

School of Engineering and Computer Science


Title of Programme: Engineering Degree Apprenticeship (Automotive)

Programme Code: ENDAAU

Programme Specification

This programme specification is relevant to students entering:
23 September 2019

Associate Dean of School (Academic Quality Assurance):
Susan Murray



Signature

A programme specification is a collection of key information about a programme of study (or course). It identifies the aims and learning outcomes of the programme, lists the modules that make up each stage (or year) of the programme, and the teaching, learning and assessment methods used by teaching staff. It also describes the structure of the programme, its progression requirements and any programme-specific regulations. This information is therefore useful to potential students to help them choose the right programme of study, to current students on the programme, and to staff teaching and administering the programme.

Summary of amendments to the programme:

Section	Amendment
Section D Page 8	4ENT1067 updated assessment weighting
Section D page 10	Degree without honours requires 300 credits "excluding Individual Project".
Section E and F	Text modified to latest template, web pages hyperlinks updated
Section D	Module code 5ENT1013 Dynamics updated to 5ENT1114

If you have any queries regarding the changes please email AQO@herts.ac.uk

Programme Specification

Engineering Degree Apprenticeship (Automotive)

This programme specification (PS) is designed for prospective students, enrolled students, academic staff and potential employers. It provides a concise summary of the main features of the programme and the intended learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the teaching, learning and assessment methods, learning outcomes and content for each module can be found in Definitive Module Documents (DMDs) and Module Guides.

Section 1

Awarding Institution/Body	University of Hertfordshire
Teaching Institution	University of Hertfordshire
University/partner campuses	College Lane
Programme accredited by	Institution of Mechanical Engineers
Final Qualification	BEng (Hons)
All Final Award titles	Automotive Engineering
(Qualification and Subject)	Automotive Engineering with Motorsport
FHEQ level of award	6
UCAS code(s)	H330/H335
Language of Delivery	English

A. Programme Rationale

A degree apprenticeship enables an apprentice to gain a degree without the need to take out a large student loan as the academic fees are paid by an employer. In addition employers will pay the apprentice for any work they do for the company and provide opportunities for them to apply what they have learnt in an industrial environment. Although there is no legal requirement for the apprentice to work for the company after they have completed the apprenticeship, most employers will offer a permanent post on completion.

This programme will enable apprentices to study the BEng Honours in Automotive Engineering or the BEng Honours in Automotive Engineering with Motorsport at the University of Hertfordshire alongside developing their professional behavioural skills and knowledge to satisfy the requirements for the Product Design and Development Engineer Degree Apprenticeship Standard (with updates published on 9th April 2018).

Throughout the apprenticeship, apprentices will be employed by a company who will provide an Individual Learning Plan that includes both time to study as well as work experiences to enable them to apply the skills and knowledge gained through the degree course within the work place. The academic modules that contribute to the degree will be studied at UH alongside full-time students and other apprentices at the University in one of the following three options.

Option 1 - 4 years Full-time with Placement Year (Block Release)

This option is particularly appropriate for companies that are not within commuter distance of Hatfield, but may also be appropriate for local companies whose business can not be interrupted for apprentices to attend university on a day release or part-time basis. Whilst at UH apprentices will study on a full-time basis during semesters A and B but during semester C and during the third year the apprentice will work full-time at the company. Normal duration of the apprenticeship: 4 years.

Option 2 – 6 Years Part-time

This option is appropriate for companies local to Hatfield. The apprentice will study alongside the full time students but at half the study rate (i.e. two modules per semester). This will typically require attendance at 8 hours of classes per week during Semesters A and B usually scheduled on two half days per week. The remainder of the week the apprentice is expected to be based at the company either completing work set by UH or working for the company. Note there is a standard requirement that at least 20% of the apprentices time is “off the job training”. Whilst Option 2 typically means apprentices will do 40% “off the job training” during semesters A and B, in semester C the apprentice will work full-time for the company. Normal duration of the apprenticeship: 6 years.

Option 3 – 4 Years Part-Time (Day-release + intensive delivery courses)

NB the viability of this option will depend on the number of apprentices.

Again only suitable for companies local to Hatfield. The apprentice will study three modules per semester during Semesters A and B. Two of the modules will be delivered alongside the full time students on a one day per week release basis to attend classes. A third module will be delivered to apprentices through two intensive one week courses using blended learning methods (i.e. a combination of face-to-face and on-line learning). These intensive one week courses will typically be a few weeks apart to allow apprentices to complete assignments and independent study. There may also be some on-line preparation work to be completed before the first intensive week and a final assignment/assessment after the second intensive week. When the apprentice is not at UH they are expected to be based at the company either completing work set by UH or working for the company. This means apprentices will be doing significantly more “off the job training” during semesters A and B than apprentices doing Option 2 but during semester C the apprentice will be working full-time for the company. As such normal duration of the apprenticeship is 4 years.

In addition to the academic modules studied at UH, apprentices will complete a Professional Practice module at each level. This involves recording their work experience and developing a portfolio of evidence to present during the “end point assessment” that demonstrates all the professional behavioural skills and knowledge required by the apprenticeship standard have been achieved. The apprentice’s Industrial Mentor and Personal Tutor will monitor progress through these Professional Practice modules by meeting the apprentice on a quarterly basis and adjusting the Individual Learning Plan as appropriate.

B. Educational Aims of the Programme

The programme has been devised in accordance with the University's graduate attributes of programmes of study as set out in [UPR TL03](#). Appendix 5 gives some examples of how this programme achieves these graduate attributes.

Additionally this programme aims to:

- provide a high quality education in engineering;
- provide an education for the individual which enhances his/her prospects of professional employment in engineering and business both in national and international industries;
- provide studies which are accredited by the Institution of Mechanical Engineers;

- provide studies which develop an awareness of, and underpinning knowledge and understanding of a broad range of Mechanical Engineering areas of expertise;
- provide studies which enable the student to attain a high level of expertise in a range of topics specific to their named award.
 - Automotive Engineering students will particularly focus on vehicle design and manufacturing methods/strategies.
 - Automotive Engineering with Motorsport students will particularly study how to enhance high performance vehicles particularly through aerodynamics and engine design.

C. Intended Learning Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills and other attributes in the following areas. The programme outcomes are referenced to the QAA benchmark statements for Engineering (2015) and the Frameworks for Higher Education Qualifications of UK Degree-Awarding Bodies (2014) and relate to the typical student. Additionally, the SEEC Credit Level Descriptors for Further and Higher Education 2016 have been used as a guiding framework for curriculum design.

<u>Knowledge and Understanding</u>	<u>Teaching and learning methods</u>	<u>Assessment strategy</u>
<p>A1-The analytical methods employed by Engineers.</p> <p>A2-The fundamental engineering sciences.</p> <p>A4-The basic principles and economic, social, legal, ethical and sustainability considerations of the business of engineering.</p> <p>A5-Professional engineering practice.</p> <p>Additionally for:</p> <p>Automotive Engineering (V) A3v -The design principles and design-to-build processes appropriate to automotive vehicles.</p> <p>Automotive Engineering with Motorsport (VMS) A3vms -The design principles and design-to-build processes appropriate to automotive and motorsport vehicles.</p>	<p>Acquisition of knowledge and understanding is through the following approaches: Acquisition of A1 and A2 is through a combination of lectures, small group tutorials, coursework and laboratory work at levels 4 and 5 of the programme.</p> <p>Additional support is provided through the Mathematics Drop-in Centre. Specialist aspects of A2 are further developed at level 6.</p> <p>Acquisition of A3, A4 and A5 is through a combination of lectures, projects and coursework throughout the programme.</p> <p>Staff deploy a range of teaching and learning strategies in the most appropriate way for each individual module. This will vary depending on the subject nature of a particular module and the level of study. A more didactic approach will tend to be adopted at lower levels, in particular for A1 and A2. An increasingly self-directed and interactive approach will be adopted at higher levels, particularly for A3, A4 and A5. Throughout, the learner is encouraged to undertake independent study both to supplement and consolidate</p>	<p>Knowledge and understanding are assessed through combination of unseen examinations (A1, A2, A3 and A5) and in-course assessments (A1-A5) in the form of laboratory reports, essays and phase tests. Some aspects of A3 and A4 are assessed by design exercises and project reports and presentations. At level 6 some aspects of A5 are assessed by case study reports.</p>

	what is being taught/learnt and to broaden their individual knowledge and understanding of the subject.	
Intellectual skills	Teaching and learning methods	Assessment strategy
<p>B1- Analyse and solve engineering problems using appropriate techniques.</p> <p>B3- Select appropriate computer based methods for engineering and communication.</p> <p>B4- Evaluate external influences on the design process.</p> <p>Additionally for:</p> <p>Automotive Engineering B2v - Model and analyse automotive vehicles. B5v - Design vehicle systems, components or processes.</p> <p>Automotive Engineering with Motorsport B2vms - Model and analyse high performance vehicles. B5vms - Design high performance vehicle systems, components or processes.</p>	<p>Intellectual skills are developed throughout the programme by the methods and strategies outlined for section A of the intended learning outcomes above, again moving from a more didactic approach to an increasingly self-directed and interactive approach at higher levels, particularly for B3, B4 and B5.</p> <p>Analysis, problem solving and modelling skills (B1 and B2) are further developed through tutorial work, laboratory work, in-course exercises and project work.</p> <p>Design and IT skills (B3-B5) are further developed through project work, design exercises and some case study work at level 6.</p> <p>Feedback is given to all students on all coursework produced.</p> <p>Throughout, the learner is encouraged to develop intellectual skills further by independent study.</p>	<p>Intellectual skills B1, B2 and B5 are assessed through unseen examination papers, laboratory reports and coursework related to in-course exercises.</p> <p>Intellectual skills B3 and B4 are assessed through project reports and presentations.</p>
Practical skills	Teaching and learning methods	Assessment strategy
<p>C1- Apply analytical and modelling techniques to solve automotive engineering problems.</p> <p>C2-Perform experimental work and draw conclusions.</p> <p>C3-Use computer-based engineering tools.</p> <p>C4-Prepare technical documentation.</p> <p>C6-Plan and manage a project, taking into account economic, social, legal, ethical and sustainability constraints.</p> <p>Additionally for:</p> <p>Automotive Engineering</p>	<p>Practical skills are developed throughout the programme by the methods and strategies outlined in sections A and B of the intended learning outcomes above, again moving from a more didactic approach to an increasingly self-directed and interactive approach at higher levels, particularly for C4, C5 and C6.</p> <p>C1 is developed through laboratory work, coursework assignments and tutorial work.</p> <p>C2 is developed through laboratory work.</p> <p>C3 is developed through the use of software simulation tools at all levels.</p>	<p>Practical skills are assessed through laboratory reports, coursework assignments, design exercise submissions, case study reports, presentations, project reports and logbooks.</p>

C5v -Evaluate the design of vehicles, components or processes.

Automotive Engineering with Motorsport

C5vms -Evaluate the design of performance vehicles, components or processes.

C4 is developed through project work, lab exercises and software documentation, particularly at level 4.

C5 is developed through laboratory work at levels 5 and 6.

C6 is developed through lectures and project work.

Feedback is given to all students on all coursework produced.

Transferable skills	Teaching and learning methods	Assessment strategy
<p>D1-Communicate effectively, both orally and in writing.</p> <p>D2-Use commonly available IT tools.</p> <p>D3-Manage time and resources effectively.</p> <p>D4-Work effectively within a team as a member.</p> <p>D5-Manipulate, sort and present data.</p> <p>D6-Solve problems in a logical manner.</p> <p>D7-Learn effectively and independently, in all aspects of life.</p>	<p>Transferable skills are developed throughout the programme by the methods and strategies outlined in sections A, B and C of the intended learning outcomes above.</p> <p>D1 is developed through feedback on coursework reports, oral presentations and project reports.</p> <p>D2 is developed through their use in preparing project reports, laboratory reports, case studies, design work, etc.</p> <p>D3 is developed through project work planning and throughout the programme.</p> <p>D4 is developed through group project and assignment work.</p> <p>D5 and D6 are developed through lectures and tutorial work throughout the programme.</p> <p>D7 is developed and promoted throughout the programme.</p> <p>Throughout, the learner is encouraged to develop transferable skills by maintaining a record of evidence and completing a personal development plan.</p>	<p>Transferable skills are assessed through the following approaches:</p> <p>D1, D2, D5 and D6 are assessed through coursework, individual project and technical reports and oral presentations.</p> <p>D4 is assessed by review of group project work.</p> <p>D3 and D7 are specifically assessed by review of an individual's progress during individual project work.</p>

Appendix 2 shows how these programme learning outcomes map to the professional behavioural skills and knowledge requirements listed in the Product Design and Development Engineer Degree Apprenticeship Standard as well as the Engineering Council AHEP learning outcomes and which modules contribute to meeting the Product Design and Development Engineer Degree Apprenticeship Standard requirements.

D. Programme Structures, Features, Levels, Modules, and Credits

Entry is normally in Semester A at level 4 (with A-Level, or equivalent qualifications) but is possible at level 5 with suitable qualifications (e.g. an Edexcel HND in Engineering with appropriate subjects studied) on options 1 and 2 and option 3 from September 2019.

Professional and Statutory Regulatory Bodies

The following Bachelor's degrees are accredited as meeting the academic requirement, in part, for Chartered Engineering registration for the cohorts from 2016 intake up to, and including, 2020 intake by the Institution of Mechanical Engineers

- BEng(Hons) Automotive Engineering (Full Time - 3 years duration; Sandwich - 4 years duration; Part-Time 6 years duration)
- BEng(Hons) Automotive Engineering with Motorsport (Full Time - 3 years duration; Sandwich - 4 years duration; Part-Time 6 years duration)

Work-Based Learning

As part of a degree apprenticeship apprentices are expected to apply the skills and knowledge they have learnt in the work place. To aid this each apprentice will be allocated an Industrial Mentor by the Company and a Personal Tutor by the School. The Industrial Mentor will be responsible for developing a Schedule of Work in consultation with the Personal Tutor that provides the opportunity to develop the knowledge, skills and behaviours required by the apprenticeship standard. The Industrial Mentor and Personal Tutor will monitor progress through the Individual Learning Plan developed by the apprentice as part of the Professional Practice module at each level. In addition the apprentice shall maintain an e-portfolio of documentary evidence of achievement that is required for the end point assessment. The Industrial Mentor, Apprentice and Personal Tutor (possibly through video conferencing if necessary) shall meet on a quarterly basis to review progress and make adjustments to the Schedule of Work as appropriate. Records from these meetings shall be included in the e-portfolio.

Students are encouraged to use their experience and their reports as a basis for a presentation to the local Professional Institution Branch, Region or Division possibly through student papers or poster competitions.

End Point Assessment

As soon as possible after the completion of the BEng Honours in Automotive Engineering or the BEng Honours in Automotive Engineering with Motorsport apprentices should take the end point assessment (See the Product Design and Development Engineer Degree Apprenticeship Assessment Plan for details). The end point assessment consists of:

- A portfolio of documentary evidence that demonstrates that they have achieved the knowledge, skills and behaviours as set out in apprenticeship standard.
- A viva style interview to an Assessment Panel appointed by the Professional Engineering Institution.

Although the University is not directly involved in the end point assessment, it is expected as part of the Professional Practice module level 6 that the Industrial Mentor and Personal Tutor will support the

apprentice in preparing for the end point assessment by providing advice and running a mock interview if considered appropriate.

Programme Structure

The programme structure is shown in Appendix 1 and module details and progression information provided in Table 1a and 1b for the Honours award. Any interim awards are identified in Table 1b. The Programme Learning Outcomes detailed above are developed and assessed through the constituent modules. Table 2 identifies where each learning outcome is assessed.

Table 1a Outline Programme Structure

Mode of Study

The modes of study are: Option 1 - (Block Release) 4 years, Option 2 – (Part-Time) 6 years, Option 3 – Day release + intensive delivery courses) 4 years.

Entry point Semester A only

Level 4 Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	Compulsory (C) or Optional (O)	Semesters	Year		
								Option 1	Option 2	Option 3
Professional Practice (L4)	4ENT1144	0	English	0	100	C	ABC	1	1/2	1
Engineering Mathematics	4PAM1007	15	English	80	20	C	A	1	1	1
Automotive and Motorsport Technology	4ENT1115	15	English	-	100	C	A	1	1	1
Intro to Manufacturing Technology	4ENT1117	15	English	-	100	C	B	1	2	1*
Materials and Electrical Science	4ENT1119	15	English	-	100	C	A	1	2	2
Fluid Mechanics and Thermodynamics	4ENT1068	15	English	60	40	C	B	1	2	1
Engineering Applications of Mathematics	4PAM1033	15	English	-	100	C	B	1	1	2*
Introduction to Design	4ENT1121	15	English	-	100	C	A	1	2	1*
Mechanical Science	4ENT1067	15	English	60	40	C	B	1	1	1

* For Option 3 these modules will be delivered using two intensive one week courses.

- Progression to level 5 of BEng requires a minimum of 90 credits to remain on honours ward.
- Students who have met the above progression criteria and wish to transfer to become an apprentice may do so provided the necessary contracts have been signed before starting the level 5 studies.
- Apprentices are expected to pass the Professional Practice (L4) before progression to level 5 as an apprentice.
- Progression to non-honours level 5 with 75 credits may be permissible. The maximum study rate in such an instance would normally be 120 credits but students would be expected to remedy any failed modules from level 4 in the first instance.

Level 5 Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	Compulsory (C) or Optional (O)		Semesters	Year		
						V	VMS		Option 1	Option 2	Option 3
						Professional Practice (L5)	5ENT1106		0	English	0
Computer Aided Engineering	5ENT1078	15	English	-	100	C	C	A	2	3	2*
Dynamics	5ENT1114	15	English	70	30	C	C	A	2	4	3
Thermofluid Mechanics	5ENT1079	15	English	70	30	C	C	A	2	4	2
Further Engineering Mathematics	5PAM1005	15	English	70	30	C	C	A	2	3	3*
Auto Electronics & Control Systems	5ENT1011	15	English		100	C	C	B	2	3	3
Structural Mechanics	5ENT1012	15	English	70	30	C	C	B	2	4	2
Integrated Engineering Sys Design	5ENT1033	15	English	-	100	C	-	B	2	4	2
Motorsport Design	5ENT1041	15	English	-	100	-	C	B	2	4	2
Project Management & Product Development	5ENT1080	15	English	70	30	C	C	B	2	3	3*

* For Option 3 these modules will be delivered using two intensive one week courses.

- Progression to level 6 of BEng Honours requires 210 credit points and above at level 4 and 5.
- Students who have met the above progression criteria and wish to transfer to become an apprentice may do so provided the necessary contracts have been signed before starting the level 6 studies.
- Apprentices are expected to pass the Professional Practice (L5) before progression to level 6 as an apprentice.
- Progression to non-honours level 6 with 180 credits may be permissible. The maximum study rate in such an instance would normally be 120 credits but students would be expected to remedy any failed modules from level 5 in the first instance.

Level 6 Module Title	Module Code	Credit Points	Language of Delivery	% Examination	% Coursework	Compulsory (C) or Optional (O)		Semesters	Year		
						V	VMS		Option 1	Option 2	Option 3
Professional Practice (L6)	6ENT1118	0	English	0	100	C	C	ABC	3/4	5/6	4
BEng Individual Project (Automotive)	6ENT1094	30	English	0	100	C	C	AB	4*	6*	4*
Mechanics & Properties of Materials	6ACM0003	15	English	60	40	C	C	A	4	5	3
Vehicle Engineering Design	6AAD0022	15	English	-	100	C	C	A	4	5	4
Thermofluid Mechanics & Heat Transfer	6AAD0005	15	English	60	40	C	-	A	4	6	4
Motorsport Engineering	6ENT1053	15	English	-	100	-	C	A	4	6	4
Vibration, Noise & Vehicle Dynamics	6ENT1066	15	English	60	40	C	C	B	4	5	4
Vehicle Structural Analysis & Manu	6AAD0023	15	English	60	40	C	C	B	4	5	3
Manufacturing Strategy	6AAD0019	15	English	60	40	C		B	4	6	4
High Performance Engine Design	6ENT1054	15	English	60	40	-	C	B	4	6	4

- * Apprentices are expected to choose an industrial based project in consultation with their employer and if appropriate use facilities provided by their employer.
- Apprentices are expected to pass the Professional Practice (L6) before they take the end point assessment.
 - The award of an Honours degree requires 360 credit points passed with a minimum of at least 120 at level 6 including the BEng Individual Project (Automotive).

Honours classification

The University has approved structure and assessment regulations common to all programmes. Full details are provided in [UPR AS14](#), Section D.

Table 1b Final and interim awards available

The programme provides the following final and interim awards:

Final Award	Award Title	Minimum requirements	Available at end of Level	Programme Learning Outcomes developed (see above)
BEng (Hons)	Automotive Engineering	360 credit points including 240 at level 6/5 of which 120 must be at level 6	6	All programme learning outcomes (see Table 2)
BEng (Hons)	Automotive Engineering with Motorsport	360 credit points including 240 at level 6/5 of which 120 must be at level 6	6	All programme learning outcomes (see Table 2)

Interim Award	Award Title	Minimum requirements	Available at end of Level	Programme Learning Outcomes developed (see above)
University Certificate		45 credit points at level 4	4	See UPR AS11, section 13: http://sitem.herts.ac.uk/secreg/upr/AS11.htm
Certificate of Higher Education		120 credit points at level 4	4, 5	<i>For untitled awards:</i> See UPR AS11, section 13: http://sitem.herts.ac.uk/secreg/upr/AS11.htm
Diploma of Higher Education		240 credit points including at least 120 at level 5	5, 6	<i>For untitled awards:</i> See UPR AS11, section 13: http://sitem.herts.ac.uk/secreg/upr/AS11.htm
BEng	Automotive Engineering	300 credit points including 180 at level 6/5 of which 60 must be at level 6	6	A1, A2, A3, A4, A5, B1, B2, B3, B5, C1, C2, C3, C4, C5, C6 D1, D2, D5, D6
BEng	Automotive Engineering with Motorsport	300 credit points including 180 at level 6/5 of which 60 must be at level 6, excluding the BEng Individual Project (Automotive)	6	A1, A2, A3, A4, A5, B1, B2, B3, B5, C1, C2, C3, C4, C5, C6, D1, D2, D5, D6

Programme-specific assessment regulations

The programme complies with the University's academic regulations (in particular, [UPR AS11](#), [UPR AS12/UPR AS13](#) and [UPR AS14](#)) with the exception of those listed below, which have been approved by the University:

- A compensated pass cannot be awarded for the BEng Individual Project (Automotive);
- The BEng Individual Project (Automotive) must be included in the calculation of degree classification for Honours;

- A pass grade in the report component of the Level 6 BEng Individual Project (Automotive) is required for an award at Honours;

Course Code	Course Instance	Award Title	Modules (child instance codes & title)	Must be included in classification algorithm?
ENDAAU	VDA4S-1 VDA6P-1 V4DA4P-1	BEng (Honours) Automotive Engineering BEng Automotive Engineering	6ENT1094-0906 BEng Individual Project (Automotive)	Yes
ENDAAU	VMSSDA4S-1 VMSSDA6P-1 VMS4DA4P-1	BEng (Honours) Automotive Engineering with Motorsport BEng Automotive Engineering with Motorsport	6ENT1094-0906 BEng Individual Project (Automotive)	Yes

E. Management of Programme & Support for student learning.

Management

The programme is managed and administered through:

- Dean of School;
- Associate Dean of School (AQA) who has overall responsibility for Quality Assurance;
- Associate Dean of School (L&T) who has overall responsibility for Learning & Teaching;
- Academic Manager for Degree Apprenticeships
- Industrial Liaison Tutor and Industrial Liaison Manager
- the Programme Leader who is responsible for the day to day management of the programme, chairing the programme committee and advising students on the programme;
- the Student Administrator responsible for the administration associated with the programme;
- an Admissions Tutor, with specific responsibility for selection;
- a programme committee that includes the above plus student representation;
- module leaders who are responsible for individual modules.

Support

Students are supported by:

- An induction week at the beginning of each new academic session;
- An extensive Learning Resources Centre, incorporating a library and computer centre;
- Guided student-centred learning through the use of StudyNet;
- A student handbook that is specific to the programme;
- A Programme Leader who can advise on programme issues;
- A Programme Administrator and admin assistants in the school office;
- A Personal Tutor
- An Industrial Mentor
- Module teaching teams who provide academic support;
- Computer and technical laboratories facilities and technical support staff;
- A project supervisor;
- Student representatives on the programme committee;
- The Mathematics Drop-in Centre;

- A substantial Student Centre that provides advice on issues such as finance, University regulations, legal matters;
- The Medical Centre;
- Printing, photocopying, laminating and document binding facilities;
- Nightline – a confidential student listening and information service in the evening when other services are not available;
- A confidential counselling service;
- University Disability Advisors;
- An Equal Opportunities Officer;
- The Students' Union.

F. Other sources of information

In addition to this Programme Specification, the University publishes guidance to registered students on the programme and its constituent modules:

- A Engineering Apprenticeship Handbook;
- A Definitive Module Document (DMD) for each constituent module;
- A Module Guide for each constituent module.

The [Ask Herts](#) website provides information on a wide range of resources and services available at the University of Hertfordshire including academic support, accommodation, fees, funding, visas, wellbeing services and student societies.

As a condition of registration, all students of the University of Hertfordshire are required to comply with the University's rules, regulations and procedures. These are published in a series of documents called 'University Policies and Regulations' (UPRs). The University requires that all students consult these documents which are available on-line, on the UPR web site, at: <http://www.herts.ac.uk/secreg/upr/>. In particular, [UPR SA07](#) 'Regulations and Advice for Students' Particular Attention - Index' provides information on the UPRs that contain the academic regulations of particular relevance for undergraduate and taught postgraduate students.

In accordance with section 4(5) of the Higher Education and Research Act 2017 (HERA), the UK Office for Students (OfS) has registered the University of Hertfordshire in the register of English higher education providers. The Register can be viewed at: <https://www.officeforstudents.org.uk/advice-and-guidance/the-register/the-ofs-register/>. Furthermore, the OfS has judged that the University of Hertfordshire delivers consistently outstanding teaching, learning and outcomes for its students. It is of the highest quality found in the UK. Consequently, the University received a Gold award in the 2018 Teaching Excellence and Student Outcomes (TEF) exercise. This award was made in June 2018 and is valid for up to 3 years. The TEF panel's report and conclusions can be accessed at: <https://www.officeforstudents.org.uk/advice-and-guidance/teaching/tef-outcomes/#/provider/10007147>

G. Entry requirements

Applicants must be working in the engineering sector in a role which provides sufficient work-based learning scope to acquire the knowledge, skills and behaviour expected by the Apprenticeship Standard. They must be supported by their employer to engage in the expected off the job learning, through to End-Point Assessment and satisfy the EFSA funding rules.

Normal entry requirements at level 4 are:

- GCSE Maths, English Language and a Science at grade C or above plus;
- 104 UCAS points from 3 A-levels (or equivalent), including Mathematics plus Physics, Technology or an Engineering based subject. (General Studies/Critical Thinking are not accepted)

Applications are also welcomed from those holding other equivalent qualifications including, but not limited to:

- Engineering BTEC Extended Diploma with a Distinction in the Further Maths unit or equivalent, with Distinction, Merit, Merit overall.
- Those holding equivalent qualifications will be required to discuss their individual circumstances with the appropriate Admissions Tutor.

Applicants who do not meet these normal entry requirements may be eligible for entry to an appropriate HND or Foundation Degree elsewhere, and then subsequent admission to this programme at level 5 (see below).

Direct Entry at level 5

It is possible for apprentices to enter the programme at level 5 if they have prior certified learning. In all instances, applicants will be required to discuss their individual circumstances with the appropriate Admissions Tutor. ESFA funding rules do not allow any repeated learning and all applicants will undergo an initial needs assessment to ensure that the planned programme only includes new learning.

Apprentices applying for direct entry into level 5 are required to have an HND or Foundation Degree, or equivalent, in an appropriate discipline with merits and distinctions in appropriate subjects which must include Mathematics plus technical or physical sciences.

NB Level 5 direct entry to option 3 will not be available until September 2019.

English Language Requirements

Addition to the requirements stated above, apprentices entering the programme and whose first language is not English will be required to demonstrate a proficiency in English to TOEFL 550/IELTS 6.0 or an equivalent recognised qualification

The programme is subject to the University's Principles, Policies and Regulations for the Admission of Students to Undergraduate and Taught Postgraduate Programmes (in [UPR SA03](#)), along with associated procedures. These will take account of University policy and guidelines for assessing accredited prior certificated learning (APCL) and accredited prior experiential learning (APEL).

If you would like this information in an alternative format please contact:
the School Administration Manager

If you wish to receive a copy of the latest Programme Annual Monitoring and Evaluation Report (AMER) and/or the External Examiner's Report for the programme, please email a request to aqo@herts.ac.uk

BEng (Honours) Automotive Engineering

Table 2: Development of Intended Programme Learning Outcomes in the Constituent Modules

This map identifies where the programme learning outcomes are assessed in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the programme aims (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own learning, personal and professional development as the programme progresses

	Module Title	Module Code	Knowledge & Understanding					Intellectual Skills					Practical Skills						Transferable Skills						
			A1	A2	A3 v	A4	A5	B1	B2 v	B3	B4	B5 v	C1	C2	C3	C4	C5 v	C6	D1	D2	D3	D4	D5	D6	D7
Level 4	Professional Practice (L4)	4ENT1144																							
	Engineering Mathematics	4PAM1007																							
	Automotive and Motorsport Technology	4ENT1115																							
	Intro to Manufacturing Technology	4ENT1117																							
	Materials and Electrical Science	4ENT1119																							
	Fluid Mechanics and Thermodynamics	4ENT1068																							
	Engineering Applications of Maths	4PAM1033																							
	Introduction to Design	4ENT1121																							
Mechanical Science	4ENT1067																								
Level 5	Professional Practice (L5)	5ENT1106																							
	Computer Aided Engineering	5ENT1078																							
	Dynamics	5ENT1114																							
	Thermofluid Mechanics	5ENT1079																							
	Further Engineering Mathematics	5PAM1005																							
	Automotive Electronics and Control	5ENT1011																							
	Structural Mechanics	5ENT1012																							
	Integrated Engineering Systems Design	5ENT1033																							
Project Management & Product Dev	5ENT1080																								
Level 6	Professional Practice (L6)	6ENT1118																							
	BEng Individual Project (Automotive)	6ENT1094																							
	Mechanics & Properties of Materials	6ACM0003																							
	Vehicle Engineering Design	6AAD0022																							
	Thermofluid Mech & Heat Transfer	6AAD0005																							
	Vibration, Noise and Vehicle Dynamics	6ENT1066																							
	Vehicle Structural Analysis & Manu	6AAD0023																							
	Manufacturing Strategy	6AAD0019																							

KEY TO PROGRAMME LEARNING OUTCOMES

Automotive Engineering

Knowledge and Understanding e.g.

- A1 The analytical methods employed by engineers.
- A2 The fundamental engineering sciences.
- A3v The design principles and design-to-build processes appropriate to automotive vehicles.
- A4 The basic principles and economic, social, legal, ethical and sustainability considerations of the business of engineering.
- A5 Professional engineering practice.

Intellectual Skills e.g.

- B1 Analyse and solve engineering problems using appropriate techniques.
- B2v Model and analyse automotive vehicles.
- B3 Select appropriate computer based methods for engineering and communication.
- B4 Evaluate external influences on the design process.
- B5v Design vehicle systems, components or processes.

Practical Skills

- C1 Apply analytical and modelling techniques to solve automotive engineering problems.
- C2 Perform experimental work, and draw conclusions.
- C3 Use computer-based engineering tools.
- C4 Prepare technical documentation.
- C5v Evaluate the design of vehicles, components or processes.
- C6 Plan and manage a project, taking into account economic, social, legal, ethical and sustainability constraints.

Transferable Skills

- D1 Communicate effectively, both orally and in writing.
- D2 Use commonly available IT tools.
- D3 Manage time and resources effectively.
- D4 Work effectively within a team as a member.
- D5 Manipulate, sort and present data.
- D6 Solve problems in a logical manner.
- D7 Learn effectively and independently, in all aspects of life.

BEng (Honours) Automotive Engineering with Motorsport

Table 2: Development of Intended Programme Learning Outcomes in the Constituent Modules

This map identifies where the programme learning outcomes are assessed in the constituent modules. It provides (i) an aid to academic staff in understanding how individual modules contribute to the programme aims (ii) a checklist for quality control purposes and (iii) a means to help students monitor their own learning, personal and professional development as the programme progresses

	Module Title	Module Code	Knowledge & Understanding					Intellectual Skills					Practical Skills						Transferable Skills						
			A1	A2	A3 vms	A4	A5	B1	B2 vms	B3	B4	B5 vms	C1	C2	C3	C4	C5 vms	C6	D1	D2	D3	D4	D5	D6	D7
Level 4	Professional Practice (L4)	4ENT1144																							
	Engineering Mathematics	4PAM1007																							
	Automotive and Motorsport Technology	4ENT1115																							
	Intro to Manufacturing Technology	4ENT1117																							
	Materials and Electrical Science	4ENT1119																							
	Fluid Mechanics and Thermodynamics	4ENT1068																							
	Engineering Applications of Maths	4PAM1033																							
	Introduction to Design	4ENT1121																							
Mechanical Science	4ENT1067																								
Level 5	Professional Practice (L5)	5ENT1106																							
	Computer Aided Engineering	5ENT1078																							
	Dynamics	5ENT1114																							
	Thermofluid Mechanics	5ENT1079																							
	Further Engineering Mathematics	5PAM1005																							
	Automotive Electronics and Control	5ENT1011																							
	Structural Mechanics	5ENT1012																							
	Motorsport Design	5ENT1041																							
Project Management & Product Dev	5ENT1080																								
Level 6	Professional Practice (L6)	6ENT1118																							
	BEng Individual Project (Automotive)	6ENT1094																							
	Mechanics & Properties of Materials	6ACM0003																							
	Vehicle Engineering Design	6AAD0022																							
	High Performance Engine Design	6ENT1054																							
	Vibration, Noise and Vehicle Dynamics	6ENT1066																							
	Vehicle Structural Analysis & Manu	6AAD0023																							
	Motorsport Engineering	6ENT1053																							

KEY TO PROGRAMME LEARNING OUTCOMES

Automotive Engineering

Knowledge and Understanding e.g.

- A1 The analytical methods employed by engineers.
- A2 The fundamental engineering sciences.
- A3vms The design principles and design-to-build processes appropriate to automotive and motorsport vehicles.
- A4 The basic principles and economic, social, legal, ethical and sustainability considerations of the business of engineering.
- A5 Professional engineering practice.

Intellectual Skills e.g.

- B1 Analyse and solve engineering problems using appropriate techniques.
- B2vms Model and analyse high performance vehicles.
- B3 Select appropriate computer based methods for engineering and communication.
- B4 Evaluate external influences on the design process.
- B5vms Design high performance vehicle systems, components or processes.

Practical Skills

- C1 Apply analytical and modelling techniques to solve automotive engineering problems.
- C2 Perform experimental work, and draw conclusions.
- C3 Use computer-based engineering tools.
- C4 Prepare technical documentation.
- C5vms Evaluate the design of performance vehicles, components or processes.
- C6 Plan and manage a project, taking into account economic, social, legal, ethical and sustainability constraints.

Transferable Skills

- D1 Communicate effectively, both orally and in writing.
- D2 Use commonly available IT tools.
- D3 Manage time and resources effectively.
- D4 Work effectively within a team as a member.
- D5 Manipulate, sort and present data.
- D6 Solve problems in a logical manner.
- D7 Learn effectively and independently, in all aspects of life.

Appendix 1 - Programme Structure for the Engineering Degree Apprenticeship (Automotive) BEng (Honours) Automotive Engineering

		Option 1 - Block Release Mode				Option 2 - Part-Time Mode					Option 3 - Day Release + Short Course Mode				
Year	Level	Semester A		Level	Semester B		C	Level	Semester A		Level	Semester B		C	
1	4	Engineering Mathematics		4	Engineering Applications of Mathematics		Industrial Experience	4	Engineering Mathematics		4	Engineering Applications of Mathematics		Industrial Experience	
	4	Automotive and Motorsport Technology		4	Mechanical Science			4	Automotive and Motorsport Technology		4	Mechanical Science			
	4	Introduction to Design		4	Intro to Manufacturing Technology			4	Introduction to Design		4	Intro to Manufacturing Technology			
	4	Materials and Electrical Science		4	Fluid Mechanics & Thermodynamics			4	Industrial Experience		4	Industrial Experience			
2	5	Thermofluid Mechanics		5	Structural Mechanics		Industrial Experience	4	Materials and Electrical Science		4	Fluid Mechanics & Thermodynamics		Industrial Experience	
	5	Computer Aided Engineering		5	Project Management & Product Development			4	Introduction to Design		4	Intro to Manufacturing Technology			
	5	Further Engineering Mathematics		5	Integrated Engineering Systems Design			5	Computer Aided Engineering		5	Integrated Engineering Systems Design			
	5	Dynamics		5	Automotive Electronics & Control Systems			5	Industrial Experience		5	Industrial Experience			
3		Industrial Experience			Industrial Experience		Industrial Experience	5	Further Engineering Mathematics		5	Project Management & Product Development		Industrial Experience	
		Industrial Experience			Industrial Experience			5	Computer Aided Engineering		5	Automotive Electronics & Control Systems			
		Industrial Experience			Industrial Experience			6	Mechanics & Properties of Materials		6	Vibration, Noise & Vehicle Dynamics			
		Industrial Experience			Industrial Experience			6	Industrial Experience		6	Industrial Experience			
4	6	Mechanics & Properties of Materials		6	Vibration, Noise & Vehicle Dynamics		Industrial Experience	5	Thermofluid Mechanics		5	Structural Mechanics		Industrial Experience	
	6	Vehicle Engineering Design		6	Vehicle Structural Analysis & Manu			5	Dynamics		5	Integrated Engineering Systems Design			
	6	Thermofluid Mechanics & Heat Transfer		6	Manufacturing Strategy			6	Industrial Experience		6	Industrial Experience			
	6	BEng Individual Project (Automotive) (30 credits)						6	Industrial Experience		6	BEng Individual Project (Automotive) (30 credits)			
5							Industrial Experience	6	Mechanics & Properties of Materials		6	Vibration, Noise & Vehicle Dynamics		Industrial Experience	
								6	Vehicle Engineering Design		6	Vehicle Structural Analysis & Manu			
									Industrial Experience			Industrial Experience			
									Industrial Experience			Industrial Experience			
6							Industrial Experience	6	Thermofluid Mechanics & Heat Transfer		6	Manufacturing Strategy		Industrial Experience	
								6	BEng Individual Project (Automotive) (30 credits)						
									Industrial Experience			Industrial Experience			
									Industrial Experience			Industrial Experience			

NB Yellow highlighted modules are delivered through two intensive one week courses.

BEng (Honours) Automotive Engineering with Motorsport

		Option 1 - Block Release Mode				Option 2 - Part-Time Mode				Option 3 - Day Release + Short Course Mode					
Year	Level	Semester A	Level	Semester B	C	Level	Semester A	Level	Semester B	C	Level	Semester A	Level	Semester B	C
1	4	Engineering Mathematics	4	Engineering Applications of Mathematics	Industrial Experience	4	Engineering Mathematics	4	Engineering Applications of Mathematics	Industrial Experience	4	Engineering Mathematics	4	Mechanical Science	Industrial Experience
	4	Automotive and Motorsport Technology	4	Mechanical Science		4	Automotive and Motorsport Technology	4	Mechanical Science		4	Automotive and Motorsport Technology	4	Fluid Mechanics & Thermodynamics	
	4	Introduction to Design	4	Intro to Manufacturing Technology		4	Industrial Experience	4	Industrial Experience		4	Introduction to Design	4	Intro to Manufacturing Technology	
	4	Materials and Electrical Science	4	Fluid Mechanics & Thermodynamics		4	Industrial Experience	4	Industrial Experience		4	Industrial Experience	4	Industrial Experience	
2	5	Thermofluid Mechanics	5	Structural Mechanics	Industrial Experience	4	Materials and Electrical Science	4	Fluid Mechanics & Thermodynamics	Industrial Experience	4	Materials and Electrical Science	4	Engineering Applications of Mathematics	Industrial Experience
	5	Computer Aided Engineering	5	Project Management & Product Development		4	Introduction to Design	4	Intro to Manufacturing Technology		5	Thermofluid Mechanics	5	Structural Mechanics	
	5	Further Engineering Mathematics	5	Motorsport Design		5	Industrial Experience	5	Industrial Experience		5	Computer Aided Engineering	5	Motorsport Design	
	5	Dynamics	5	Automotive Electronics & Control Systems		5	Industrial Experience	5	Industrial Experience		5	Industrial Experience	5	Industrial Experience	
3		Industrial Experience		Industrial Experience	Industrial Experience	5	Further Engineering Mathematics	5	Project Management & Product Development	Industrial Experience	5	Further Engineering Mathematics	5	Project Management & Product Development	Industrial Experience
		Industrial Experience		Industrial Experience		5	Computer Aided Engineering	5	Automotive Electronics & Control Systems		5	Dynamics	5	Automotive Electronics & Control Systems	
		Industrial Experience		Industrial Experience		6	Industrial Experience	6	Industrial Experience		6	Mechanics & Properties of Materials	6	Vibration, Noise & Vehicle Dynamics	
		Industrial Experience		Industrial Experience		6	Industrial Experience	6	Industrial Experience		6	Industrial Experience	6	Industrial Experience	
4	6	Mechanics & Properties of Materials	6	Vibration, Noise & Vehicle Dynamics	Industrial Experience	5	Thermofluid Mechanics	5	Structural Mechanics	Industrial Experience	6	Vehicle Engineering Design	6	Vehicle Structural Analysis & Manu	Industrial Experience
	6	Vehicle Engineering Design	6	Vehicle Structural Analysis & Manu		5	Dynamics	5	Motorsport Design		6	Motorsport Engineering	6	High Performance Engine Design	
	6	Motorsport Engineering	6	High Performance Engine Design		6	Industrial Experience	6	Industrial Experience		6	BEng Individual Project (Automotive) (30 credits)			
	6	BEng Individual Project (Automotive) (30 credits)				6	Industrial Experience	6	Industrial Experience		6	Industrial Experience	6	Industrial Experience	
5					Industrial Experience	6	Mechanics & Properties of Materials	6	Vibration, Noise & Vehicle Dynamics	Industrial Experience					Industrial Experience
						6	Vehicle Engineering Design	6	Vehicle Structural Analysis & Manu						
						6	Industrial Experience	6	Industrial Experience						
						6	Industrial Experience	6	Industrial Experience						
6					Industrial Experience	6	Motorsport Engineering	6	High Performance Engine Design	Industrial Experience					Industrial Experience
						6	BEng Individual Project (Automotive) (30 credits)								
						6	Industrial Experience	6	Industrial Experience						
						6	Industrial Experience	6	Industrial Experience						

NB Yellow highlighted modules are delivered through two intensive one week courses.

Appendix 2 - Learning Outcomes Mapping of Degree Apprenticeship Standards to the BEng in Automotive Engineering (V) and Automotive Engineering with Motorsport (VMS)

Degree Apprenticeship Standard Requirements	AHEP3 IEng LOs (Appendix 3)	AHEP3 CEng(partial) LOs (Appendix 4)	UH Programme LOs	Modules that contribute to the assessment of the requirement
Knowledge:				
K1 Mathematics and science for engineers	SM1i, SM2i	SM1p, SM2p	A1,A2	4PAM1007 Engineering Mathematics 4PAM1033 Engineering Applications of Mathematics 5PAM1005 Further Engineering Mathematics 4ENT1119 Materials and Electrical Science 4ENT1067 Mechanical Science 4ENT1068 Fluid Mechanics and Thermodynamics 5ENT1114 Dynamics 5ENT1040 Thermofluid Mechanics 5ENT1012 Structural Mechanics 6ACM0003 Mechanics and Properties of Materials 6ENT1066 Vibration, Noise and Vehicle Dynamics 6AAD0023 Vehicle Structural Analysis and Manufacture
K2 Materials and manufacture	SM1i, EP2i, EP3i	SM1p, EP2p, EP3p	A2	4ENT1119 Materials and Electrical Science 4ENT1117 Introduction to Manufacturing Technology 6ACM0003 Mechanics and Properties of Materials 6AAD0023 Vehicle Structural Analysis and Manufacture
K3 Mechanical, electrical and electronic principles and applications	SM1i, EP1i	SM1p, EP1p	A2	4ENT1067 Mechanical Science 4ENT1119 Materials and Electrical Science 5ENT1011 Automotive Electronics and Control 5ENT1114 Dynamics 5ENT1040 Thermofluid Mechanics 5ENT1012 Structural Mechanics 6AAD0005 Thermofluid Mechanics & Heat Transfer (V) 6ENT1054 High Performance Engine Design (VMS)
K4 Statics and dynamics	SM1i, EP1i	SM1p, EP1p	A2	4ENT1067 Mechanical Science 5ENT1114 Dynamics 5ENT1012 Structural Mechanics 6ENT1066 Vibration, Noise and Vehicle Dynamics 6AAD0023 Vehicle Structural Analysis and Manufacture
K5 How to undertake and apply business-led projects	D1i, D2i, D5i, ET1i, ET2i,	D1p, D2p, D5p, ET1p, ET2p, ET3p,	A4, C6	5ENT1080 Project Management and product Development 6ENT1094 BEng Individual Project (Automotive)

	ET3i, ET4i, ET5i, ET6i	ET4p, ET5p, ET6p		
K6 Engineering operations and business management	D1i, D2i, D5i, D6i, ET1i, ET2i, ET3i, ET4i, ET5i, ET6i, EP1i, EP2i, EP3i, EP5i	D1p, D2p, D5p, D6p, ET1p, ET2p, ET3p, ET4p, ET5p, ET6p, EP1p, EP2p, EP3p, EP5p	A4, C6	5ENT1080 Project Management and product Development 6AAD0019 Manufacturing Strategy (V)
K7 Applying advanced technology techniques	EA2i, EA3i, EA4i, D4i, ET3i, EP1i, EP2i, EP3i, EP4i, EP5i, EP6i	EA2p, EA3p, EA4p, D4p, ET3p, EP1p, EP2p, EP3p, EP4p, EP5p, EP6p	A3, B3, C2, C3, C5	4ENT1117 Introduction to Manufacturing Technology 4ENT1121 Introduction to Design 4ENT1115 Automotive and Motorsport Technology 5ENT1078 Computer Aided Engineering 5ENT1033 Integrated Engineering Systems Design (V) 5ENT1041 Motorsport Design (VMS) 6AAD0022 Vehicle Engineering Design 6ENT1054 High Performance Engine Design (VMS)
Skills:				
S1 Comply with statutory and organisational safety requirements and demonstrate a responsible and disciplined approach to risk mitigation, avoidance and management	D1i, D2i, ET1i, ET2i, ET5i, EP3i, EP4i, EP5i	D1p, D2p, ET1p, ET2p, ET5p, EP3p, EP4p, EP5p	A4, A5	4ENT1117 Introduction to Manufacturing Technology 4ENT1115 Automotive and Motorsport Technology 5ENT1080 Project Management and product Development 5ENT1033 Integrated Engineering Systems Design (V) 5ENT1041 Motorsport Design (VMS) 6AAD0022 Vehicle Engineering Design
S2 Effectively use, interpret and evaluate a range of engineering data sources and documentation	EA1i, EA2i, EA3i, D1i, D2i, D3i, D5i, EP4i	EA1p, EA2p, EA3p, D1p, D2p, D3p, D5p, EP4p	B4, D5	4ENT1117 Introduction to Manufacturing Technology 4ENT1119 Materials and Electrical Science 4ENT1068 Fluid Mechanics and Thermodynamics 4PAM1033 Engineering Applications of Mathematics 5PAM1005 Further Engineering Mathematics 5ENT1040 Thermofluid Mechanics 5ENT1078 Computer Aided Engineering 5ENT1033 Integrated Engineering Systems Design (V) 5ENT1041 Motorsport Design (VMS) 6AAD0022 Vehicle Engineering Design
S3 Organise work efficiently and effectively by managing engineering resources when completing tasks	D2i, D4i, D5i, ET1i, ET3i, EP2i, EP3i, EP4i, EP5i, EP6i, EP7i	D2p, D4p, D5p, ET1p, ET3p, EP2p, EP3p, EP4p, EP5p, EP6p, EP7p, EP8p	D3	4ENT1121 Introduction to Design 5ENT1080 Project Management and product Development 5ENT1033 Integrated Engineering Systems Design (V) 5ENT1041 Motorsport Design (VMS) 6ENT1094 BEng Individual Project (Automotive) 6AAD0022 Vehicle Engineering Design

				6AAD0019 Manufacturing Strategy (V)
S4 Use computer software packages to assist with engineering activities	EA1i, EA3i, EA4i, D4i, D5i, D6i, EP2i, EP3i	EA1p, EA3p, EA4p, D4p, D5p, D6p, EP2p, EP3p	C3	4ENT1121 Introduction to Design 5ENT1078 Computer Aided Engineering 5ENT1033 Integrated Engineering Systems Design (V) 5ENT1041 Motorsport Design (VMS) 6AAD0022 Vehicle Engineering Design 6ACM0003 Mechanics and Properties of Materials 6AAD0023 Vehicle Structural Analysis and Manufacture 6ENT1094 BEng Individual Project (Automotive)
S5 Carry out Project Management activities	ET1i, ET3i, EP1i, EP7i	ET1p, ET3p, EP1p, EP7p	C6, D3	5ENT1080 Project Management and product Development 6ENT1094 BEng Individual Project (Automotive)
S6 Establish design briefs, presenting and discussing technical proposals	D1i, D2i, D5i, D6i, ET2i, ET4i, ET5i, ET6i	D1p, D2p, D5p, D6p, ET2p, ET4p, ET5p, ET6p	B5, C4	4ENT1121 Introduction to Design 5ENT1080 Project Management and product Development 5ENT1033 Integrated Engineering Systems Design (V) 5ENT1041 Motorsport Design (VMS) 6AAD0022 Vehicle Engineering Design
S7 Manage and control product design changes	D1i, D2i, D3i, D4i, D5i, D6i, ET1i, ET2i, ET3i, ET4i, ET5i, ET6i	D1p, D2p, D3p, D4p, D5p, D6p, ET1p, ET2p, ET3p, ET4p, ET5p, ET6p	C5	5ENT1080 Project Management and product Development 5ENT1033 Integrated Engineering Systems Design (V) 5ENT1041 Motorsport Design (VMS) 6AAD0022 Vehicle Engineering Design 6AAD0019 Manufacturing Strategy (V)
S8 Support team feasibility design reviews	D6i, EP7i	D6p, EP9p	D4	4ENT1121 Introduction to Design 5ENT1033 Integrated Engineering Systems Design (V) 5ENT1041 Motorsport Design (VMS) 6AAD0022 Vehicle Engineering Design
S9 Demonstrate technical and commercial management by planning and managing tasks & resources	D1i, D2i, D3i, D5i, D6i, ET1i, ET2i, ET3i, ET5i, ET6i, EP1i, EP6i, EP7i	D1p, D2p, D3p, D5p, D6p, ET1p, ET2p, ET3p, ET5p, ET6p, EP1p, EP6p, EP7p, EP8p, EP9p	D3	5ENT1080 Project Management and product Development 5ENT1033 Integrated Engineering Systems Design (V) 6AAD0019 Manufacturing Strategy (V) 6ENT1094 BEng Individual Project (Automotive)
Behaviour:				
<i>B1 Safety mindset. The importance of complying with statutory and organisational health, safety and risk management requirements and the implications if these are not adhered to</i>	ET1i, ET5i, EP2i, EP3i, EP5i	ET1p, ET5p, EP2p, EP3p, EP5p	A5, B4, C2 + Graduate Attributes (see Appendix 5)	4ENT1117 Introduction to Manufacturing Technology 5ENT1080 Project Management and product Development 6AAD0022 Vehicle Engineering Design 6ENT1094 BEng Individual Project (Automotive) Professional Practice (L4), (L5), (L6)

<i>B2 Strong work ethic: Has a positive attitude, motivated by engineering; dependable, ethical, responsible and reliable</i>	ET1i, AGS2, AGS4	ET1p, AGS2, AGS4	D4 + See Graduate Attributes (See Appendix 5)	5ENT1080 Project Management and product Development 6AAD0022 Vehicle Engineering Design 6ENT1094 BEng Individual Project (Automotive) Professional Practice (L4), (L5), (L6)
<i>B3 Logical approach: Able to structure a plan and develop activities following a logical thought process, but also able to quickly “think on feet” when working through them</i>	D2i, EP1i, EP3i, AGS3	D2p, EP1p, EP3p, AGS3	D6 + See Graduate Attributes (See Appendix 5)	5ENT1080 Project Management and product Development 5ENT1033 Integrated Engineering Systems Design (V) 6AAD0022 Vehicle Engineering Design 6ENT1094 BEng Individual Project (Automotive) Professional Practice (L4), (L5), (L6)
<i>B4 Problem solving orientation: Identifies issues quickly, enjoys solving complex problems and applies appropriate solutions. Has a strong desire to push to ensure the true root cause of any problem is found and a solution identified which prevents further recurrence.</i>	EA3i, EA4i, D2i, D4i, AGS1	EA3p, EA4p, D2p, D4p, AGS1	B1, D6 + See Graduate Attributes (See Appendix 5)	5ENT1080 Project Management and product Development 5ENT1033 Integrated Engineering Systems Design (V) 6AAD0022 Vehicle Engineering Design Professional Practice (L4), (L5), (L6)
<i>B5 Quality focus: Follows rules, procedures and principles in ensuring work completed is fit for purpose and pays attention to detail / error checks throughout activities.</i>	ET1i, EP3i, EP4i, EP5i, EP6i, AGS2, AGS3,	ET1p, EP3p, EP4p, EP5p, EP6p, AGS2, AGS3,	A4, B4, + See Graduate Attributes (See Appendix 5)	6AAD0022 Vehicle Engineering Design 6AAD0019 Manufacturing Strategy (V) 6ENT1094 BEng Individual Project (Automotive) Professional Practice (L4), (L5), (L6)
<i>B6 Personal responsibility and resilience: Motivated to succeed accountable and persistent to complete task.</i>	EP7i, AGS1, AGS2, AGS3, AGS4	EP9p, AGS1, AGS2, AGS3, AGS4	D7 + See Graduate Attributes (See Appendix 5)	6AAD0022 Vehicle Engineering Design 6ENT1094 BEng Individual Project (Automotive) Professional Practice (L4), (L5), (L6)
<i>B7 Clear communicator: Uses a variety of appropriate communication methods to give/receive information accurately, and in a timely and positive manner.</i>	D6i, AGS1,	D6p, AGS1,	D1 + See Graduate Attributes (See Appendix 5)	6AAD0022 Vehicle Engineering Design 6ENT1094 BEng Individual Project (Automotive) Professional Practice (L4), (L5), (L6)
<i>B8 Team player: Not only plays own part but able to work and communicate clearly and effectively within a team and interacts/ helps others when required. In doing so applies these skills in a respectful professional manner.</i>	EP7i, AGS4	EP9p, AGS4	D4 + See Graduate Attributes (See Appendix 5)	4ENT1121 Introduction to Design 5ENT1033 Integrated Engineering Systems Design (V) 5ENT1041 Motorsport Design (VMS) 6AAD0022 Vehicle Engineering Design (V/VMS) Professional Practice (L4), (L5), (L6)

<i>B9 Applies Lean Manufacturing Principles: Demonstrates continuous improvement in driving effectiveness and efficiency</i>	EP1i, EP2i, EP6i	EP1p, EP2p, EP7p	A3, B4	5ENT1080 Project Management and product Development 5ENT1033 Integrated Engineering Systems Design (V) 6AAD0019 Manufacturing Strategy (V) Professional Practice (L4), (L5), (L6)
<i>B10 Adaptability: Able to adjust to different conditions, technologies, situations and environments.</i>	AGS2, AGS3, AGS4	AGS2, AGS3, AGS4	D7 + See Graduate Attributes (See Appendix 5)	6ENT1094 BEng Individual Project (Automotive) Professional Practice (L4), (L5), (L6)
<i>B11 Self-Motivation: A 'self-starter', who always wants to give their best, sets themselves challenging targets, can make their own decisions.</i>	AGS2, AGS3, AGS4	AGS2, AGS3, AGS4	D7 + See Graduate Attributes (See Appendix 5)	6ENT1094 BEng Individual Project (Automotive) Professional Practice (L4), (L5), (L6)
<i>B12 Willingness to learn: Wants to drive their continuous professional development</i>	AGS2, AGS3, AGS4	AGS2, AGS3, AGS4	D7 + See Graduate Attributes (See Appendix 5)	6ENT1094 BEng Individual Project (Automotive) Professional Practice (L4), (L5), (L6)
<i>B13 Commitment: Able to commit to the beliefs, goals and standards of their own employer and to the wider industry and its professional standards.</i>	AGS2, AGS3, AGS4	AGS2, AGS3, AGS4	D7 + See Graduate Attributes (See Appendix 5)	Professional Practice (L4), (L5), (L6)

Appendix 3 - Engineering Council – UK-SPEC Learning Outcome Codes for IEng accreditation

AHEP code	Learning Outcome
Science and Mathematics	
SM1i	Knowledge and understanding of the scientific principles underpinning relevant current technologies, and their evolution
SM2i	Knowledge and understanding of mathematics and an awareness of statistical methods necessary to support application of key engineering principles
Engineering Analysis	
EA1i	Ability to monitor, interpret and apply the results of analysis and modelling in order to bring about continuous improvement.
EA2i	Ability to apply quantitative methods in order to understand the performance of systems and components.
EA3i	Ability to use the results of engineering analysis to solve engineering problems and to recommend appropriate action.
EA4i	Ability to apply an integrated or systems approach to engineering problems through know-how of the relevant technologies and their application.
Design	
D1i	Be aware of business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics.
D2i	Define the problem, identifying any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards
D3i	Work with information that may be incomplete or uncertain and be aware that this may affect the design
D4i	Apply problem-solving skills, technical knowledge and understanding to create or adapt design solutions that are fit for purpose including operation, maintenance, reliability etc
D5i	Manage the design process, including cost drivers, and evaluate outcomes
D6i	Communicate their work to technical and non-technical audiences.
Economic, legal, social, ethical and environmental context	
ET1i	Understanding of the need for a high level of professional and ethical conduct in engineering and a knowledge of professional codes of conduct
ET2i	Knowledge and understanding of the commercial, economic and social context of engineering processes
ET3i	Knowledge of management techniques that may be used to achieve engineering objectives
ET4i	Understanding of the requirement for engineering activities to promote sustainable development
ET5i	Awareness of relevant legal requirements governing engineering activities, including personnel, health & safety, contracts, intellectual property rights, product safety and liability issues
ET6i	Awareness of risk issues, including health & safety, environmental and commercial risk.
Engineering Practice	
EP1i	Knowledge of contexts in which engineering knowledge can be applied (eg operations and management, application and development of technology, etc)
EP2i	Understanding of and ability to use relevant materials, equipment, tools, processes, or products
EP3i	Knowledge and understanding of workshop and laboratory practice
EP4i	Ability to use and apply information from technical literature
EP5i	Ability to use appropriate codes of practice and industry standards
EP6i	Awareness of quality issues and their application to continuous improvement
EP7i	Awareness of team roles and the ability to work as a member of an engineering team.
Additional General Skills	
AGS1	Apply their skills in problem solving, communication, working with others, information retrieval and the effective use of general IT facilities
AGS2	Plan self-learning and improve performance, as the foundation for lifelong learning/CPD
AGS3	Monitor and adjust a personal programme of work on an on-going basis
AGS4	Exercise initiative and personal responsibility, which may be as a team member or leader

Appendix 4 - Engineering Council – UK-SPEC Learning Outcome Codes for CEng (partial) accreditation

AHEP code	Learning Outcome
Science and Mathematics	
SM1p	Knowledge and understanding of scientific principles and methodology necessary to underpin their education in their engineering discipline, to enable appreciation of its scientific and engineering context, and to support their understanding of relevant historical, current and future developments and technologies.
SM2p	Knowledge and understanding of mathematical and statistical methods necessary to underpin their education in their engineering discipline and to enable them to apply mathematical and statistical methods, tools and notations proficiently in the analysis and solution of engineering problems.
SM3p	Ability to apply and integrate knowledge and understanding of other engineering disciplines to support study of their own engineering discipline.
Engineering Analysis	
EA1p	Understanding of engineering principles and the ability to apply them to analyse key engineering processes.
EA2p	Ability to identify, classify and describe the performance of systems and components through the use of analytical methods and modelling techniques.
EA3p	Ability to apply quantitative and computational methods in order to solve engineering problems and to implement appropriate action.
EA4p	Understanding of, and the ability to apply, an integrated or systems approach to solving engineering problems.
Design	
D1p	Understand and evaluate business, customer and user needs, including considerations such as the wider engineering context, public perception and aesthetics.
D2p	Investigate and define the problem, identifying any constraints including environmental and sustainability limitations; ethical, health, safety, security and risk issues; intellectual property; codes of practice and standards.
D3p	Work with information that may be incomplete or uncertain and quantify the effect of this on the design.
D4p	Apply advanced problem-solving skills, technical knowledge and understanding, to establish rigorous and creative solutions that are fit for purpose for all aspects of the problem including production, operation, maintenance and disposal.
D5p	Plan and manage the design process, including cost drivers, and evaluate outcomes.
D6p	Communicate their work to technical and non-technical audiences.
Economic, legal, social, ethical and environmental context	
ET1p	Understanding of the need for a high level of professional and ethical conduct in engineering and a knowledge of professional codes of conduct
ET2p	Knowledge and understanding of the commercial, economic and social context of engineering processes
ET3p	Knowledge and understanding of management techniques, including project management, that may be used to achieve engineering objectives
ET4p	Understanding of the requirement for engineering activities to promote sustainable development and ability to apply quantitative techniques where appropriate
ET5p	Awareness of relevant legal requirements governing engineering activities, including personnel, health & safety, contracts, intellectual property rights, product safety and liability issues
ET6p	Knowledge and understanding of risk issues, including health & safety, environmental and commercial risk, and of risk assessment and risk management techniques
Engineering Practice	
EP1p	Understanding of contexts in which engineering knowledge can be applied (eg operations and management, application and development of technology, etc)
EP2p	Knowledge of characteristics of particular materials, equipment, processes, or products
EP3p	Ability to apply relevant practical and laboratory skills
EP4p	Understanding of the use of technical literature and other information sources
EP5p	Knowledge of relevant legal and contractual issues
EP6p	Understanding of appropriate codes of practice and industry standards
EP7p	Awareness of quality issues and their application to continuous improvement
EP8p	Ability to work with technical uncertainty
EP9p	Understanding of, and the ability to work in, different roles within an engineering team.
Additional General Skills	
AGS1	Apply their skills in problem solving, communication, working with others, information retrieval and the effective use of general IT facilities
AGS2	Plan self-learning and improve performance, as the foundation for lifelong learning/CPD
AGS3	Monitor and adjust a personal programme of work on an on-going basis
AGS4	Exercise initiative and personal responsibility, which may be as a team member or leader

Appendix 5 - UH Graduate Attributes

This programme embodies the University of Hertfordshire graduate attributes extensively – indeed these attributes align very well with the requirements of UK-SPEC which these programmes fulfil in order to be accredited. The following paragraphs indicate how this is achieved.

Professionalism, employability and enterprise

Being vocational programmes apprentices will have many opportunities to develop communication skills, work independently and in teams both in industry and at UH, building confidence at problem solving and developing creativity and self-management skills in the context of their specific engineering industry. Team work is fostered through design based modules at each level and particularly through a group design task at level 6 on 6AAD0022 Vehicle Engineering Design. Students and apprentices have contact with practicing engineers throughout their degree course through guest lectures, however apprentices will additionally benefit from being fully immersed in a professional environment whenever they are working at their companies. Like the sandwich students, apprentices will be encouraged to gain an EngTech through registration with the IMechE.

Learning and research skills

The apprenticeship programme provides opportunities to develop effective learning skills. As part of the induction process apprentices will be introduced to the learning and research resources available within the University and on line through UH's Virtual Learning Environment, Studynet. In subsequent years, these skills are enhanced and supported by Helen Singer, the Schools Information Manager. These skills are assessed through a number of modules and particularly in 6ENT1094 BEng Individual Project (Automotive).

Intellectual depth, breadth and adaptability

The University encourages engagement in curricular, co-curricular and extra-curricular activities that deepen and broaden knowledge and develop powers of analysis, application, synthesis, evaluation and criticality. This occurs throughout the curriculum as the students/apprentices are exposed to Engineering Mathematics and Science, including technically deepening specialist topics appropriate to their discipline, providing a theoretical underpinning, practical work in laboratories and the workshop which are then brought together in Design modules and various forms of project work – again including Individual and Group Project work. Apprentices will be encouraged to adapt the technical skills they have learnt at UH in the work place. This will be assessed as part of the Professional Practice modules and as part of the end point assessment.

Respect for others

The School of Engineering and Computer Science attract students from diverse backgrounds both geographically and culturally and strive to promote self-awareness, empathy, cultural awareness and mutual respect, all key ingredients for successful team working. Apprentices will be studying, and at times working, alongside these students in group activities in a number of modules and particularly through a Group Design task at level 6 on 6AAD0022. In addition they will gain further experience of working a multidisciplinary teams within their companies. This will be assessed as part of the Professional Practice modules and as part of the end point assessment.

Social responsibility

The School, primarily through the use of project work, steers their graduates towards an understanding that the actions they take really can make a positive contribution to society. As Engineers and Technologists, students and apprentices are taught the importance of environmental, economical, ethical, regulatory and consumer requirements when designing new products. This is formally covered in Project Management & Product Development but expected to be applied during several modules and particularly during the group design project as part of 6AAD0022.

Section 2

Programme management

Relevant QAA subject benchmarking statements	Engineering
Type of programme	Undergraduate – Apprenticeship Degree
Date of validation/last periodic review	March 18
Date of production/ last revision of PS	April 2019
Relevant to level/cohort	Level 4 entering September 2019
Administrative School	School of Engineering and Technology

Table 3 Course structure

Course details		
Course code	Course description	JACS
ENDAAU	BEng (Hons) Automotive Engineering (Degree Apprenticeship)	H330
Course Instances		
Option 1: 4 years Full-time with Placement Year (Block Release)		
Option 2: 6 Years Part-Time		
Option 3: 4 Years Part-Time (Day release + intensive delivery courses)		