

**Programme Specification**

**Programme Title: MEng in Automobile Engineering**

<b>Awarding Institution:</b>	The University of Bolton		
<b>Teaching Institution:</b>	University of Bolton		
<b>Division and/or Faculty/Institute:</b>	Faculty of Advanced Engineering & Sciences		
<b>Professional accreditation</b>	Professional body	Professional body URL	Status of graduates
<b>Final award(s):</b>	MEng		
<b>Interim award(s)</b>			
<b>Exit or Fallback award(s)</b>	BEng (Hons) in Automobile Engineering Diploma of Higher Education in Automobile Engineering Certificate of Higher Education in Automobile Engineering		
<b>Programme title(s)</b>	Automobile Engineering		
<b>UCAS Code</b>	H330		
<b>JACS Code</b>	H330		
<b>University Course Code(s)</b>	Full time - ENG0002 Part time – ENG5002		
<b>QAA Benchmark Statement(s)</b>	Engineering (2010)  UK Standards for Professional Engineering Competences (UK-SPEC): The Accreditation of Higher Education Programmes (2010).		
<b>Other internal and external reference points</b>	QAA Academic Infrastructure, including the Framework for Higher Education Qualifications and the Code of Practice.		

	<p>UK Quality Code for Higher Education</p> <p>University of Bolton awards framework.</p>
<b>Language of study</b>	English
<b>Mode of study and normal period of study</b>	<p>Full Time – 4 years</p> <p>Part Time – 6 years (with possible exemptions for prior learning at HE4)</p>
<p><b>Admissions criteria</b></p> <p>You should have a minimum of two GCE A2-level passes (or equivalent), including Maths and a Science; and five GCSEs at grade C or above (or equivalent), including English Language.</p> <p>If English is not your first language you will need to complete a Secure English Language Test at IELTS 6.0 or equivalent.</p>	
<p><b>Additional admissions matters</b></p> <p>Non-standard and mature student entry to Part-Time or Full-Time:</p> <ul style="list-style-type: none"> <li>- (HND/C) will be considered for direct entry to HE5 Level given good results in Level 5 Mathematics and Science.</li> <li>- Engineering related work experience and interview (essential for those applying with non-standard entry routes qualifications).</li> </ul> <p>Interviews or informal discussions may be used for Part Time entry students to assess suitability or entry point onto the programme.</p> <p>The first two years of the programme are common to both the MEng and BEng (Hons) routes; hence, given exceptional academic performance at HE4 and into HE5, students may have the opportunity to be counselled for transfer from the BEng (Hons) to the MEng route. However, Masters students who are not able to satisfy the requirements for continuation on the Masters programme, may be counselled to transfer to the BEng (Hons).</p>	
<p><b>Fitness to practise declaration</b></p> <p>Not applicable</p>	
<p><b>Aims of the programme</b></p> <p>This Masters in Automobile Engineering (PT/FT) route is one of four engineering routes within an integrated Masters/BEng(Hons) programme of study. The broad aims of this Masters programme are to:</p> <ul style="list-style-type: none"> <li>• Provide a broad educational base for prospective Chartered Engineers encompassing</li> </ul>	

leadership, social and environmental awareness and economic context together with specialist knowledge and industrial application.

- Educate and develop prospective mechanical engineers to the academic requirements (UK Standards for Professional Engineering Competences (UK-SPEC)) leading to Chartered Engineer status with the Institute of Mechanical Engineers (IMechE).
- Prepare prospective engineers for meaningful professional employment in the Mechanical Engineering sector of industry.
- Prepare prospective engineers for a fruitful and responsible life in society and their community.
- Complete a programme of professional development and training (PDP).
- Provide an integrated programme to achieve delivery efficiency and integration of subject matter. Hence, this Mechanical route integrates with the Automobile routes and BEng(Hons), resulting in combined teaching and timetabling.

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

- motivated to practice 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**

- A purpose-designed route ready for accreditation with IMechE to satisfy CEng registration that is internationally recognised.
- The entire first year cohort joins the IMechE as Affiliate members.
- Projects supported through grants by 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.
- Opportunity to exercise leadership roles in the execution of projects.

- 'Hands-on' Project type modules at all levels of the programme.
- Industrial visits.
- Group and individual industrially relevant projects. Possible 'live' industrial projects.
- 1<sup>st</sup> Yr IMechE Design Challenge for Undergraduate Engineers.
- Opportunity to participate in the IMechE/SAE "Formula Student" challenge.
- Study of a foreign language.
- Open access and skills development in quality CAD, Analysis, Optimisation, CAM and CAE software.

## **Programme learning outcomes**

### UK-SPEC General Learning Outcomes:

On completion of this programme you will:

#### **Understanding & Knowledge**

- demonstrate knowledge and understanding of facts, concepts and theories and underpinning mathematics and science. (K1)
- have an appreciation of the wider multidisciplinary engineering context and its underlying principles (K2)
- appreciate the social, environmental, ethical, economic and commercial considerations affecting the exercise of their engineering judgement (K3)
- have the ability to learn new theories, concepts, methods etc in unfamiliar situations (K4)

#### **Intellectual Ability**

- apply quantitative science and engineering tools to analyse problems (C1)
- be able to demonstrate creative and innovative ability in the synthesis of solutions and in formulating design (C2)
- be able to comprehend the broad picture and thus work with an appropriate level of detail (C3)
- have the ability to develop, monitor and update a plan, to reflect a changing operating environment (C4)

#### **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 (P1)
- demonstrate group working and participation skills in a major project (P2)
- have an understanding of different roles within a team, and the ability to exercise leadership (P3)

### **General Transferable Skills**

- have developed transferable skills including problem solving, communication, leadership, and working with others, as well as the effective use of general IT facilities and information retrieval skills that will be of value in a wide range of situations (T1)
- apply the QCA 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 (T2)
- develop PDP and self learning skills. (T3)
- have the ability to monitor and adjust a personal programme of work on an ongoing basis, and to learn independently. (T4)

(See General Outcomes mapping matrix below)

### **UK-SPEC Specific Learning Outcomes:**

(UKSpec coding in brackets)

### **Underpinning Science & Mathematics and Associate Disciplines**

- have a comprehensive understanding of the scientific principles of mechanical and related engineering disciplines. (US1m)
- have a comprehensive knowledge and understanding of mathematical and computer models relevant to the mechanical and related engineering disciplines, and an appreciation of their limitations. (US2m)
- have an understanding of concepts from a range of areas including some outside engineering, and the ability to apply them effectively in engineering projects. (US3m)
- have an awareness of developing technologies related to mechanical engineering. (US4m)

### **Engineering Analysis**

- have the ability to use fundamental knowledge to investigate new and emerging technologies. (E1m)
- have the ability to extract data pertinent to an unfamiliar problem, and apply its solution using computer based engineering tools when appropriate. (E2m)
- have the ability to apply mathematical and computer-based models for solving problems in engineering, and the ability to assess the limitations of particular cases. (E3m)
- have an understanding of and ability to apply a systems approach to engineering problems. (E40)

### **Design**

- have a wide knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations. (D1m)
- understand customer and user needs and the importance of considerations such as aesthetics. (D2)

- identify and manage cost drivers. (D3)
- have the ability to generate innovative designs for products, systems, components or processes to fulfil new needs. (D4m)
- ensure fitness for purpose for all aspects of the problem including production, operation, maintenance and disposal. (D5)
- manage the design process and evaluate outcomes. (D6)

### **Economic, social and environmental context**

- have the ability to make general evaluations of commercial risks through some understanding of the basis of such risks. (S1m)
- have extensive knowledge and understanding of management and business practices, and their limitations, and how these may be applied appropriately to strategic and tactical issues. (S2m)
- have an Understanding of the requirement for engineering activities to promote sustainable development. (S3)
- have an awareness of the framework of relevant legal requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues. (S4)
- have an understanding of the need for a high level of professional and ethical conduct in engineering. (S5)

### **Engineering Practice**

- have a thorough understanding of current practice and its limitations and some appreciation of likely new developments. (P1m)
- have an extensive knowledge and understanding of a wide range of engineering materials and components. (P2m)
- have an understanding of contexts in which engineering knowledge can be applied (e.g. operations and management, technology, development, etc). (P3)
- understand the use of technical literature and other information sources. (P4)
- have an awareness of nature of intellectual property and contractual issues. (P5)
- have an understanding of appropriate codes of practice and industry standards. (P6)
- have an awareness of quality issues. (P7)
- have the ability to apply engineering techniques taking account of a range of commercial and industrial constraints. (P8m)

(See Learning Outcomes mapping matrix below)

### **Programme structure**

This 4 year full time/6 year part time route requires 480 credits to be achieved for the award MEng in Automobile Engineering; 120 credits at HE4, 120 credits at HE5, 120 credits at HE6 and 120 credits at HE7.

Part time students may study up to 80 credits-worth of modules/year, thus, taking a minimum of six years to complete the route when studied at the maximum rate.

All modules are Core modules and are 20 credit value, apart from the 40 credit Project-type modules (one at each level) required for assimilation and integration of topics and material.

Module Code	Module title	Core/ Option/ Elective (C/O/E)	Credits	Length (1, 2 or 3 periods)
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
AME5002	Mechanics of Materials & Machines	C	20	1
AME5006	Vehicle Sys & Powertrain Tech	C	20	1
AME5004	Engineering Modelling & Analysis	C	20	1
AME5005	Automobile/Mechanical Design	C	20	1
AME6000	MEng Design & Individual Project	C	40	2
AME6002	Advanced Materials & Structures	C	20	1
AME6004	Life Cycle Management	C	20	1
AME6007	Veh Structures & Dynamics	C	20	1
AME6008	Powertrain Tech & Aerodynamics	C	20	1
AME7000	MEng Group Project	C	40	2
AME7001	Language and International Communications for Engineers	C	20	1
AME7002	Managing Product Development	C	20	1
AME7003	STORM	C	20	1
AME7004	Vehicle Crashworthiness & Impact	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 application, assimilation and integration of course material are realised. As projects, design activity and assimilation is extremely important and time dependent, all project modules are 40 credit value and run over two semesters. Also, as you progress through the programme, their studies will become less structured and more open-ended in nature.

### Learning activities (KIS entry)

	Course Year			
	1	2	3	4
Scheduled learning and teaching activities	34	31	24	20
Guided independent study	66	69	76	80
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. The aggregate pass module mark is 40%. You must achieve a pass in all elements of assessment for each module. Summative Assessment may consist of:

- Project, Assignment and/or Design reports
- Written Examinations
- Module Portfolios
- Presentations
- Viva Examination



### Assessment methods (KIS entry)

	Course Year			
	1	2	3	4
Written exams	33%	24%	40%	15%
Coursework	63%	72%	51%	61%
Practical exams	4%	4%	9%	24%

### 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. You must achieve a mark of 40% or above in all assessments to show that you have achieved the Learning Outcomes for each module and achieved an overall average of 40 percent to pass a module.

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/QAECContents/APPR/Home.aspx>

### Grade bands and classifications

#### Grade Bands

Grade Description	Mark %
Work of exceptional quality	70+
Work of very good quality	60-69
Work of good quality	50-59
Work of satisfactory quality	40-49
Borderline fail	35-39

Fail

Below 35

### **Grading**

The award of integrated Masters with Distinction may be made where your overall average mark is at least 70%, normally calculated from modules worth at least 120 credits at Level HE7.

### **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 IMechE

### **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: [www.bolton.ac.uk/Students/Home.aspx](http://www.bolton.ac.uk/Students/Home.aspx)

Students Union [www.ubsu.org.uk/](http://www.ubsu.org.uk/)

Faculty or similar Handbook: <http://www.bolton.ac.uk/Students>

Programme Handbook (add link)

Student Entitlement Statement:

<http://www.bolton.ac.uk/Students/AdviceAndSupport/HomeOLD.aspx>

Module database: <http://modules.bolton.ac.uk>

Moodle (for the programme?) : <http://elearning.bolton.ac.uk>

External examiners reports:

[www.bolton.ac.uk/Quality/QAECContents/ExternalExaminersReports/Home.aspx](http://www.bolton.ac.uk/Quality/QAECContents/ExternalExaminersReports/Home.aspx)

### Document control

<b>Author(s)</b>	Peter J Atkinson
<b>Approved by:</b>	Sarah Riches Chair, University Validation Panel
<b>Date approved:</b>	
<b>Effective from:</b>	2012/13
<b>Document History:</b>	

## UKSpec General Learning Outcomes Map – Masters in Automobile Engineering

Module title	Mod Code	Status C/O/E	K1	K2	K3	K4	C1	C2	C3	C4	P1	P2	P3	T1	T2	T3	T4		
<b>Level 4</b>																			
Engineering Environment	AME4051	C		tda	tda	td			d	d		d	td	tda	d	tda	td		
Engineering Principles 1	AME4052	C	tda			td	tda							d	d				
Engineering Principles 2	AME4053	C	tda			td	tda							d	d				
Projects & Systems	AME4054	C	d	td		d	d	da	d	d	tda	td	td	td	td	td	td		
Graphical Comms & Computer Modelling	AME4055	C		d		d					td			td	d				
<b>Level 5</b>																			
Engineering Applications	AME5001	C	d	td		d	d	da	da	da	tda	tda	tda	td	tda	tda	tda		
Mechanics of Materials & Machines	AME5002	C	tda			tda	tda												
Vehicle Systems & Powertrain Tech	AME5006	C	tda			tda	tda												
Engineering Modelling & Analysis	AME5004	C	tda			tda	tda												
Auto/Mech Design	AME5005	C	d	td	d	td	da	tda	da	d	da	d	td	d	da	td	d		
<b>Level 6</b>																			
MEng Design & Individual Project	AME6000	C	d	tda	da		da	tda	da	tda	td	tda	td	tda	td	tda	da	tda	tda
Advanced Materials & Structures	AME6002	C	tda				tda	tda								d			
Life Cycle Management	AME6003	C		td					da	d						d			d
Vehicle Structures & Dynamics	AME6007	C	tda				tda	tda									d		
Powertrain Technology & Aerodynamics	AME6008	C	tda				tda	tda					tda				d		
<b>Level 7</b>																			
MEng Group Project	AME7000	C	d	tda	d		da	da	da	tda	da	da	tda	tda	d	da	tda		
Language & International Comms for Engineers	AME7001	C		d	tda									d		tda	tda	tda	d
Managing Product Development	AME7002	C		d	d				d	da				tda		d			
STORM	AME7003	C	d	d	d				d	da				td		d			
International Comms & Environmental Issues	AME7005	C		d	tda									d		tda	tda	tda	d
Crashworthiness & Impact Biomechanics	AME7004	C	tda				tda	tda	da				tda				tda		

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# UKSpec Learning Outcomes Map – Masters in Automobile Engineering

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MEng/BEng in Automobile Engineering Modules		Engineering Environment	Engineering Principles 1	Engineering Principles 2	Projects & Systems	Graph'l Comms & Computer Modelling	Engineering Applications	Mechanics of Material & Machines	Vehicle Systems & Powertrain Tech	Engineering Modelling & Analysis	Auto/Mech Design	MEng Design & Individual Project	Advanced Materials & Structures	Life-Cycle Management	Vehicle Structures & Dynamics	Powertrain Technology & Aerodynamics	MEng Group Project	Language & International Comms for Engineers	Managing Product Development	STORM	International Comms & Environmental Issues	Crashworthiness & Impact Biomechanics	
Learning Outcome	UKSpec Code	AME4051	AME4052	AME4053	AME4054	AME4055	AME5001	AME5002	AME5006	AME5004	AME5005	AME6000	AME6002	AME6004	AME6007	AME6008	AME7000	AME7001	AME7002	AME7003	AME7005	AME7004	
<b>Underpinning Science &amp; Mathematics and Associate Disciplines</b>																							
A comprehensive understanding of the scientific principles of mechanical and related engineering disciplines	US1m		dta	dta				dta		dta		d	dta		t	d	tda						d
A comprehensive knowledge and understanding of mathematical and computer models relevant to the mechanical and related engineering disciplines, and an appreciation of their limitations.	US2m		d	dta			d	dta		dta		d			td	dta	tda						tda
An understanding of concepts from a range of areas including some outside engineering, and the ability to apply them effectively in engineering projects.	US3m	d			dta		da				d	tda			d	td	tda		td	d	d	td	
An awareness of developing technologies related to mechanical engineering.	US4m	d			dt		d		d		d	tda	da		tda	td	tda			d	d	td	
<b>Engineering Analysis</b>																							
Ability to use fundamental knowledge to investigate new and emerging technologies.	E1m	d	dta	dta	dt				dat			tda		tda	da			d		d	d	d	
Ability to extract data pertinent to an unfamiliar problem, and apply its solution using computer based engineering tools when appropriate	E2m	d	dta	dta	da		dt	dta	dt	dta	dt	tda			da	ad	tda	d		d	d	da	
Ability to apply mathematical and computer-based models for solving problems in engineering, and the ability to assess the limitations of particular cases.	E3m			d	da		dt	dta	dt	dta	dt	td	dta		da	adt			td			tda	
Understanding of and ability to apply a systems approach to engineering problems	E4	d			da		dta		d		d	td			da			d		da	d	da	
<b>Design</b>																							
Wide knowledge and comprehensive understanding of design processes and methodologies and the ability to apply and adapt them in unfamiliar situations	D1m				d	d	da				dta	tda			tda		tda						
Understand customer and user needs and the importance of considerations such as aesthetics	D2				d	d	da				d	td				d							

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		AME4051	AME4052	AME4053	AME4054	AME4055	AME5001	AME5002	AME5003	AME5004	AME5005	AME6000	AME6002	AME6004	AME6007	AME6008	AME7000	AME7001	AME7002	AME7003	AME7005	AME7004
Identify and manage cost drivers	D3				da	dta	d				t	d			td					da		td
Ability to generate an innovative design for products, systems, components or processes to fulfil new needs.	D4m				da		da				d	tda								d		
Ensure fitness for purpose for all aspects of the problem including production, operation, maintenance and disposal	D5					d			d		dta	td								d		
Manage the design process and evaluate outcomes	D6				da		dta				dta	d							tda	d		
<b>Economic, social and environmental context</b>																						
The ability to make general evaluations of commercial risks through some understanding of the basis of such risks	S1m	dta													dta				d	tda	d	dt
Extensive knowledge and understanding of management and business practices, and their limitations, and how these may be applied appropriately to strategic and tactical issues.	S2m	dt															tda	dta	tda	da	dta	
Understanding of the requirement for engineering activities to promote sustainable development	S3	dta					dt		dt		d	d				td		d		d	dt	
Awareness of the framework of relevant legal requirements governing engineering activities, including personnel, health, safety, and risk (including environmental risk) issues.	S4	dta							dt		d	d				atd		d		d	dta	
Understanding of the need for a high level of professional and ethical conduct in engineering	S5	dt										d			td			d			dta	td
<b>Engineering Practice</b>																						
A thorough understanding of current practice and its limitations and some appreciation of likely new developments	P1m	dt		d			d					tda			d	td	tda	dt			dt	d
Extensive knowledge and understanding of a wide range of engineering materials and components	P2m	dt		dt	d	d	dta	dt			dta	tda	dta		tda		tda	dt			dt	tda
Understanding of contexts in which engineering knowledge can be applied (e.g. operations and management, technology, development, etc)	P3	dt	d	d		dta	dta		d			d			d			dta		da	dt	d
Understanding use of technical literature and other information sources	P4	dt			d	dt					dt	td			t	d		dta			dt	t
Awareness of nature of intellectual property and contractual issues	P5	dt										d						dt		da	dt	
Understanding of appropriate codes of practice and industry standards	P6	dt				dta		dt			tda	d			tda			dt	dt		dt	tda
Awareness of quality issues	P7	dt				dta		d				d			t	t		dt			dt	t
Ability to apply engineering techniques taking account of a range of commercial and industrial constraints	P8m	dt										tda		tda	t		tda	dt		d	dt	t

d – developed; a – assessed; t – taught

## Module listing MEng in Automobile Engineering

Module title	Mod Code	New? ✓	Level	Credits	Type	Core/Option/E lective 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 item
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		CW	55	Y						
Engineering Applications	AME5001		HE5	40	P	C		CW	30		PRA	20		CW	50	Y			
Mechanics of Materials & Machines	AME5002		HE5	20	S	C	AME4052 AME4053	CW	40		EX	60	Y						
Vehicle Systems & Powertrain Tech	AME5006		HE5	20	S	C		CW	50		CW	50	Y						
Engineering Modelling & Analysis	AME5004		HE5	20	S	C	AME4052 AME4053	CW	40		EX	60	Y						
Automobile/Mechanical Design	AME5005		HE5	20	S	C	AME4052 AME4053 AME4055	CW	50		CW	50	Y						
MEng Design & Individual Project	AME6000		HE6	40	P	C	AME5002 AME5005	CW	35		CW	45	Y	PRA	10		PRA	10	
Advanced Materials & Structures	AME6002		HE6	20	S	C		CW	25		EX	75	Y						
Life Cycle Management	AME6003		HE6	20	S	C		CW	75	Y	PRA	25							
Vehicle Structures & Dynamics	AME6007		HE6	20	S	C	AME5002 AME5004 AME5006	CW	25		EX	75	Y						
Powertrain Technology & Aerodynamics	AME6008		HE6	20	S	C	AME5006	CW	50		EX	50	Y						

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MEng Group Project	AME7000		HE7	40	P	C	AME6000	CW	70	Y	PRA	15		PRA	15				
Language & International Comms for Engineers	AME7001		HE7	20	S	C		CW	50		PRA	50	Y						
Managing Product Development	AME7002		HE7	20	S	C		PRA	40		CW	60	Y						
STORM	AME7003		HE7	20	S	C		CW	30		CW	70	Y						
International Comms & Environmental Issues	AME7005		HE7	20	S	C		CW	50		PRA	50	Y						
Crashworthiness & Impact Biomechanics	AME7004		HE7	20	S	C	AME6007	CW	25		EX	75	Y						

## Bolton Values Map – Masters in Automobile Engineering

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MEng/BEng in Automobile Engineering Modules	Engineering Environment	Engineering Principles 1	Engineering Principles 2	Projects & Systems	Graph'l Comms & Computer Modelling	Engineering Applications	Mechanics of Material & Machines	Vehicle Systems & Powertrain Tech	Engineering Modelling & Analysis	Auto/Mech Design	MEng Design & Individual Project	BEng Design & Individual Project	Advanced Materials & Structures	Management & Enterprise in Engineering	Life-Cycle Management	Vehicle Structures & Dynamics	Powertrain Technology & Aerodynamics	MEng Group Project	Language & International Comms for Engineers	Managing Product Development	STORM	International Comms & Environmental Issues	Crashworthiness & Impact Biomechanics	
Value	AME4051	AME4052	AME4053	AME4054	AME4055	AME5001	AME5002	AME5006	AME5004	AME5005	AME6000	AME6001	AME6002	AME6003	AME6004	AME6007	AME6008	AME7000	AME7001	AME7002	AME7003	AME7005	AME7004	
<b>Employability</b>																								
Communication	dta	d	d	da	tda	da	d	da	d	td	tda	tda	tda	dt	td	td	da	tda	dta	da	dt	dta	t,d	
Team Work	d			da		da		d		td				dt		td		tda	d	d	d	d	t,d	
Organisation & Planning	d			dt		d		td			tda	tda		dta		td	d	tda	d	tda	dta	d	t,d	
Numerical Interpretation		dta	dta	da		da	dta	tda	dta	tda	tda	tda	tda		tda	tda	tda	tda					t,d,a	
Problem Solving		dta	dta	da	d	da	dta	d	dta	tda	tda	tda	tda		tda	tda	ad	tda		t	da		t,d,a	
Flexibility & Adaptability	d										d	d		dt					dt		d	d		
Action Planning	d			dt		d					tda	tda		dt				da	d	tda	d	d		
Self Awareness	dta										d	d		dt			d	d	d			d		
Initiative	d			d		d					d	d		dt			ad	d	dt			d	d	
Personal Impact & Confidence	d										d	d		dt		d		d	dt	tda	d	d	d	
<b>Internationalisation</b>																								
International content or international comparative approach	d							t						dt		tda			dt		dt	dt	t,d,a	
Preparation for international profession	d	d	d				d	at	d	d	d	d	td	dt	d	d	tda	d	dt	d		dt	d	
Foreign language or cross-cultural communication																			dta					
Preparation for internationally recognised qualification	d	d	d	dt		dt	d	d	d	t	d	d	d	dt	d	t	da	d	dt	d		dt	t	
<b>Environmental Sustainability &amp; Awareness</b>																								
Globalisation & the global context	d							td						dta	d		d	d	d		dta	dta		
Consumer culture and the free market	d										d			dt				d				dt		
Carbon reduction		d	d				d	t	d		d		d		dt	d	tda					dt	d	
Systems, control mechanisms and environments	d			da		da		td						dt	dta	d			d		dt	dt	d	
Energy, consumption, waste and technology	d	dt	dt	d			dt	t	dt	d	d	d	d	dt	dta		tda				dt	dt		
Business impact and business practices on the environment	d									td				dt			d	d	d	td	dta	dta		
Instrumentation and stewardship								d												d				
<b>Social, Public &amp; Ethical Responsibility</b>																								
Professional standards and practice	d	dt	dt	d	td		dt	tda	dt	d	d			dt		d		d	d	d		dt	d	
Ethics	d										d			dt		td	da		d			dt	dt	
Political or social judgement	d										d			dt			tda		d	d		dt		
Cultural or moral issues	d										d			dt			tda		d	d	dta	dt		