry onto a degree course.

The broad aims of this BEng (Honours) programme are to educate and develop prospective engineers towards satisfying the academic requirements leading to Incorporated Engineer status and to prepare engineers for meaningful professional employment in the engineering sector of industry. The learning outcomes governing this programme and hence this degree route, are those contained within UK Standards for Professional Engineering Competences (UK-SPEC). These Learning Outcomes, set out in Section 12, have been adopted from the Engineering Council (EC^{uk}) and form the QAA benchmarks and framework for the BEng (Hons) programme in Engineering with Foundation.

This BEng (Hons) four year route is designed to satisfy the main academic requirements for student progression towards Incorporated Engineer, though graduates would be required to complete further study and professional training to achieve that status as outlined in the UK-SPEC.

The foundation year will provide you with an excellent grounding in the fundamentals of engineering science and mathematics enabling you to progress to degree-level study.

The programme will equip you with the motivation and intellectual powers for self- study, and encourage personal development.

Course content, teaching methods and assessment procedures ensure that you develop increasing levels of scientific knowledge and analytical ability as you progress.

The principal aims of the programme are that it will produce graduates that are:

- motivated to practise engineering
- enthusiastic, articulate, questioning and open-minded
- recognised nationally and internationally as highly competent engineering graduates
- aware of the financial, moral, legal, economic, environmental and cultural constraints in which they operate
- aware of current management practice
- committed to and prepared for lifelong learning

In doing so, the programme aims to:

- establish the relevance of engineering to real world problems
- use design as an integrative element in the whole of the degree
- incorporate health and safety, environmental issues and sustainability
- ensure content matches the needs and developments in modern industry and society
- encourage reflection on learning experiences
- develop modelling and analytical skills and the application of those skills
- involve breadth and depth of coverage to meet the needs of industry and society in technical, management and business topics
- encourage and develop a process of Personal Development Planning (PDP)

Distinctive features of the programme

On the BEng Foundation Year 1 :

- Extensive hands-on work – structures, electronics, mechanisms, electrical machines – to

encourage practical investigation of systems
- Parallel underpinning theory classes which provide rigour to the practical sessions
- High contact hours (84 per module) to provide you with the best opportunity to succeed.
- Dedicated teaching of both general and Engineering-specific study skills in each module; self-assessment exercises via the Virtual Learning Environment (VLE)

On the BEng year 2,3 &4 :

- Open access and skills development in quality Computer Aided Drawing (CAD), Analysis, Optimisation, Computer Aided Manufacturing (CAM) and Computer Aided Engineering (CAE) software.
- The Team Project FNG 5003 is recognised and supported through grants from the Royal Academy of Engineering as following the Engineering Gateway programme endorsed by the Engineering Council.
- Project-based learning (PBL) at every stage, either in groups or as individuals, linked to ePDP.
- 'Hands-on' Project type modules at all levels of the programme for assimilation and integration of topics and material.
- Industrial visits.
- Group and individual project opportunities include:
    - The IMechE Design Challenge for Undergraduate Engineers, which is built into the 1st yr Projects & Systems module – this is a 'design and make' competition against other universities in the North West.
    - The British Model Flying Association's University Challenge – another annual challenge, at national level for BEng students. Design, build and fly a large model aircraft. There will be various activities for this challenge built into every year of the programme, including Indoor Gliders (1st Yr), Indoor Electric r/c Aircraft (2nd Yr) and the Final Competition Aircraft (3rd Yr).
    - The opportunity to participate in the IMechE/SAE "Formula Student" challenge, an international inter-university programme for BEng student teams to design, build and compete with a small racing car.
    - Individual and group Industrial 'live' projects.

Programme learning outcomes

UK-SPEC **General** Learning Outcomes:

On completion of this programme you will:

Understanding & Knowledge

- be able to demonstrate your knowledge and understanding of essential facts, concepts, theories and principles of the engineering discipline, and its underpinning science and mathematics.
- have an appreciation of the wider multidisciplinary engineering context and its underlying principles.
- appreciate the social, environmental, ethical, economic and commercial considerations affecting the exercise of your engineering judgement.

Intellectual Ability

- be able to apply appropriate quantitative science and engineering tools to the analysis of problems.
- be able to demonstrate creative and innovative ability in the synthesis of solutions and in formulating designs.
- be able to comprehend the broad picture and thus work with an appropriate level of detail.

Practical Skills

- possess practical engineering skills acquired through, for example, work carried out in laboratories and workshops; in industry through supervised work experience; in individual and group project work; in design work; and in the development and use of computer software in design, analysis and control.

- Evidence of group working and of participation in a major project is expected. However, individual professional bodies may require particular approaches to this requirement.

General Transferable Skills

- have developed transferable skills that will be of value in a wide range of situations. These are exemplified by the Qualifications and Curriculum Authority Higher Level Key Skills and include problem solving, communication, and working with others, as well as the effective use of general IT facilities and information retrieval skills. They also include planning, self-learning, and improving performance, as the foundation for lifelong learning.

UK-SPEC **Specific** Learning Outcomes:

Underpinning science and mathematics, and associated engineering disciplines, as defined by the relevant engineering institution

- Knowledge and understanding of the scientific principles underpinning relevant current technologies, and their evolution;
- Knowledge and understanding of mathematics necessary to support application of key engineering principles.
- An awareness of developing technologies related to own specialisation
- An understanding of concepts from a range of areas including some outside engineering ,and the ability to apply them effectively in engineering projects

Engineering Analysis

- The ability to monitor, interpret and apply the results of analysis and modeling in order to bring about continuous self improvement;
-The ability to apply quantitative methods and computer software relevant to your engineering technology discipline(s), frequently within a multidisciplinary context;
- An ability to use the results of analysis to solve engineering problems, apply technology and implement engineering processes;
- The ability to apply a systems approach to engineering problems through know-how of the application of the relevant technologies.

Design
Graduates will need the knowledge, understanding and skills to:
- Define a problem and identify constraints;
- Design solutions according to customer and user needs;
- Use creativity and innovation in a practical context;
- Ensure fitness for purpose (including operation, maintenance, reliability et cetera);
- Adapt designs to meet their new purposes or applications.

Economic, social and environmental context
- Knowledge and understanding of commercial and economic context of engineering processes;
- Knowledge of management techniques which may be used to achieve engineering objectives within that context;
- An understanding of the requirement for engineering activities to promote sustainable development;
- An awareness of the framework of relevant legal requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues;
- An understanding of the need for a high level of professional and ethical conduct in engineering.

Engineering Practice
- An understanding of and ability to use relevant materials, equipment, tools, processes, or products;
- Knowledge and understanding of workshop and laboratory practice;
- Knowledge of contexts in which engineering knowledge can be applied (eg operations and management, application and development of technology etc);
- The ability to use and apply information from technical literature;
- The ability to use appropriate codes of practice and industry standards;
- An understanding of the principles of managing engineering processes;
- An awareness of quality issues and their application to continuous improvement

Programme structure
The BEng programme Foundation year 1 requires 120 credits at level 3 to progress to level HE4 in Engineering.

The BEng programme years 2,3 &4 require 360 credits to be established for the award BEng (Hons) in Engineering with Foundation; 120 credits at HE4, 120 credits at HE5 and 120 credits at HE6.

All modules are Core modules. The majority are of 20 credit value other than the 40 credit Project-type modules required for the assimilation and integration of topics and material.

Module Code	Module title	Core/ Option/ Elective (C/O/E)	Credits	Length (1, 2 or 3 periods)
ATT3027	Foundation Mathematics	C	20	1

ATT3028	Foundation Mechanics	C	20	1
ATT3029	Electrical &Electronic Principles	C	20	1
ATT3030	Thermal& Environmental Studies	C	20	1
ATT3031	Engineering Principles	C	20	1
ATT3032	Engineering Systems and Investigations	C	20	1
AME4051	Engineering Environment	C	20	1
AME4052	Engineering Principles 1	C	20	1
AME4053	Engineering Principles 2	C	20	1
AME4054	Projects & Systems	C	40	2
AME4055	Graphical Communication & Computer Modelling	C	20	1
AME5001	Engineering Applications	C	40	2
FNG5001	Engineering Design & Technology	C	20	1
FNG5002	Engineering Systems & Automation	C	20	1
FNG5003	Team Project	C	20	1
FNG5004	Applied Engineering Analysis	C	20	1
FNG6001	Individual Project	C	40	2
AME6003	Management & Enterprise in Engineering	C	20	1
AME6004	Life Cycle Management	C	20	1
MEC 6003	Computer Aided Analysis and Simulation	C	20	1
MEC6004	Computer Aided Manufacturing	C	20	1

Learning and teaching strategies

The diverse nature of this engineering programme necessitates the use of a variety of teaching and learning methods in order to ensure the acquisition and development of appropriate concepts, knowledge and skills. Many of these methods will be experienced during formal timetabled classes. Other methods, which are also demanded by professional body accreditation requirements, will be experienced through opportunities to develop creativity and innovative skills. This is predominantly achieved through open-ended project and design, make and test activity, where the application, assimilation and integration of course materials is realised. As projects, design activity and assimilation are extremely important and time-dependent, all project modules are 40 credit value and run over two trimesters. As you progress through the programme, you will adopt a more independent role with tutors offering support.

Lectures:

Predominantly encountered at all Levels, this method allows for the dissemination of theoretical material that will guide you through your studies, as well as problem solving and problem solution methods. Some of these lectures may be delivered by external experts and

associates.

Tutorials and Tutorial Exercises:
Tutorials are based on set exercises given to students during formal teaching sessions. You prepare for tutorial sessions by preparing solutions to set engineering problems and attend tutorial sessions to discuss and receive formative feedback on your performance and problem solving. Some of the exercises may be included in coursework portfolios, which are then summatively assessed.

Tutor Lead in-class exercises:
Here the lecturer sets particular in-class exercises and coaches you how to solve the given problem or process the information. Guidance, discussion and formative feedback takes place throughout.

Case Studies:
These involve particular exemplary engineering problems that typify actual situations or activities encountered in industry and the engineering profession. They bring relevance and application to the topic/s in hand and inform you of the types of activity or endeavour required to solve typical engineering problems.

Practical Workshop sessions (computer or workshop):
Used predominantly for skills learning and teaching, though understanding and awareness would also be achieved; these sessions allow hands-on experience and, in the case of IT, skills training that is utilised in the rest of the programme.

Laboratories and Investigations:
Laboratory sessions and practical investigations form an important part of engineering learning and teaching. They allow you to understand the origin of the factual information given to you, allow for experimentation and the use of experimental methods and give you the opportunity to appreciate the origin of standards and their establishment.

Assignments and Projects:
Assignments and Projects form a major part of the programme as they develop your engineering abilities through cross-disciplinary integration of technical topics and assist in assimilation of course material. They appear in modules ATT3032 Engineering Systems and Investigations, AME5001 Engineering Applications, in AME4054 Projects & Systems and, of course, in the Team / Individual Project modules.

Assignments and projects also facilitate the development of coherent ePDP with significant formative feedback and assessment.
They satisfy professional accreditation requirements by:

- Including and being devoted to design, make, and test exercises that occur in the first two years of the course;

- Incorporating open-ended engineering problems where engineering science and other engineering subjects integrate with laboratory experiments, simulation, hands-on experience and project work.

These modules accommodate, for example, the IMechE Design Challenge, Formula Student and the British Model Flying Association Heavy Lift and Electric Lift Challenges - all annual national competitions.

Individual & Team working:
Assignment and Project work will be a mixture of Individual independent study and team activity that aims to mimic real-life industrial situations or simulations. The HE6 Project is individual in nature and allows for organisational planning, setting goals, reflection on project outcomes, individual performance and so on.

ePDP:
You are expected to create and maintain an 'electronic Personal Development Plan' (ePDP). This development tool will be developed using Mahara and will be your own property to take with you into your career and Professional Development. The development of this plan is encouraged by the professional body and will form the foundation to their Professional Development Plan which would be required for any application for membership of the professional body. The ePDP offers the opportunity for self performance evaluation, reflection, and planning during your studies and the opportunity to record your experiences and development during your time at the University.

Learning activities (KIS entry)

	Course Year						
	1	2	3	4	5	6	7
Scheduled learning and teaching activities	42	34	29	23			
Guided independent study	58	66	71	77			
Placement/study abroad							

Assessment strategy

The assessment strategy for the programme is designed to ensure that the overall aims and

learning outcomes of the programme are assessed and achieved. To accomplish this, a range of assessment methods are used and applied depending upon the learning outcome in question and the type of module content being assessed. Assessment and feedback may be Formative or Summative.

In line with the University of Bolton Curriculum Framework, Summative Assessment (that leading to assignment/project mark, module grade and hence to overall performance classification) constitutes a maximum of two pieces of assessed work per 20 credit module. You must achieve an average of 40% with no mark coming below 35% in all elements of assessment for each module of the Foundation year. From HE4 onwards you must achieve 40% in all elements of assessment for each module.

Summative Assessment may consist of:

Project, Assignment and/or Design reports

These reports may be brief or medium sized assignments that conduct an investigation into a particular topic or engineering problem/theory or major piece of coursework that reflect the progress and activity of research, investigation and the solution to a particular engineering problem or system. HE6 projects may be live projects of industrial relevance that demand the making of recommendations for future use and guidance. At HE6 the projects are open-ended investigations that demand the setting of aims and objectives and critically appraising outcomes. Theories or processes may be put forward to be investigated further by students following on behind.

Examinations

Examinations assess your knowledge and understanding of topics and theories covered within a module. These assessments are time limited and sat under University examination regulations and procedures.

Module Portfolios

Module portfolios are used throughout the programme and reflect the experiences and exercises that you have experienced during a module. They are compiled, edited and collated by you. They are monitored by the module tutor and submitted for assessment towards the end of the module. A portfolio may reflect the whole of the assessment of a module or may form the Coursework element mark for a module.

Presentations

You are required to make oral presentations in a number of modules. Some modules may specify such a presentation as part of their summative assessment, whilst seminar presentations in other modules may not be part of the formal assessment. To augment the tutor's assessment, some modules will also make use of "peer review" where you will assess your peers against pre-determined assessment guidelines.

Formative Feedback and Assessment is given by the following methods and processes:

Tutorial session feedback on problem solving. Guidance and reflection of your ability to solve engineering problems: have you used and followed the correct solution procedure and arrived at the right answer?

Verbal feedback and guidance during the conduct of an assignment or project.

Whole package of formative feedback involved in design, make & test exercises (Is it a successful working design?)

Guidance and information given when following programme learning material such as IT and CAD package tutoring.

Written feedback on assignment/project reports.

ePDP self-assessment, reflection and recommendations.

Group working and peer assessment

Internal and external competitive design and make exercises (Reflection on performance during such exercises).

Assessment methods (KIS entry)

	Course Year						
	1	2	3	4	5	6	7
Written exams		33%	10%	0%			
Coursework	100%	63%	90%	92%			
Practical exams		4%	0%	8%			

Assessment regulations

- Assessment Regulations for Undergraduate Modular Programmes

The mark awarded will be made up, where specified, of the weighted average of the examination and coursework assessment marks. For the BEng Foundation year 1 you must achieve a modular mark of 40% with no individual item of assessment being below 35%. For the BEng Programme year 2,3 & 4 you must achieve a mark of 40% or above in all assessments for each module in order to pass.

For the full and current version of the Assessment Regulations, refer to the document "*Assessment Regulations for Undergraduate Modular Programmes (Main Document)"* at the following university intranet site:
http://www.bolton.ac.uk/Quality/QAEContents/APPR/Home.aspx

Grade bands and classifications

Grade Description	Mark %	Honours Degree Classification
Work of exceptional quality	70+	i
Work of very good quality	60-69	ii.i
Work of good quality	50-59	ii.ii
Work of satisfactory quality	40-49	iii
Borderline fail	35-39	
Fail	Below 35	

Honours classification
You will normally be awarded the honours classification resulting from the application of either Rule ACM20 or Rule ACM6.

Rule ACM20

A weighted average of the marks from modules worth a total of 200 credits at Levels HE5 and HE6 combined, including the marks from modules worth no more than 80 credits at least at Level HE5 (weighted 30 percent) and marks from modules worth at least 120 credits at Level HE6 (weighted 70 percent), which represent the best marks achieved by you at those Levels.

Where the average falls unequivocally into one of the following bands: 48.00 - 49.99, 58.00 - 59.99, 68.00 - 69.99; and you have achieved marks clearly in an honours classification category higher than their average for modules worth at least 110 credits, then you will be awarded an honours degree in the classification category one higher than that indicated by your average.

Rule ACM6 (an alternative if you do not have sufficient marks at Levels HE5 and 6 to apply ACM20)

A simple average of the equally weighted marks from modules worth 120 credits at Level HE6 which represent the best marks achieved by you at that Level.

Where the average falls unequivocally into one of the following bands: 48.00 – 49.99, 58.00 – 59.99, 68.00 – 69.99; and you have achieved marks clearly in an honours classification category higher than their average for modules worth at least 70 credits, then you will be awarded an honours degree in the classification category one higher than that indicated by

their average.

Where you have marks available for fewer than 120 credits at Level HE6, honours classification shall normally be based **solely** on a simple average of the available marks for modules at Level HE6, subject to there being marks for a **minimum of 60 credits awarded by the University**. **Upgrading of the honours classification will not normally be available where there are marks available for fewer than 120 credits at Level HE6**, unless this is explicitly approved.

Role of external examiners

External examiners are appointed for all programmes of study. They oversee the assessment process and their duties include: approving assessment tasks, reviewing assessment marks, attending assessment boards and reporting to the University on the assessment process.

Support for student learning

- The programme is managed by a programme leader
- Induction programme introduces the student to the University and their programme
- Each student has a personal tutor, responsible for support and guidance
- Personal Development Planning (PDP) integrated into all programmes
- Feedback on formative and summative assessments
- A Student Centre providing a one-stop shop for information and advice
- University support services include housing, counselling, financial advice, careers and a disability
- A Chaplaincy
- Library and IT services
- Student Liaison Officers attached to each Faculty
- The Students' Union advice services
- Faculty and Programme Handbooks which provide information about the programme and University regulations
- The opportunity to develop skills for employment
- English language support for International students
- Specialist teaching facilities/resources
- Support from professional bodies by student membership of IET

Methods for evaluating and enhancing the quality of learning opportunities

- Programme committees with student representation
- Module evaluations by students
- Students surveys, e.g. National Student Survey (NSS)

- Annual quality monitoring and action planning through Programme Quality Enhancement Plans (PQEPs), Data Analysis Report (DARs) Subject Annual Self Evaluation Report (SASERs), Faculty Quality Enhancement Plans (FQEPs), University Quality Enhancement Plan (UQEP)
- Peer review/observation of teaching
- Professional development programme for staff
- External examiner reports

Other sources of information

Student portal: (http://www.bolton.ac.uk/Students/Home.aspx
Students Union : (http://www.ubsu.org.uk/)
Faculty or similar Handbook: www.bolton.ac.uk/students
Programme Handbook (add link)
Student Entitlement Statement
http://www.bolton.ac.uk/Students/AdviceAndSupport/Home.aspx

Module database: https://modules.bolton.ac.uk/
Moodle: (http://elearning.bolton.ac.uk/)
External examiners reports:
http://www.bolton.ac.uk/Quality/QAEContents/ExternalExaminersReports/Home.aspx

Document control

Author(s)	Dr Safa Alhakeem and Karl Gregory
Approved by:	
Date approved:	
Effective from:	**2012**
Document History:	

Bolton Key Core Curriculum requirements for the BEng Foundation year1

Complete the grid using the following (Developed = D, Taught = T, Assessed = A)

Module Title	Module Code	C/O	Bolton Values													
			PDP	Communication	Team work	Organisation & Planning	Numeracy	Problem solving	Flexibility & adaptability	Action planning	Self awareness	Initiative	Personal impact & confidence	Inter-nationalisation	Environmental sustainability	Social, public and ethical responsibility
Electrical & Electronic Principles	ATT3029			D	D	D	DTA	DTA	D			D			DT	
Thermal & Environmental Studies	ATT3030			D	D		DTA	DTA						D	DTA	
Engineering Principles	ATT3031				D		DTA	DTA						D		
Engineering Systems and Investigations	ATT3032		DTA	DA	D		D	DT		DA		DT				D
Foundation Mechanics	ATT3028				D		DTA	DTA						D		
Foundation Mathematics	ATT3027				D		DTA	DTA						D		

Assessment Key For

BEng Foundation year 1 **:** CW = Set Exercise / Coursework; A = Assignment Issued;

	1	2	3	4	5	6	7	8	9	10	11	12	13	14		1	2	3	4	5	6	7	8	9	10	11	12	13	14
LEVEL																													
Foundation Mathematics							CW						CW																
Foundation Mechanics																						CW						CW	
Electronic and Electrical Principles								CW					CW																
Thermal and Environmental Studies								CW					CW																
Engineering Principles																						CW						CW	
Engineering Systems and Investigations																A											CW		

Module listing for BEng Foundation year 1

Module Title	New or Current	Code	Level *	Credits *	Type *	Length *	Mode and Core/Option (enter 'C' or 'O')				Elective (enter 'E')	Prerequisite Module Code(s)	**Is the assessment different to what**	Assessment Type Code *	Assessment %	Assessment Type Code *	Assessment %	Assessment Type Code *	Assessment %	Assessment Type Code *	Assessment %	Specify Final Assessment
							S	M	J	Mn												
Foundation Mathematics	✓	ATT3027	3	20	CORE	1	C					NONE		CW	50	CW	50					CW2
Foundation Mechanics	✓	ATT3028	3	20	CORE	1	C					NONE		CW	50	CW	50					CW2
Electrical & Electronic Principles	✓	ATT3029	3	20	CORE	1	C					NONE		CW	50	CW	50					CW2
Thermal & Environmental Studies	✓	ATT3030	3	20	CORE	1	C					NONE		CW	50	CW	50					CW2
Engineering Principles	✓	ATT3031	3	20	CORE	1	C					NONE		CW	50	CW	50					CW2
Engineering Systems and Investigations	✓	ATT3032	3	20	CORE	1	C					NONE		CW	100							CW

UKSpec Learning Outcomes Map – BEng (Hons) Engineering

d – developed; a – assessed; t - taught

BEng (Hons)in Engineering Modules		Engineering Environment	Engineering Principles 1	Engineering Principles 2	Projects & Systems	Graph'l Comms & Computer Modelling	Engineering Applications	Engineering Systems & Automation	Engineering Design Technology	Applied Engineering Analysis	Team Project	Individual Project	Life Cycle Management	management& enterprise in engineering	computer aided analysis and simulation	Computer Aided Manufacturing
Learning Outcome	**UKSpec Code**	AME4051	AME4052	AME4053	AME4054	AME4055	AME5001	FNG5002	FNG5001	FNG5004	FNG5003	FNG6001	AME6004	AME6003	MEC6003	MEC6004
Underpinning Science & Mathematics and Associate Disciplines																
Knowledge and understanding of the scientific principles underpinning relevant current technologies, and their evolution	US1		dta	dta				dta		dta		d			d	d
Knowledge and understanding of mathematics necessary to support application of key engineering principles.	US2		d	dta			d	d		dta		d			dt	
An awareness of developing technologies related to own specialisation	US2							dt						d	dta	dta
An understanding of concept from a range of areas including some outside engineering ,and the ability to apply them effectively in engineering projects	USm4							dt						d	dta	
Engineering Analysis																
The ability to monitor, interpret and apply the results of analysis and modelling in order to bring about	E2	d	dta	dta	dt			dt	dta	dta		da		d	dta	dta

Programme specification: [BEng(Hons) Engineering with Foundation]
Date: [April 2012]

continuous improvement																
The ability to apply quantitative methods and computer software relevant to their engineering technology discipline(s), frequently within a multidisciplinary context	E3	d	dta	dta	d		dt	dta	dt	dta	dt	td				
An ability to use the results of analysis to solve engineering problems, apply technology and implement engineering processes	E1			d	da		dt		dta	dta	dt	td	dta	d	dta	dt
The ability to apply a systems approach to engineering problems through know-how of the application of the relevant technologies	E4	d			dta		dta	dta	d		d	dta	dta	d		dta
Design																
Define a problem and identify constraints	D1				d	d	da		dta		dta	dta			d	dta
Design solutions according to customer and user needs	D2					d	da	d	d		d	dta			t	d
		AME4051	AME4052	AME4053	AME4054	AME4055	AME5001	FNG5002	FNG5001	FNG5004	FNG5003	FNG6001	AME6004	AME6003	MEC6003	MEC6004
Use creativity and innovation in a practical context	D4				dta		dta			dta					t	t
Ensure fitness for purpose (including operation, maintenance, reliability etc)	D5				da	dta	d	dt	dta		t	d			t	t
Adapt designs to meet their new purposes or applications	D1m				da		d	d	d		d	dta				d
Economic, social and environmental context																
Knowledge and understanding of commercial and economic context of engineering processes	S1	dta						dta	dta				dta	dt	d	dta
Knowledge of management techniques which may be used to achieve engineering objectives within that context	S2	dt						d						dta		
An understanding of the requirement for engineering activities to promote sustainable development	S3	dta					dt	dta	dt		d	d		dt	d	
An awareness of the framework of relevant legal	S4	dta						dt	dt		d	d		dt		

requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues																
An understanding of the need for a high level of professional and ethical conduct in engineering.	S5	dt						t				d		dta		
Engineering Practice																
An understanding of and ability to use relevant materials, equipment, tools, processes, or products;	P1	dt		d			d	dt	dta					dta	dta	dta
Knowledge and understanding of workshop and laboratory practice	P2	dt		dt	dt	d	dt	dt			dta	dta		dt		t
Knowledge of contexts in which engineering knowledge can be applied (eg operations and management, application and development of technology etc)	P3	dt	d	d		dta	dta					d	dta	dt	dta	dta
The ability to use and apply information from technical literature	P4	dt				dt		d	dta		dt	dta		dt	dta	dt
The ability to use appropriate codes of practice and industry standards	P6	dt							dta			d		dta		
An awareness of quality issues and their application to continuous improvement	P7	dt				dta			dt			d		dta		t

d – developed; a – assessed; t - taught

Module listing BEng(Hons) in Engineering year 2,3 &4

Module title	Mod Code	New? ✓	Level	Credits	Type	Core/Option/Elective C/O/E	Pre-requisite module	Assessment 1			Assessment 2			Assessment 3			Assessment 4		
								Assessment type	Assessment %	Add Y if final item	Assessment type	Assessment %	Add Y if final item	Assessment type	Assessment %	Add Y if final item	Assessment type	Assessment %	Add Y if final
Engineering Environment	AME4051		HE4	20	S	C		CW	50		CW	50	Y						
Engineering Principles 1	AME4052		HE4	20	S	C		CW	40		EX	60	Y						
Engineering Principles 2	AME4053		HE4	20	S	C		CW	40		EX	60	Y						
Projects & Systems	AME4054		HE4	40	P	C		CW	30		PRA	20		CW	50	Y			
Graphical Communication & Computer Modelling	AME4055		HE4	20	S	C		EX	45		PRA	55	Y						
Engineering Applications	AME5001		HE5	40	P	C		CW	30		PRA	20		CW	50	Y			
Engineering Systems & Automation	FNG5002	✓	HE5	20		C		CW	50		CW	50	Y						
Engineering Design Technology	FNG5001	✓	HE5	20	S	C		CW	50		CW	50	Y						
Applied Engineering Analysis	FNG5004	✓	HE5	20	S	C	AME4052 AME4053	CW	50		EX	50	Y						
Team Project	FNG5003	✓	HE5	20	P	C		PRA	30		CW	70	Y						
Individual Project	FNG6001	✓	HE6	40	P	C		CW	20		PRA	10		PRA	20		CW	50	
Life Cycle Management	AME6004		HE6	20	S	C		CW	75	Y	PRA	25							
Management &Enterprise in Engineering	AME6003		HE6	20	S	C		CW	50		PRA	50	Y						
Computer Aided Analysis and Simulation	MEC6003		HE6	20	S	C		CW	25		CW	75	Y						
Computer Aided Manufacturing	MEC6004		HE6	20	S	C		Report	40		Report	60	Y						

Bolton Values Map – BEng(Hons) in Engineering year 2,3&4

BEng in Engineering Modules	Engineering Environment	Engineering Principles 1	Engineering Principles 2	Projects & Systems	Graph'l Comms & Computer Modelling	Engineering Applications	Engineering Systems & Automation	Engineering Design Technology	team project	Applied Engineering Analysis	Individual Project	Life Cycle Management	Management & Enterprise in Engineering	Computer Aided Analysis and Simulation	Computer Aided Manufacturing
Value	AME4051	AME4052	AME4053	AME4054	AME4055	AME5001	FNG5002	FNG5001	FNG5003	FNG5004	FNG6001	AME6004	AME6003	MEC6003	MEC6004
Employability															
Communication	dta	d	d	da	dta	da	dt	dta	dta	d	da	td	dt	da	da
Team Work	d			da		da	d	td	dta				dt	d	d
Organisation & Planning	d			dt		d			dta		da		dta	d	d
Numerical Interpretation		dta	dta	da	d	da	d	dta		dta	da	dta		dta	da
Problem Solving		dta	dta	da		da	dta	dta	dta	dta	da	dta		dta	dta
Flexibility & Adaptability	d								d		d		dt	dta	dta
Action Planning	d			dt		d			dt		da		dt	d	d
Self Awareness	dta						dt		d		d		dt	dta	da
Initiative	d			d		d	d		dta		d		dt	d	dta
Personal Impact & Confidence	d						dt		d		d		dt	da	da
Internationalisation															
International content or international comparative approach	d						dta						dt	d	d
Preparation for international profession	d	d	d					d			d	d	dt		d
Foreign language or cross-cultural communication															
Preparation for internationally recognised qualification	d	d	d	dt		dt	d				d	d	dt		
Environmental Sustainability & Awareness															
Globalisation & the global context	d						d	d	d			d	dta		dta
Consumer culture and the free market	d						d	d	d				dt		
Carbon reduction		d	d						d			dt			
Systems, control mechanisms and environments	d			da		da	dta					dta	dt		
Energy, consumption, waste and technology	d	dt	dt	d				d	d		d	dta	dt	d	dt
Business impact and business practices on the environment	d						dta	td	dta				dt		
Instrumentation and stewardship							d								
Social, Public & Ethical Responsibility															
Professional standards and practice	d	dt	dt	d	td		d		dta	dt			dt	d	dta

Programme specification: [BEng(Hons) Engineering with Foundation]
Date: [April 2012]

Ethics	d						dt		dta				dt	d	
Political or social judgement	d												dt		
Cultural or moral issues	d						d		d				dt		