

Course Specification

Course Summary Information				
1	Course Titles		BEng (Hons) Automotive Engineering BEng (Hons) Automotive Engineering with Professional Placement Year MEng Automotive Engineering MEng Automotive Engineering with Professional Placement Year	
2	BCU Course Codes	UCAS Codes	BEng (Hons) US0822 MEng UM0022	H330 H3H0
3	Awarding Institution		Birmingham City University	
4	Teaching Institution(s) (if different from point 3)			
5	Professional Statutory or Regulatory Body (PSRB) accreditation (if applicable)		The Institution of Engineering and Technology (IET)	

6	Course Description
	<p>Study our Automotive Engineering BEng degree course and join one of the select UK universities to take part in Formula Student events at Silverstone.</p> <p>Now is a fascinating time to study automotive engineering as you will have the chance to be at the forefront of developments within the industry. You will get to work in advanced automotive workshops and laboratories equipped with industry-standard equipment, as well as take advantage of more traditional office-based facilities.</p> <p>We ensure you gain practical experience, in particular via our BCU Formula Student racing team, so that you are equipped to apply engineering science to real life situations.</p> <p>What's covered in the course?</p> <p>Our Automotive Engineering course is designed to develop you as an engineer able to make a significant contribution to this industry as it goes through an important period of transition in the UK and globally.</p> <p>Our engineering courses focus on project-based activities, giving you lots of opportunity to work in teams on projects from design to implementation. This will give you practical experience of applying engineering science to real world problems, working in multidisciplinary teams to develop your interpersonal skills, and prepare you for a key aspect of modern engineering practice.</p> <p>You will develop key technical skills, enhance your creative thinking and learn from industry experts. As well as gaining knowledge and application skills in powertrain systems, suspension, body engineering, stress analysis, design and management.</p> <p>We will provide a stimulating environment with lots of opportunity to collaborate with your colleagues, enhance your creativity and develop the attributes you need to stand out from the crowd.</p>

Our automotive engineering degree is structured so that its themes have a direct relevance to the industry's current and expected future needs, and upon graduating you will have the intellectual, technical and personal qualities necessary to successfully implement new technologies.

Throughout your course you will benefit from our strong industry links with companies such as the Morgan Motor Company, Westfield Sportscars, Siemens, and GKN.

You will also have the opportunity to join our BCU Formula Student racing team, which designs and builds a single-seater racing car each year to race in July at the IMechE-sponsored event at Silverstone.

Specifically, this course will develop your skills in the key areas of:

- Academic education, focusing on the technology, design, project management, manufacture and health and safety pertaining to the relevant industries associated with modern automotive engineering.
- Becoming a competent engineer by being able to tackle engineering needs and problems associated with products systems, processes and components within the automotive engineering discipline.
- Reflection on and evaluate your learning and technical achievements and performance to clearly identify your proposed professional intent.
- Mechanical technology, including mechanical methodologies, methods, techniques and current / developing theories and conceptual ideas.
- Mechanical engineering, science and applied mathematics.
- Digital and Design Technologies, which will include developing your skills in the areas of CAD, CAM and analytical software.
- Communication and interpersonal skills, including written, verbal and new media presentation skills as well as working with others.
- The role of engineers in enabling the transition to smart and zero emission vehicles, developing sustainable transport and creating a sustainable and ethical environment.

Course aims

The content and structure of the course are designed to provide you with an academically challenging and vocationally relevant degree, which encompasses all aspects of successfully entering and progressing their career within the automotive engineering.

Furthermore, the courses have clearly identifiable core themes, with significant elements of practical based learning.

The course aims to:

- Provide you with the appropriate intellectual tools to be able to operate effectively as an engineer, within the multidisciplinary engineering environment of automotive based organisations.
- Provide a challenging undergraduate course and to meet the needs of the relevant industries.
- Provide appropriate practical engineering opportunities, combining theory and experience, to enable students to become engineers with awareness, knowledge, skills, and an understanding of a range of experience of engineering practice, as well as the economic, social and environmental context of industrial technology within the automotive engineering area.
- Extend your confidence and professionalism in high-level communication tools and to develop interpersonal and team working skills to be able to contribute effectively to business activities.

- Develop your ability to reflect on and evaluate your learning and technical achievements and performance in order to clearly identify your proposed professional aim and enables you to develop critical evaluation and apply appropriate engineering solutions.
- Enables you to fulfil the role of a competent engineer by being able to tackle automotive engineering needs and problems associated with production systems, processes and components.
- In addition, you will develop knowledge, understanding and skills in drivetrain systems, suspension and body engineering, stress analysis, design and management relevant to automotive industries.
- Focus on the application of industry-standard design, modelling and simulation techniques to the analysis, specification and implementation of automotive engineering systems.
- Demonstrate the ability to understand the importance of developing a range of skills associated with cooperation and collaboration when working across disciplines.
- Undertake group work and project-based challenges that enable you to compete for a variety of employment opportunities within the automotive engineering and associated industries.
- Demonstrate a consideration of the wider aspects and global impact of your discipline and an ability to contribute to the engineering sector in different international contexts.

Progression to MEng Automotive Engineering

This course offers the option to progress to the MEng Mechanical Engineering. This allows you to undertake an additional year of study at postgraduate level, following successful completion of your BEng course. If you choose to progress to an MEng, you will be able to apply to transfer during your second year of study.

At this level, you are expected to have a more comprehensive understanding of science and mathematics, a greater degree of critical awareness of current societal problems, ability to collect data and undertake engineering analysis to solve complex issues, and the ability to generate innovate and sustainable designs.

7	Course Awards		
7a	Possible Final Awards for the Automotive Engineering course	Level	Credits Awarded
	For BEng (Hons): Bachelor of Engineering with Honours Automotive Engineering Bachelor of Engineering with Honours Automotive Engineering with Professional Placement Year	6 6	360 480
	For MEng: Integrated Masters of Engineering Automotive Engineering Integrated Masters of Engineering Automotive Engineering with Professional Placement Year	7 7	480 600
7b	Exit Awards and Credits Awarded		
	Certificate of Higher Education Automotive Engineering	4	120
	Diploma of Higher Education Automotive Engineering	5	240
	Bachelor of Engineering Automotive Engineering	6	300

8	Derogations from the University Regulations
	<ol style="list-style-type: none"> 1. A maximum volume of 30 credits per course in a Bachelor's or Integrated Master's degree can be compensated, except that any compensation of Level 3 modules is not included in that limit. 2. A maximum volume of 20 credits per course in a Master's degree (other than an integrated Master's degree) can be compensated. 3. No condonement of modules at Levels 4-7 is permitted. 4. Where appropriate, a stage mean of at least 50% is required for students to progress from Bachelor's level (Level 6) on to the final stage of an Integrated Master's degree (Level 7), or to transfer course from a relevant Bachelor's degree to an Integrated Master's degree.

9	Delivery Patterns		
Mode(s) of Study	Location	Duration of Study	Code
BEng (Hons) Full Time	City Centre	3 years	US0822
BEng (Hons) With Professional Placement Year	City Centre	4 years	US1156
BEng (Hons) Part Time	City Centre	5 years	US0664
MEng Full Time	City Centre	4 years	UM0022
MEng With Professional Placement Year	City Centre	5 years	UM0070
MEng with Foundation and Professional Placement Year	City Centre	6 years	UM0072
Full Time Level 6 Top-Up	BCU UAE	1 year	US1176
BEng (Hons) Full Time	BCU UAE	3 years	US1434

10	Entry Requirements
	<p>The admission requirements for this course are stated on the course page of the BCU website at https://www.bcu.ac.uk/ or may be found by searching for the course entry profile located on the UCAS website.</p>

11 Course Learning Outcomes						
The following table shows how the UK SPEC Learning Outcomes mapped against the 5 University’s Key Themes.						
UK SPEC Learning Outcomes		Pursuing Excellence	Practice Led Knowledge Applied	Interdisciplinary	Employability Driven	Internationalisation
A. Knowledge & Understanding						
A1	Maintain and extend a sound theoretical approach in enabling the introduction and exploitation of new and advancing technology in the field of Automotive Engineering	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
A2	Engage in the creative and innovative development of automotive engineering technology and continuous improvement systems.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B. Design and Development of processes, systems, services and products						
B1	Identify potential projects and opportunities.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B2	Conduct appropriate research and undertake design and development of engineering solutions within the design and development field.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
B3	Manage implementation of design solutions and evaluate their effectiveness.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
C. Responsibility, management and leadership						
C1	Plan for effective project implementation.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C2	Plan, budget, organise, direct and control tasks, people and resources.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C3	Lead teams and develop staff to meet changing technical and managerial needs.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
C4	Bring about continuous improvement through quality management.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
D. Communication and interpersonal skills						
D1	Communicate in English with others at all levels.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D2	Present and discuss proposals.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
D3	Demonstrate personal and social skills.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E. Professional Commitment						
E1	Comply with relevant codes of conduct.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E2	Manage and apply safe systems of work.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E3	Undertake engineering activities in a way that contributes to sustainable development.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
E4	Carry out and record CPD necessary to maintain and enhance competence in own area of practice	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
E5	Exercise responsibilities in an ethical manner.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

The Course Learning Outcomes are articulated per each level in terms of:

- Knowledge and understanding
- Intellectual skills
- Practical/subject specific skills
- Transferable skills.

At Level 4 you will illustrate your succession from familiarity and working understanding to a wider appreciation, application and deeper understanding at Level 5. At Level 6 you will illustrate your ability to independently apply knowledge, skills and understanding, with a focus on active and reflective practice and clear evidence of synthesis and integration of the various skills and knowledge acquired throughout the course. The Level 6 learning outcomes are designed for you to propose and carry out individual study courses in design and research that fully explore your analytical, creative and innovative problem-solving potential. Your achievement of learning outcomes is an incremental and progressive by its nature as your advance through course of study, hence only Level 6 learning outcomes are listed below, demonstrating a threshold level of performance expected of all Honours graduates. At Level 7, a higher appreciation is required especially regarding leadership and teamwork. At this level you expected to have a more comprehensive understanding of science and mathematics, a greater degree of critical awareness of current societal problems, ability to collect data and undertake engineering analysis to solve complex issues, able to generate innovate and sustainable designs and have a higher generic abilities.

Appendix 1 shows the precise Level 4, 5, 6 and 7 modules alignment with the learning outcomes that is to be considered in terms of the overall progression through all levels of study.

Knowledge and understanding:

Level 4

On successful completion of the course, you must be able to demonstrate:

- Appropriate mathematical techniques, including algebra, trigonometry, calculus, statistics and probability
- The principle of automotive engineering and their application in simple engineering science
- Understand, apply and evaluate engineering science and engineering analysis procedure to solve the engineering problems.
- Safe working practices, risk assessment.

Level 5

On successful completion of the course, you must be able to demonstrate:

- In depth Knowledge and understanding of essential facts, concepts, theories and principles of automotive engineering, and its underpinning science and mathematics.
- Appreciation of the wider multidisciplinary engineering context and its underlying principles.
- In depth Knowledge of the social, environmental, ethical, economic and commercial considerations affecting the exercise of their engineering judgement.
- Computer-Based Design and modelling include its applications.

Level 6

On successful completion of the course, you must be able to demonstrate:

- Project management, business management, environmental issue and ethics as applied to professional engineering.
- Selection, critical evaluation, implementation and presentation of an engineering project
- Appraisal of the design, construction and performance envelop of automotive engineering technologies and systems.

- Critical analysis and problem solving of an automotive based project

Level 7

On successful completion of the course, you must be able to demonstrate:

- The scientific principles of Automotive Engineering to an advanced level.
- Further mathematical and computer models relevant to the automotive engineer to a comprehensive level and an appreciation of their limitations.
- Management and business practices and their limitations as applied to strategic and tactical issues as appropriate for Chartered Engineers.

Intellectual Abilities:

Level 4

On successful completion of the course, you must be able to:

- Apply appropriate quantitative science and engineering tools to the analysis of problems.
- Demonstrate creative and innovative ability in the synthesis of solutions and in formulating designs.
- Comprehend the broad picture and thus work with an appropriate level of detail.
- Investigate simple automotive problem with appropriate mathematical methods.

Level 5

On successful completion of the course, you must be able to:

- Analyse and use appropriate advanced automotive engineering principles to solve wide range of problems.
- Use of Computer Aided Design and engineering analysis tools.
- Identify and evaluate relevant practices within an appropriate professional and ethical framework.
- Evaluate and apply automotive problem solving that can assist in the engineering process.

Level 6

On successful completion of the course, you must be able to:

- Critical analysis of working practices to ensure safety, carry out risk assessment and apply appropriate safety management techniques.
- Identify and critically evaluate relevant practices within an appropriate professional and ethical framework.
- Ability to analyse, evaluate and recommend design solutions to meet client's requirements.
- Identify the constraint of an engineering project.

Level 7

On successful completion of the course, you must be able to:

- Use fundamental knowledge to investigate new technologies.
- Apply advanced mathematical and computer-based models for solving complex problems in engineering, and the ability to assess the limitations of particular cases.
- Extract data pertinent to an unfamiliar problem, and effect solutions using computer-based engineering tools when appropriate.
- Debate contemporary issues in Automotive Engineering.
- Critically discuss the importance of Automotive Engineering on a global scale.

Practical / Subject Specific skills:**Level 4**

On successful completion of the course, you must be able to:

- 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.
- Provide evidence of group working and of participation in projects.
- Apply safe working procedures, health & safety legislation, risk assessment and risk management techniques.
- Communicate effectively by written, visual and oral means.

Level 5

On successful completion of the course, you must be able to:

- Apply safe working practices to the automotive engineering-based laboratory work.
- Use a Computer Aided Design package in a design process
- Interpret written and design information for areas of more complex work

Level 6

On successful completion of the course, you must be able to:

- Apply project planning techniques and scheduling methods
- Identify and critically evaluate the tasks required to complete an automotive project/product in conjunction with a customer's needs
- Manage empirically-research based project under appropriate supervision and recognise of its theoretical, practical and methodology
- Able to summarise, accurately, the arguments presented in a range of complex works within and about automotive engineering specific subject.

Level 7

On successful completion of the course, you must be able to:

- Use wide knowledge and comprehensive understanding of design processes and methodologies and apply and adapt them in unfamiliar situations.
- Generate ground-breaking designs for products, systems, or components
- Evaluate the impact of regulatory, commercial and environmental constraints on processes and products.

General transferable skills:

On successful completion of the course, you must be able to:

- 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 [information technology] facilities and information retrieval skills.
- Demonstrate evidence of planning, self-learning and improving performance, as the foundation for lifelong learning/CPD [continuing professional development].
- Communicate effectively with other people using oral, written and graphic means.
- Apply safe working procedures, health & safety legislation, risk assessment and risk management techniques.
- Have ability and competence in a range of skills on the current CAD and IT equipment in an effective and productive manner.
- Show initiative, work independently and able to work as member of a team to develop collaborative skills.
- Display resourceful solutions including use of advanced engineering tools to the limitations of current Automotive Engineering practice and discuss them in a major technical report.

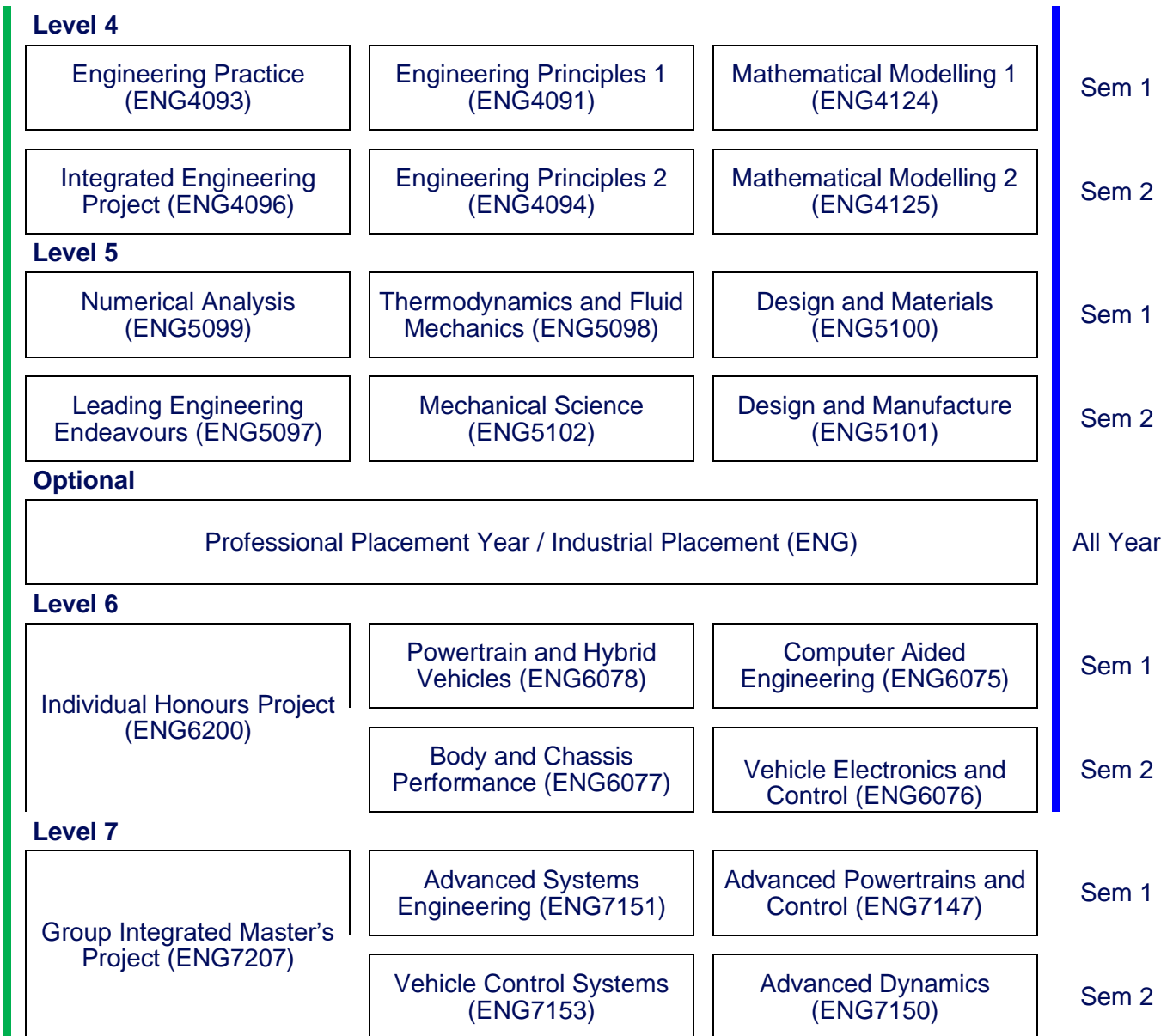
12	Course Requirements: BEng / MEng		
12a	Level 4: <i>To complete this course, you must successfully complete all the following CORE modules (totalling 120 credits):</i>		
	Module Code	Module Name	Credit Value
	ENG4091	Engineering Principles 1	20
	ENG4124	Mathematical Modelling 1	20
	ENG4093	Engineering Practice	20
	ENG4094	Engineering Principles 2	20
	ENG4125	Mathematical Modelling 2	20
	ENG4096	Integrated Engineering Project	20
	Level 5: <i>To complete this course, you must successfully complete all the following CORE modules (totalling 120 credits):</i>		
	Module Code	Module Name	Credit Value
	ENG5098	Thermodynamics and Fluid Mechanics	20
	ENG5099	Numerical Analysis	20
	ENG5100	Design and Materials	20
	ENG5097	Leading Engineering Endeavours	20
	ENG5101	Design and Manufacture	20
ENG5102	Mechanical Science	20	
Professional Placement Year (optional)			
<i>To qualify for the award of Bachelor of Engineering with Automotive Engineering with Professional Placement Year or Integrated Master of Engineering Automotive Engineering with Professional Placement Year, you must successfully complete all of the modules listed as well as the following Level 5 module:</i>			
Module Code	Module Name	Credit Value	
PPY5004	Professional Placement	120	
Level 6: <i>To complete this course, you must successfully complete all the following CORE modules (totalling 120 credits):</i>			
Module Code	Module Name	Credit Value	
ENG6075	Computer Aided Engineering	20	
ENG6076	Vehicle Electronics and Control	20	
ENG6077	Body and Chassis Performance	20	
ENG6078	Powertrain and Hybrid Vehicles	20	
ENG6200	Individual Honours Project	40	

Level 7:

To complete this course, you must successfully complete all the following CORE modules (totalling 120 credits):

Module Code	Module Name	Credit Value
ENG7147	Advanced Powertrains and Control	20
ENG7151	Advanced Systems Engineering	20
ENG7153	Vehicle Control Systems	20
ENG7150	Advanced Dynamics	20
ENG7207	Group Integrated Master's Project	40

12b Structure Diagram



Course Routes:

- BEng (Hons) Automotive Engineering
- MEng Automotive Engineering Route

Part-Time Delivery - Automotive Engineering

Year 1

Engineering Principles 1 (ENG4091)	Mathematical Modelling 1 (ENG4124)	Sem 1
Engineering Principles 2 (ENG4094)		Sem 2

Year 2

Engineering Practice (ENG4093)		Sem 1
Integrated Engineering Project (ENG4096)	Mathematical Modelling 2 (ENG4125)	Sem 2

Year 3

Numerical Analysis (ENG5099)	Thermodynamics and Fluid Mechanics (ENG5098)	Sem 1
Mechanical Science (ENG5102)	Leading Engineering Endeavours (ENG5097)	Sem 2

Year 4

Computer Aided Engineering (ENG6075)	Design and Materials (ENG5100)	Sem 1
Body and Chassis Performance (ENG6077)	Design and Manufacture (ENG5101)	Sem 2

Year 5

Individual Honours Project (ENG6200)	Powertrain and Hybrid Vehicles (ENG6078)	Sem 1
	Vehicle Electronics and Control (ENG6076)	Sem 2

Top-Up Part-Time Delivery – Automotive Engineering

Year 1 – Year 3

**Accreditation of Prior Learning (APL)
Examples (HND; Foundation Degree, etc.)**

Year 4

Computer Aided Engineering (ENG6075)	Powertrain and Hybrid Vehicles (ENG6078)	Sem 1
Body and Chassis Performance (ENG6077)	Vehicle Electronics and Control (ENG6076)	Sem 2

Year 5

Individual Honours Project (ENG6200)		Sem 1
		Sem 2

UAE Delivery (Full Time)
Level 4

Engineering Practice (ENG4093)	Engineering Principles 1 (ENG4091)	Mathematical Modelling 1 (ENG4124)	Sem 1
Integrated Engineering Project (ENG4096)	Engineering Principles 2 (ENG4094)	Mathematical Modelling 2 (ENG4125)	Sem 2

Level 5

Numerical Analysis (ENG5099)	Thermodynamics and Fluid Mechanics (ENG5098)	Design and Materials (ENG5100)	Sem 1
Leading Engineering Endeavours (ENG5097)	Mechanical Science (ENG5102)	Design and Manufacture (ENG5101)	Sem 2

Optional

Professional Placement Year / Industrial Placement (ENG)	All Year
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Level 6

Individual Honours Project (ENG6200)	Powertrain and Hybrid Vehicles (ENG6078)	Computer Aided Engineering (ENG6075)	Sem 1
	Body and Chassis Performance (ENG6077)	Vehicle Electronics and Control (ENG6076)	Sem 2

UAE Delivery (Level 6 Top-Up)

Level 6

Individual Honours Project (ENG6200)	Powertrain and Hybrid Vehicles (ENG6078)	Computer Aided Engineering (ENG6075)	Sem 1
	Body and Chassis Performance (ENG6077)	Vehicle Electronics and Control (ENG6076)	Sem 2

13 Overall Student Workload and Balance of Assessment

Overall student *workload* consists of class contact hours, independent learning and assessment activity, with each credit taken equating to a total study time of around 10 hours. While actual contact hours may depend on the optional modules selected, the following information gives an indication of how much time students will need to allocate to different activities at each level of the course.

- *Scheduled Learning* includes lectures, practical classes and workshops, contact time specified in timetable
- *Directed Learning* includes placements, work-based learning, external visits, on-line activity, Graduate+, peer learning
- *Private Study* includes preparation for exams

The *balance of assessment* by mode of assessment (e.g. coursework, exam and in-person) depends to some extent on the optional modules chosen by students. The approximate percentage of the course assessed by coursework, exam and in-person is shown below.

Level 4

Workload

44% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	528
Directed Learning	336
Private Study	336
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Coursework	33%
Exam	43%
In-Person	23%

Level 5

Workload

24% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	288
Directed Learning	192
Private Study	720
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Coursework	60%
Exam	35%
In-Person	5%

Level 6

Workload

19% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	232
Directed Learning	224
Private Study	744
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Coursework	46%
Exam	54%
In-Person	0%

Level 7

Workload

15% time spent in timetabled teaching and learning activity

Activity	Number of Hours
Scheduled Learning	184
Directed Learning	132
Private Study	884
Total Hours	1200

Balance of Assessment

Assessment Mode	Percentage
Coursework	81%
Exam	0%
In-Person	19%

Appendix 1

Curriculum Mapping

Course Learning Outcomes Vs Specific Modules

LEVEL 4	Engineering Principles 1	Mathematical Modelling 1	Engineering Practice	Engineering Principles 2	Mathematical Modelling 2	Integrated Engineering project
General Learning Outcome						
Knowledge and Understanding						
The principle of automotive engineering and their application in simple engineering science	✓		✓	✓		✓
Apply and use appropriate mathematical techniques, including algebra, trigonometry, calculus and probability.		✓			✓	
Understand, apply and evaluate engineering science and engineering analysis procedure to solve the engineering problems.	✓	✓	✓			✓
Safe working practices, risk assessment		✓				✓
Intellectual Abilities						
Apply appropriate quantitative science and engineering tools to the analysis of problems.	✓	✓		✓	✓	
Demonstrate creative and innovative ability in the synthesis of solutions and in formulating designs			✓			✓
Comprehend the broad picture and thus work with an appropriate level of detail.		✓			✓	✓
Investigate simple automotive problem with appropriate mathematical methods.		✓	✓		✓	✓
Practical / Subject Specific 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.		✓				✓
Provide evidence of group working and of participation in a major project is expected. However, individual professional bodies may require particular approaches to this requirement.		✓				✓
Apply safe working procedures, health & safety legislation, risk assessment and risk management techniques.		✓				✓
Communicate effectively by written, visual and oral means	✓	✓	✓	✓	✓	✓

LEVEL 4	Engineering Principles 1	Mathematical Modelling 1	Engineering Practice	Engineering Principles 2	Mathematical Modelling 2	Integrated Engineering project
General Learning Outcome						
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 [information technology] facilities and information retrieval skills.		✓	✓		✓	✓
Demonstrate evidence of planning, self-learning and improving performance, as the foundation for lifelong learning/CPD [continuing professional development].			✓			✓
Communicate effectively with other people using oral, written and graphic means			✓			✓
Apply safe working procedures, health & safety legislation, risk assessment and risk management techniques			✓			✓
Ability to use competent in a range of skills on the current CAD and IT equipment in an effective and productive manner.			✓			✓
Show initiative, work independently and able to work as member of a team to develop collaborative skills		✓	✓		✓	✓
Display resourceful solutions including use of advanced engineering tools to the limitations of current Automotive Engineering practice and discuss them in a major technical report.	✓			✓		

LEVEL 5	Thermodynamics and Fluid Mechanics	Numerical Analysis	Design and Material	Mechanical Science	Leading Engineering Endeavours	Design and Manufacture
General Learning Outcome						
Knowledge and Understanding						
In depth Knowledge and understanding of essential facts, concepts, theories and principles of your engineering discipline, and its underpinning science and mathematics.	✓	✓		✓		
Appreciation of the wider multidisciplinary engineering context and its underlying principles.					✓	
In depth Knowledge of the social, environmental, ethical, economic and commercial considerations affecting the exercise of their engineering judgement			✓		✓	
Computer-Based Design and modelling include its applications.		✓	✓			✓
Intellectual Abilities						
Analyse and use appropriate advanced automotive engineering principles to solve wide range of problems	✓			✓		
Use of Computer Aided Design and engineering analysis tools		✓	✓			✓
Identify, evaluate and apply relevant practices within an appropriate professional and ethical framework			✓		✓	
Evaluate and apply automotive problem solving that can assist in the engineering process	✓		✓	✓		✓

LEVEL 5	Thermodynamics and Fluid Mechanics	Numerical Analysis	Design and Material	Mechanical Science	Leading Engineering Endeavours	Design and Manufacture
General Learning Outcome						
Practical / Subject Specific skills						
Apply safe test to the automotive based laboratory task.			✓			✓
Use a Computer Aided Design package in a design process			✓			✓
Interpret written and design information for areas of more complex work			✓	✓		✓
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 [information technology] facilities and information retrieval skills.	✓	✓	✓	✓	✓	✓
Demonstrate evidence of planning, self-learning and improving performance, as the foundation for lifelong learning/CPD [continuing professional development].			✓		✓	✓
Communicate effectively with other people using oral, written and graphic means			✓		✓	✓
Apply safe working procedures, health & safety legislation, risk assessment and risk management techniques						✓
Ability to use competent in a range of skills on the current CAD and IT equipment in an effective and productive manner.		✓	✓			✓
Show initiative, work independently and able to work as member of a team to develop collaborative skills			✓		✓	✓
Display resourceful solutions including use of advanced engineering tools to the limitations of current Automotive Engineering practice and discuss them in a major technical report.	✓					✓

LEVEL 6	Vehicle Electronics and Control	Computer Aided Engineering	Body and Chassis Performance	Powertrain and Hybrid vehicles	Undergraduate Individual Honours Project
General Learning Outcome					
Knowledge and Understanding					
Project management, business management, environmental issue and ethics as applied to professional engineering.					✓
Selection, critical evaluation, implementation and presentation of an engineering project		✓		✓	✓
Appraisal of the design, construction and performance envelop of automotive engineering technologies and systems.	✓		✓	✓	
Critical analysis and problem solving of automotive based project	✓				✓
Intellectual Abilities					
Critical analysis of working practices to ensure safety, carry out risk assessment and apply appropriate safety management techniques					✓
Identify and critically evaluate relevant practices within an appropriate professional and ethical framework	✓		✓		✓
Ability to critically analyse, evaluate and recommend design solutions to meet client's requirements	✓		✓	✓	
Identify and critically evaluate the constraint of an engineering project					✓

LEVEL 6	Vehicle Electronics and Control	Computer Aided Engineering	Body and Chassis Performance	Powertrain and Hybrid vehicles	Undergraduate Individual Honours Project
General Learning Outcome					
Practical / Subject Specific skills					
Apply project planning techniques and scheduling methods					✓
Identify and critically evaluate the tasks required to complete an automotive project/product in conjunction with a customers' needs	✓			✓	✓
Manage empirically-research based project under appropriate supervision and recognise of its theoretical, practical and methodology		✓			✓
Evaluate and critically summarise accurately the arguments presented in a range of complex works within and about automotive engineering specific subject.	✓		✓	✓	
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 [information technology] facilities and information retrieval skills.	✓			✓	✓
Demonstrate evidence of planning, self-learning and improving performance, as the foundation for lifelong learning/CPD [continuing professional development].					✓
Communicate effectively with other people using oral, written and graphic means					✓
Apply safe working procedures, health & safety legislation, risk assessment and risk management techniques	✓			✓	✓
Ability to use competent in a range of skills on the current CAD and IT equipment in an effective and productive manner.	✓		✓	✓	
Show initiative, work independently and able to work as member of a team to develop collaborative skills					✓
Display resourceful solutions including use of advanced engineering tools to the limitations of current Automotive Engineering practice and discuss them in a major technical report.					✓

LEVEL 7	Advanced Powertrain and Control	Advanced Systems Engineering	Advanced Dynamics	Vehicle Control Systems	Group Integrated Masters Project
General Learning Outcome					
Knowledge and Understanding					
The scientific principles of Automotive Engineering to an advanced level.	✓	✓	✓	✓	✓
Further mathematical and computer models relevant to the automotive engineer to a comprehensive level and an appreciation of their limitations.	✓	✓		✓	
Management and business practices and their limitations as applied to strategic and tactical issues as appropriate for Chartered Engineers.					✓
Design methodology appropriate to automotive engineering	✓		✓	✓	
Intellectual Abilities					
Use fundamental knowledge to investigate new technologies.	✓	✓		✓	
Apply advanced mathematical and computer based models for solving complex problems in engineering, and the ability to assess the limitations of particular cases.	✓		✓	✓	
Extract data pertinent to an unfamiliar problem, and effect solutions using computer based engineering tools when appropriate.					✓
Debate contemporary issues in Automotive Engineering					✓
Critically discuss the importance of Automotive Engineering on a global scale		✓			

LEVEL 7	Advanced Powertrain and Control	Advanced Systems Engineering	Advanced Dynamics	Vehicle Control Systems	Group Integrated Masters Project
General Learning Outcome					
Practical / Subject Specific skills					
Use wide knowledge and comprehensive understanding of design processes and methodologies and apply and adapt them in unfamiliar situations.	✓		✓	✓	
Generate ground-breaking designs for products, systems, or components	✓			✓	
Evaluate the impact of regulatory, commercial and environmental constraints on processes and products.					✓
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 [information technology] facilities and information retrieval skills.	✓	✓	✓	✓	
Demonstrate evidence of planning, self-learning and improving performance, as the foundation for lifelong learning/CPD [continuing professional development].					✓
Communicate effectively with other people using oral, written and graphic means		✓			✓
Apply safe working procedures, health & safety legislation, risk assessment and risk management techniques					✓
Ability to use competent in a range of skills on the current CAD and IT equipment in an effective and productive manner.	✓			✓	
Show initiative, work independently and able to work as member of a team to develop collaborative skills					✓
Display resourceful solutions including use of advanced engineering tools to the limitations of current Automotive Engineering practice and discuss them in a major technical report.	✓	✓	✓	✓	

