Course Handbook

BEng (Hons) Motor Sports Engineering
MEng (Hons) Motor Sports Engineering
2020-21

Graham Calderbank
School of Engineering

Please read this Handbook in conjunction with the University's Student Handbook.

Contents

1. Welcome to the course

Welcome to UCLAN Motor Sports. We hope to provide you with an engaging and challenging education, and to develop competences appropriate to Motor Sports Engineering that will serve you well throughout your career.

Please read the handbook carefully as it is a source of information on the academic, administrative and operational aspects of your course and it is intended to explain what is required of you, and what you should expect from us. Please feel free to discuss any aspects with any member of the course team.

1.1 Rationale, aims and learning outcomes of the course

The course is intended to provide the opportunity to gain a degree and additional valuable experience to enable graduates to have a good chance of entering the motor sports industry. It has been developed as a direct result of the need for professionals within the motor sports industry and satisfies the requirements of an Engineering Council Institution.

The course is three years (BEng) or four years (MEng) in duration, plus an extra year if an industrial placement is included. Satisfactory completion of an industrial placement leads to the award: BEng/MEng (Honours) Motor Sports Engineering with Industrial Placement.

The aims of the BEng Motor Sports Engineering course are:

- To enable students to develop competences associated with the product cycle in the context of motor sports engineering.
- To enable students to continually develop competences in team working and organisation in the context of cost limited engineering projects.
- To produce resourceful, competent, clear-thinking professional graduates with a range of engineering competences relevant to the motor sports industry, engineering industry and enterprise.
- To develop:
    - communications skills e.g. report writing, giving presentations.
    - skills appropriate to the organisation and operation of a team in the context of engineering projects.
    - competences in design through the use and selection of software and computer-based tools.
    - competences in numerical analysis appropriate to engineering and the modelling physical systems for design and manufacturing.
    - individual study skills e.g. time management, planning, use of different information sources.
- To provide the opportunity for students to experience some of the roles and the responsibilities within a professional race team.
- To satisfy the Engineering Council requirements for a BEng (Hons) for partial CEng.

There are additional aims for the MEng programme – please refer to the programme specifications for details.

1.2 Course Team

Head of School	Rob Wallace
Academic Lead	Sabuj Mallik
Course Leader	Graham Calderbank
(CM=Computing & Technology Building : W=Wharf Building)	

Staff	Room	Telephone	e-mail address
Joel Allison	CM131	01772-893252	JAllison@uclan.ac.uk
Muqi Wulan	CM037	01772-893247	MWulan@uclan.ac.uk
Matt Dickinson	CM123	01772-893261	MDickinson1@uclan.ac.uk
Graham Calderbank	CM028	01772-893318	GJCalderbank@uclan.ac.uk
Tony Broad	CM123	01772-893358	AIBroad@uclan.ac.uk
Justin Whitty	CM127	01772-893274	DRobinson@uclan.ac.uk
Patrick Ryan	CM109	01772-893273	PRyan1@uclan.ac.uk
Hadley Brooks	CM124	01772-893326	HLBrooks@uclan.ac.uk
Gonzalo Garcia-Atance …	CM221	01772-893323	GGarcia-AtanceFatjo@uclan.ac.uk
Martin Varley	CM134	01772-893272	MRVarley@uclan.ac.uk

1.3 Expertise of staff

The course team have a range of experiences and expertise. Course leader Graham Calderbank worked in the automotive industry for 5 years before moving to UCLan, where he has been involved with the motor sport and other engineering courses since 2008. Joel Allison is a graduate from the motor sport engineering course, and has subsequently worked with BAC on the Mono, amongst a number of other design projects for motor racing firms. In addition we have a number of staff on the course team involved in academic research relating to tribology (friction and wear) – specifically in internal combustion engines, 3D printing – which has become a popular manufacturing method in motor sport, and design and manufacture with composite materials.

1.4 Academic Advisor

You will be assigned an Academic Advisor who will provide additional academic advice and support during the year. They will be the first point of call for many of the questions that you might have during the year. Your Academic Advisor will be able to help you with personal development, providing insight and direction to enable you to realise your potential.

1.5 Administration details

Campus Admin Services provides academic administration support for students and staff and are located in the following hubs which open from 8.45am until 5.15pm Monday to Thursday and until 4.00pm on Fridays. The hub can provide general assistance and advice regarding specific processes such as extenuating circumstances, extensions and appeals.

Allen Building
Medicine
Dentistry
telephone: 01772 895566
email: AllenHub@uclan.ac.uk

Harris Building
Lancashire Law School
Humanities and the Social Sciences
Centre for Excellence in Learning and Teaching
telephone: 01772 891996/891997
email: HarrisHub@uclan.ac.uk

Foster Building
Forensic and Applied Sciences
Pharmacy and Biomedical Sciences
Psychology
Physical Sciences
telephone: 01772 891990/891991
email: FosterHub@uclan.ac.uk

Computing and Technology Building
Art, Design and Fashion
Computing
Journalism, Media and Performance
Engineering
telephone: 01772 891994/891995
email: CandTHub@uclan.ac.uk

Greenbank Building
Sport and Wellbeing
Management
Business
telephone: 01772 891992/891993
email: GreenbankHub@uclan.ac.uk

Brook Building
Community, Health and Midwifery
Nursing
Health Sciences
Social Work, Care and Community
telephone: 01772 891992/891993
email: BrookHub@uclan.ac.uk

1.6 Communication
The University expects you to use your UCLan email address and check regularly for messages from staff. If you send us email messages from other addresses they risk being filtered out as potential spam and discarded unread.

During your time at UCLan you may also be contacted by post – please ensure your addresses are kept up to date via MyUCLan. In addition, StarFish, Blackboard, notice-boards, etc. may also be used. Office hours can be found and appointments can be made through StarFish, as well as by email or face to face communication.

1.7 External Examiner
The University has appointed an External Examiner to your course who helps to ensure that the standards of your course are comparable to those provided at other higher education institutions in the UK. The name of this person, their position and home institution can be found below. If you wish to make contact with your External Examiner, you should do this through your Course Leader and not directly. External Examiner reports will be made available to you electronically.

Peter White (FIMechE) Coventry University

Abigail Summerfield (MIA) University Of Wales

2. Structure of the course

2.1 Overall structure

The course exists as part of the Modular Credit Accumulation and Transfer Scheme (MODCATS). The award requires that the student passes 360 credits for BEng (Hons), or 480 credits for MEng (Hons). Students wishing to follow part time study are counselled by a member of staff and a suitable programme of study developed.

Programme specifications for the BEng and MEng courses are provided in appendix 8.

Please note that the programme structures may be subject to minor modifications to reflect improvements/developments in the course or within industry. If this is the case your current year of study will not be affected and you will be notified of the changes for future year(s) of study.

2.2 Modules available

Each module is a self-contained block of learning with defined aims, learning outcomes and assessment. A standard module is worth 20 credits. It equates to the learning activity expected from one sixth of a full-time undergraduate year. Modules may be developed as half or double modules with credit allocated up to a maximum of 120 credits per module.

2.3 Module Registration Options

Discussions about your progression through the course normally take place in February each year. It is an opportunity for you to make plans for your study over the next academic year. The course team will tell you about the various modules / combinations available and you will both agree on the most appropriate (and legal) course of study for you.

If you wish to discuss your progression, or discuss a change of programme (e.g. from BEng to MEng) you should speak to your course leader or another member of the course team.

Transfers –

BEng to MEng - All students wishing to transfer from a BEng to an UCLan MEng are required to satisfy the course team that the course can be satisfactorily completed. The process involves an interview with a member of the course team and an average mark of 60% or above from the modules of stage 1 and stage 2.1 of the course. The entry point is determined by the module profile.

MEng to BEng - The transfer from MEng to BEng(Hons) might be made for a number of reasons including having extenuating circumstances or a poor academic performance. A poor academic performance would be considered at an examination board. The examination board would offer counselling during which time a student would be offered the transfer.

Students from other Universities are required to complete the accreditation of certificated prior learning (ACPL). The UCLan regulations do not allow APL of more than 2/3 of the modules required for an award. Applicants transferring into Motor Sports Engineering are only allowed to join the second year. Applicants transferring into Computer Aided Engineering can join the third year. All the applicants transferring into the BEng and MEng courses have accredited prior certified learning.

2.5 Study Time

2.5.1 Weekly timetable

Your timetable can be found using the following links:

From a mobile device: https://apps.uclan.ac.uk/mobilett/
From a computer/laptop: https://apps13.uclan.ac.uk/weeklyTimetable/

2.5.2 Expected hours of study

20 credits is a standard module size and equals 200 notional learning hours.
This translates to a total of 6 hours per 20 credit module per week, inclusive of your contact hours. So for a typical module you may have a 2 hour lecture, and a 1 hour tutorial, leaving you approximately 3 hours for self-directed study (further reading, tutorial questions, assignments, revision). This is thinking time – not coffee and biscuits time!

2.5.3 Attendance Requirements

You are required to attend all timetabled learning activities for each module. Notification of illness or exceptional requests for leave of absence must be made to the **Head of School, Course Leader, Year Tutor, or CAS Hub.** Contact details can be found in section 1.2 and 1.5.

If you have not gained the required authorisation for leave of absence, do not respond to communications from the University and if you are absent for four weeks or more, you may be deemed to have withdrawn from the course. If this is the case, then the date of

withdrawal will be recorded as the last day of attendance. For students from outside the EU the UK Border Agency will be notified you have non-attendance without good cause or withdraw from the course.

Your attendance for each module is recorded and monitored using the SAM system, which allows you to check your record of attendance at any time through myUCLan. If you find there is an error with your attendance record, please inform your module tutor.

Each time you are asked to enter your details on SAM you must remember that the University has a responsibility to keep information up to date and that **you must only enter your own details on the system**. To enter any other names would result in inaccurate records and be dishonest. Any student who is found to make false entries can be disciplined under the student guide to regulations.

3. Approaches to teaching and learning

3.1 Learning and teaching methods

Stage 1 includes lectures, seminars, individual assignments with a small number of group assignments. There are three hours per week in the student workshops with workbooks and a design and make project to develop experience of taking a product through a number of manufacturing processes. Use is made of specialist equipment within Wharf Building to introduce engineering principles.
Stage 2 includes individual and team assignments and projects of increasing complexity, some involving the use of software such as SolidWorks, ANSYS, and MATLAB. Use is made of the specialist equipment within Wharf Building to further develop competences and expertise around the product cycle and a belief in the fundamental relationships in engineering science, design, manufacture, management and organisation.

3.2 Study skills

Study Skills - ‘Ask Your Librarian’

https://www.uclan.ac.uk/students/support/study/it_library_trainer.php

You can book a one to one session with a subject Librarian via Starfish. These sessions will help with questions such as “My lecturer says I need a wider variety of sources in my references, what do I do?"
"I need to find research articles, where do I start?"
"How do I find the Journal of ...?"
"How do I use RefWorks?”

3.3 Learning resources

3.3.1 Learning Information Services (LIS)

The best place to start when exploring the Library resources available to you is;

- Your ‘Subject Guide’ can be found in the Library Resources
- Your ‘My Library’ tab in the Student Portal
- Library search

At UCLan all laboratories, workshops and other specialised equipment and facilities are centrally managed, thus making them available to users right across the campus. For further information please visit:
http://www.uclan.ac.uk/students/study/specialist_teaching_resources/index.php

3.4 Personal development planning

Your academic advisor will help you to develop a personal development plan through your course of meetings with him or her. This plan will help you to gain important skills and experiences which will help prepare you for your future careers.

3.5 Preparing for your career

We encourage all students to seek out extra-curricular opportunities to enhance your learning and development during the course of your studies. Our Motor Sport Club is set up to help provide this, particularly during the early years of your course. Here you will have the opportunity to work on the Formula UCLan race team, preparing and running the Formula Ford cars in the Avon Tyres FF1600 Northern Championship, and working on projects for the Formula Student car. Industrial placements also provide a superb opportunity to enhance your career prospects, which is normally commenced after your second year of study. There are also opportunities for assisting academic research staff with research projects and wider activities.

4. Student Support

Within the school of engineering you will find many people will be happy to help you. For module related support, you would normally contact the module tutor in the first instance. Likewise for course enquiries your course leader will assist. Your academic advisor will also be able to provide support and direction on a number of matters. For more general enquiries the you can visit any one of the hubs. There are helpful guides available online too, just visit:

http://www.uclan.ac.uk/students/

4.1 Academic Advisors

As a new student within the School of Engineering at the University of Central Lancashire (UCLan) you will be allocated to an academic advisor, who will work with you individually and in small groups to provide you with general support and guidance and to monitor your progress. Your academic advisor will be one of the team of academics that will teach you on your course whilst studying here at UCLan. You will be notified of your academic advisor and be given their contact details early in the academic year. You can also find out who your academic advisor and teaching team is using the Starfish system.

4.2 Students with disabilities

If you have a disability that may affect your studies, please either contact the Disability Advisory Service - disability@uclan.ac.uk - or let one of the course team know as soon as possible. You can find out who your Inclusive Support Advisor is using the Starfish system. With your agreement information will be passed on to the Disability Advisory Service. The University will make reasonable adjustments to accommodate your needs and to provide appropriate support for you to complete your study successfully. Where necessary, you will be asked for evidence to help identify appropriate adjustments.

Arrangements are made for students who have a disability/learning difficulty for which valid supporting evidence can be made available. Contact the Disability Adviser for advice and information, disability@uclan.ac.uk

4.3 Students' Union

The Students' Union offers thousands of volunteering opportunities ranging from representative to other leadership roles. We also advertise paid work and employ student staff on a variety of roles. You can find out more information on our website: http://www.uclansu.co.uk/

5. Assessment

5.1 Assessment Strategy

Please note that all modules will be assessed. You are expected to attempt all required assessments for each module for which you are registered, and to do so at the times scheduled unless authorised extensions, special arrangements for disability, or extenuating circumstances allow you to defer your assessment.

Your module leaders will provide information of the assessment strategy used during each series of module lectures/workshops and they are also detailed on the course specification documents.

5.2 Notification of assignments and examination arrangements

This information will be provided within your course supplement handbook and in your module information packs.

5.3 Referencing

For most of your assignments you will be expected to do some further reading, and you are required to think and produce increasingly original work around the work of others. **Do not fall into the 'plagiarism trap' either deliberately or by accident.** You need to give suitable credit to those that have produced the work that you are using.
You should reference any information you have refer to in your assignment using the Harvard referencing system (a guide to this system can be found on the WISER Blackboard space, accessed through the student portal).
You find information on the Harvard referencing system on the internet (google 'Harvard Referencing').

5.4 Confidential material

In the cases where Engineering students might use confidential information you should take guidance from your module tutor on your ethical and legal responsibilities to respect confidentiality and maintain anonymity of individuals within their assignments.

5.5 Cheating, plagiarism, collusion or re-presentation

Please refer to the information included in section 6.6 of the University Student Handbook for full definitions. The University uses an online Assessment Tool called Turnitin. A pseudo-Turnitin assignment will be set up using the School space on Blackboard to allow students to check as many drafts as the system allows before their final submission to the 'official' Turnitin assignment. Students are required to self-submit their own assignment on Turnitin and will be given access to the Originality Reports arising from each submission. In operating Turnitin, Schools must take steps to ensure that the University's requirement for all summative assessment to be marked anonymously is not undermined and therefore Turnitin reports should either be anonymised or considered separately from marking. Turnitin may

also be used to assist with plagiarism detection and collusion, where there is suspicion about individual piece(s) of work.

5.6 How do I know that my assessed work had been marked fairly?

Assessment is an integral part of the course. Module staff work closely together to design assessments, agree the marking criteria and approve final versions of assessments to ensure that these are appropriate. The criteria for assessment will be communicated to you clearly during the module teaching.

All module staff engage in development and training in assessment, marking and feedback. Once the assessments have been completed the module team will discuss the assessment methods and marking criteria, prior to starting to mark, so that there is a common understanding of what is expected of students. All assessed modules have moderation built into the marking process. Moderation involves sampling students' assessed work to make sure that the learning outcomes and agreed marking criteria have been interpreted and applied in the same way. This ensures that you and your fellow students are treated equitably and that the academic standards are applied consistently. During the marking process the module leader will co-ordinate moderation to ensure that at least 10% of assessed work (or a minimum of three pieces) has been reviewed by other markers and any concerns about consistency or accuracy addressed with the whole module team. Your work may or may not be part of this sample, but the processes for developing assessments and marking criteria as well as moderation mean that you can be confident that teaching staff are marking assessments to the same criteria. Module teams may then use feedback from moderation to improve clarity about the nature and purpose of future assessment, or to make changes if required.

Modules are also moderated externally. The module leader will arrange for the external examiner to receive a sample of work for review and comment. External examiners cannot change individual grades, but can act as 'critical friends' and confirm that marking standards are in line with other, similar courses in the sector. If, on reviewing the sample, external examiners feel that the marking criteria have not been applied consistently the work of the whole cohort will be reviewed.

6. Classification of Awards

The University publishes the principles underpinning the way in which awards and results are decided in Academic Regulations. Decisions about the overall classification of awards are made by Assessment Boards through the application of the academic and relevant course regulations.

In simple terms an undergraduate honours degree classification is based on:

1. For BEng (Hons): The Average Percentage Mark (APM) of your level 5 and 6 modules (generally taken in years 2 and 3 of a full time course) weighted 30:70.
2. For MEng (Hons): The higher of:
    a. The Average Percentage Mark (APM) of your level 5, 6 and 7 modules (generally taken in years 2, 3 and 4 of a full time course) weighted 20:30:40.
    b. The Average Percentage Mark (APM) of your level 6 and 7 modules (generally taken in years 3 and 4 of a full time course) weighted 30:40.

For the BEng programme, if the APM is near a borderline, 'at the discretion of the Assessment Board', students may be classified according to the academic judgement of the Assessment Board taking into account their overall profile and performance with the minimum requirement that:

1. A minimum of 3 modules (60 credits) at level 6 are in the classification band **and**

2. The APM is no lower than 2 percentage points below that required for the higher classification.'

In operating discretion for profiling Course Assessment Boards will use academic judgement and may refer to performance in core modules; the placement component, the dissertation/project or other factors which have been published to students.

7. Student Feedback

You can play an important part in the process of improving the quality of this course through the feedback you give. Module and course leaders are always interested in your feedback and it is invaluable to continually improve the course. You can also get involved in more formal student staff liaison committee meetings too (see below).

7.1 Student Staff Liaison Committee meetings (SSLCs)

Details of the Protocol for the operation of SSLCs is included in section 8.2 of the University Student Handbook.

The purpose of a SSLC meeting is to provide the opportunity for course representatives to feedback to staff about the course, the overall student experience and to inform developments which will improve future courses. These meetings are normally scheduled once per semester.

Meetings will be facilitated using guidelines and a record of the meeting will be provided with any decisions and / or responses made and / or actions taken as a result of the discussions held. The meetings include discussion of items forwarded by course representatives, normally related to the following agenda items (dependent on time of year).

The course team encourage student feedback in all areas and recognise that additional items for discussion may also be raised at the meeting. Agenda items can include:

- Update on actions completed since the last meeting
- Feedback about the previous year – discussion of external examiner's report; outcomes of National /UCLan student surveys.
- Review of enrolment / induction experience;
- Course organisation and management (from each individual year group, and the course overall);
- Experience of modules - teaching, assessment, feedback;
- Experience of academic support which may include e.g. Personal Development Planning, academic advisor arrangements;
- Other aspects of University life relevant to student experience e.g. learning resources, IT, library;
- Any other issues raised by students or staff.

8. Appendices

8.1 Programme Specification(s)

UNIVERSITY OF CENTRAL LANCASHIRE

Programme Specification

This Programme Specification provides a concise summary of the main features of the programme and the 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.

Sources of information on the programme can be found in Section 17

1. Awarding Institution / Body	University of Central Lancashire
2. Teaching Institution and Location of Delivery	University of Central Lancashire, Preston
3. University School/Centre	School of Engineering
4. External Accreditation	Institution of Engineering Designers Institution of Mechanical Engineers
5. Title of Final Award	BEng (Hons) Motor Sports Engineering
6. Modes of Attendance offered	Full Time, Part Time, Sandwich
7a) UCAS Code	H331
7b) JACS and HECOS Code	H331 (100201)
8. Relevant Subject Benchmarking Group(s)	QAA Engineering
9. Other external influences	Engineering Council UK-SPEC Accreditation requirements of IMechE Accreditation requirements of IED QAA Academic Infrastructure Codes of Practice Science, Technology, Engineering & Mathematics (STEM) government initiatives Motorsports Industry Association
10. Date of production/revision of this form	September 2018

11. Aims of the Programme

- **To attract able and motivated students of high-calibre, both from within UK and overseas and equip them with a thorough understanding of motor sports engineering principles and practices.**
- **To enable students to develop competences associated with the product cycle in the context of motor sports engineering.**
- **To enable students to continually develop competences in team working and organisation in the context of cost limited engineering projects.**
- **To produce resourceful, competent, clear-thinking professional graduates with a range of engineering competences relevant to the motor sports industry, engineering industry and enterprise.**
- **To develop:**

communications skills e.g. report writing, giving presentations.

skills appropriate to the organisation and operation of a team in the context of engineering projects. **competences in design through the use and selection of software and computer-based tools.** **competences in numerical analysis appropriate to engineering and the modelling physical systems for design and manufacturing.** **individual study skills e.g. time management, planning, use of different information sources.**
• **To provide the opportunity for students to experience some of the roles and the responsibilities within a professional race team.**
• **To satisfy the Engineering Council requirements for a BEng (Hons) for partial CEng.**

12. Learning Outcomes, Teaching, Learning and Assessment Methods

The Engineering Council sets the overall requirements for the Accreditation of Higher Education Programmes (AHEP) in engineering, in line with the UK Standard for Professional Engineering Competence (UK-SPEC). AHEP sets the learning outcome for accredited degree programmes in five categories: Science and Mathematics (SM); Engineering Analysis (EA); Design (D); Economic, Legal, Social, Ethical and Environmental Context (ET); Engineering Practice (EP). The latest edition of AHEP can be found at this link: http://www.engc.org.uk/ahep

The following sections A, B, C, and D are written in the UCLan format, referring to the corresponding learning outcomes in AHEP (for partial CEng). Postfix 'p' Indicates that the learning outcome is for partial CEng accreditation.

A. Knowledge and Understanding

A1. Competence in engineering science (shape, materials properties, loads, deformation). (SM1p, SM2p, SM3p)

A2. Knowledge and understanding of engineering design and manufacturing (processes and technology). (D1p, D2p, D5p)

A3. Knowledge and understanding of the principles, implications and limitations of ICT and of developing technologies in ICT. (SM3p, EP4p)

A4. Capable of management and organisation of the commercial and economic resources for design and manufacturing within the product cycle. (D1p, D2p, D3p, D5p)

A5. Ability to evaluate the basis and effects of commercial risks. (ET5p, ET6p)

Teaching and Learning Methods

Stage 1 includes lectures, seminars, individual assignments with a small number of group assignments. There are three hours per week in the student workshops with workbooks and a design and make project to develop experience of taking a product through a number of manufacturing processes. Use is made of specialist equipment within engineering to introduce engineering principles.

Stage 2 includes individual and team assignments and projects of increasing complexity some involving the use of relevant software packages. Use is made of the specialist equipment within engineering to further develop competences and expertise around the product cycle and a belief in the fundamental relationships in engineering science, design, manufacture, management and organisation.

Assessment methods

Stage 1 includes three formal end of year examinations, practical assignments and report, workbooks, presentations, small assignments.

Stage 2 includes reports, group work, individual working, designing, manufacturing, viva voce, portfolios and associated commentaries, major project research and decomposition, planning, assessing individual and group profiles and use of technology associated with design and manufacture such as simulation and operations software. There are formal examinations at level five and level six. One third of the final year is concerned with developing a car for the Formula Student competition. This requires considerable development of individual and group learning competences, critical appraisal and reflection of organisational and technical aspects of a major project. There is also a major individual project in the final year.

B. Subject-specific skills

B1. Ability to specify, plan and manage motor sports engineering designing and projects (individual and team working). (D4p, D5p, EP9p)

B2. Practical competence in designing and manufacturing components for motor sports (practical and laboratory skills). (EP1p, EP2p, EP3p, EP4p, EP5p, EP6p, EP7p)

B3. Ability to consider and prioritise relevant factors, including health, safety, environmental issues and risk, in the context of motor sports engineering and the product cycle. (ET1p, ET4p, ET5p, ET6p)

B4. Have the capacity and confidence to independently develop technical proficiencies to solve motor sports engineering problems. (EA1p, EA2p, EA4p)

B5. Able to evaluate and prioritise factors (such as materials, equipment, processes) in the context of motor sports engineering and the product cycle. (EP2p, EP1p)

B6. Ability to apply analytical design techniques to synthesise components and vehicle systems for motor sports. (EA3p, EA4p)

Teaching and Learning Methods

Stage 1 involves the introduction of engineering principles, design activity and technology to be related to a range of applications through formal lectures, seminars, tutorials, workshop and technical activities.
In stage 2 there is an increasing emphasis on integrating the aspects within design from physical laws to manufacturing organisation and methods through the direct introduction of work associated with the processes within the product cycle. Formal lectures, seminars, individual and team assignments and projects are used together with work based around the design and development and use of components and systems, manufacturing plant and technical equipment within School of Engineering. There are student-centred formal meeting every week and a master class for personal development on technical, organisational and commercial aspects of projects engineering. The major project is seminar based and requires the student to demonstrate a professional approach to a realistic engineering problem and identify and reflect on the project and subject specific and cognitive and transferable skills that are developed.

Assessment methods

Stage 1 includes workbooks, reports, presentations and small assignments and formal examinations. Stage 2 includes reports, group and individual working. There are examinations at level five and level six. Both individual and group presentations and viva voce are used for the major project and Formula Student work. Formula Student is used within one of the level 6 modules and requires the critical appraisal of engineering work in the context of the product cycle, group work and the integration of IT across a group in the soft building of a car currently on CAD software and the hard build in workshop space within School of Engineering.

C. Thinking Skills

In the context of the product cycle:

C1. Analysis & decomposition associated with engineering design & manufacture. (EA1p, D1p, D2p)

C2. Synthesis including effective use of CAE technology. (EA3p, EP2p)

C3. Application and analysis of the limitations and context of engineering principles. (SM1p, EA1p, EA3p)

C4. Decomposition, evaluation and solution of problems of uncertainty and increasing complexity. (D3p, EP8p, D4p)
C5. Recognise the broader aspects of engineering in the business and industrial environment. (D4p, ET2p, EP1p)

Teaching and Learning Methods

Stage 1 introduces engineering concepts and the use of learning outcomes in the curriculum. The approach is relatively direct and requires students to decompose engineering problems. Formal lectures supported with seminars and practical tests are used with a ‘hands-on’ approach in the workshops and drawing rooms as appropriate. There is initial use of CAD facilities, and presentations from students and external speakers.
Stage 2 requires students to demonstrate and increasingly reflect on integration across modules. This requires developing and increasing depth and level of engineering competences. The assignments increasingly use case studies based around engineering problems of growing complexity. This can be illustrated with the introductory project in Design and Manufacturing which is followed by a second more substantial piece of work. This continues with a major piece of group work and individual development for the design of a race car for Formula Student or similar competition.

Assessment methods

Stage 1 Assessment includes reports on practical tests, a design and make project, formal examinations and workbooks and drawings.
Stage 2 uses more marked developing assessment methods to require students to demonstrate integration across modules and disciplines and problems. These include formal reports with reflections on practical tests and designs, generating CAD models, reporting on computer based

calculations around engineering software, generating and analysing simulation models for manufacture. The assessment is generally based around the learning outcomes in order to indicate the direction and the requirements. In most modules at level 6 the extensive use of case studies is used.

D. Other skills relevant to employability and personal development

D1. Possesses inter-personal skills, mechanics and organisation of team working. (EP9p)
D2. Able to communicate effectively: (presentation, IT, written). (D6p, EP9p)
D3. Capable of searching, summarising and effectively using information. (EP4p, EP2p)
D4. Demonstrate appropriate level of numeracy. (EA1p, EA2p)
D5. Synthesise within a framework of relevant legal requirements. (ET5p, ET6p)
D6. Demonstrate a high level of professional and ethical conduct. (ET4p, ET5p, ET6p)

Teaching and Learning Methods

Teaching and learning methods include traditional lectures, tutorials, laboratory work, directed self-study, and project work. As the course progresses there is greater emphasis on independent learning and resource and time management. At stage 3 the emphasis is on developing an approach to problem solving through the solution of open ended problems, unfamiliar problems and the limitations and implications with solutions to problems.

Assessment methods

The assessment methods develop as students progress through the course with a change in the balance from the testing of specific leaning outcomes in a direct manner to requiring students to also develop the material used for reflection and commentary. The changing emphasis enables and requires students to develop life long learning skills through the development of the relating of competences to the work requirements.

13. Programme Structures*				14. Awards and Credits*
Level	**Module Code**	**Module Title**	**Credit rating**	
Level 6	MP3592	Motor Sports Systems (COMP)	20	**Bachelor Honours Degree in Motor Sports Engineering** Requires 360 credits including a minimum of 220 at Level 5 or above and 100 at Level 6
	MP3604	Advanced CAD (COMP)	20	
	ER3597	Motor Sports Design (COMP)	20	
	ER3598	Motor Sports Development (COMP)	20	**Bachelor Degree in Motor Sports Engineering** Requires 320 credits including a minimum of 180 at Level 5 or above and 60 at Level 6
	MP3999	Project (COMP)	40	
Level 5	MP2899	Industrial Placement	120 *notional credits*	Students who also successfully complete module MP2899 will receive the award "with Industrial Placement"
	SC2153	Further Engineering Mathematics and Simulation (O)	20	**Diploma of Higher Education in Motor Sports Engineering** Requires 240 credits including a minimum of 100 at Level 5 or above
	MP2714	CAD and Simulation (O)	20	
	MP2721	Operations Management A (COMP)	20	
	MP2570	Engineering Design and Manufacture (COMP)	40	
	MP2578	Motor Sports Mechanics (COMP)	20	
	MP2576	Thermo-fluids (COMP)	20	
Level 4	ER1010	Engineering Analysis (COMP)	30	**Certificate of Higher Education** Requires 120 credits at Level 4 or above
	ER1020	Engineering Design (COMP)	30	
	ER1030	Engineering Science (COMP)	30	
	ER1632	Race Car Anatomy (COMP)	30	
Levels 3 (FE)	ERC001	Study Skills	20	Students who exit after the Foundation year will receive a transcript of their modules and grades
	ERC002	Basic Mathematics	20	
	ERC003	Information and Communications Technology	20	
	ERC004	Practical Skills	20	
	ERC005	Design Studies	20	
	ERC006	Analytical Studies	20	

15. Personal Development Planning

Personal Development Planning (PDP) is:

- Reflection on learning, performance, and achievement
- Planning for personal, educational, and career development.

PDP involves review and reflection involving academic study, extra-curricular activities and career planning. It results in an understanding and ownership of learning. The student will be introduced to PDP during tutorial sessions which should be seen as an opportunity to develop a plan for the whole of the student's time at University.

Since learning is a lifelong process the work in PDP is not assessed. There are many similarities to work-based learning, and Continued Professional Development (CPD) - which is required for membership of professional societies. The skills in PDP are key components of employability - self-reflection, recording, target setting, action planning and monitoring.

Web based materials relevant to PDP are found at:
Personal Development Planning www.uclan.ac.uk/ldu/resources/pdp/intro1.htm
Skills Learning Resources www.uclan.ac.uk/lskills/TLTP3/entersite.html
There is also information available which can be located using a web search engine.
At Induction the student takes part in a session involving a range of self-assessment exercises. This is followed by early in Semester 1 the student being recommended to access the Personal Development Planning web page (above), where there are a range of activities and exercises. The results of the activity or exercise are kept together in an A4 folder. A paper based system is suggested, due to concerns about the security, privacy, and long-term accessibility of records.
This activity is reinforced by all first year students taking part in an event organised by 'Frontier Education' and based on the Mongolian 'Yurts' form of accommodation. This encourages communication and team working between students and fellow students, and between students and staff.
Subsequently during tutorial sessions there will be discussion around PDP elements and in particular anything the student may have found difficult, or in which he/she needs assistance. Alternative approaches may be considered and discussed, if the student has particular issues. By the end of their University studies, the student is advised to have completed and reviewed all the activities and exercises

16. Admissions criteria *
(including agreed tariffs for entry with advanced standing)
**Correct as at date of approval. For latest information, please consult the University's website.*

Minimum entry requirements for degree level study for students of Curriculum 2000 will be a 12 unit profile, which must be made up from one of the following configurations:
Three A2 level subjects.
Two A2 level subjects plus one single award Advanced VCE.
One A2 level subject plus one double award Advanced VCE.
One A2 level subject plus two single award Advanced VCE.
Plus evidence of Key Skills.
Although Year 12 (AS) qualifications will be a useful indicator of potential, offers of places will only be made against total achievement at the end of Year 13.

For guidance entry requirements for BEng (Hons) Motor Sports Engineering should be 280 points including Mathematics and Science and a third such as Technology at A2 level and at least five GCSEs at Grade B or above including Maths and English.

Other acceptable qualifications include:
Scottish Certificate of Education Higher Grade passes (AAAA)
Irish Leaving Certificate Higher Grade passes (AAABB)
International Baccalaureate (32 points)
An appropriate BTEC Certificate or Diploma - an average of distinction grade must have been achieved.
Kitemarked Access Course.
Applications from individuals with non-standard qualifications, relevant work or life experience and who can demonstrate the ability to cope with and benefit from degree-level studies are considered.
If an applicant has gained a BTEC HND in Engineering it may be possible to achieved entry with advanced standing. Applicants should note that a minimum period of study may apply.

Applicants seeking entry with advanced standing should note that the maximum entry point is to the second year of study.

17. Key sources of information about the programme

- **Factsheet; Prospectus; University website uclan.ac.uk; Motor Sports information sheet**

18. Curriculum Skills Map

Please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

Level	Module Code	Module Title	Core (C), Compulsory (COMP) or Option (O)	Programme Learning Outcomes																						
				Knowledge and understanding					Subject-specific Skills						Thinking Skills						Other skills relevant to employability and personal development					
				A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	D1	D2	D3	D4	D5	D6
LEVEL 6	MP3999	Project	COMP	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		✓
	MP3604	Advanced CAD	COMP		✓	✓					✓	✓			✓	✓	✓	✓			✓	✓	✓		
	ER3597	Motor Sport Design	COMP	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ER3598	Motor Sport Development	COMP		✓	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓
	MP3592	Motor Sports Systems	COMP	✓			✓				✓	✓			✓	✓	✓	✓				✓	✓		
LEVEL 5	MP2578	Motor Sports Mechanics	COMP	✓		✓			✓	✓					✓		✓	✓			✓	✓	✓		
	MP2570	Engineering Design & Man	COMP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	MP2721	Ops Man A	COMP		✓	✓	✓	✓	✓		✓	✓			✓	✓	✓	✓		✓	✓	✓		✓	✓
	SC2153	Further Engineering Math & Simulation	O	✓	✓		✓		✓				✓		✓	✓	✓	✓				✓			
	MP2576	Thermo-fluids	COMP	✓		✓						✓			✓	✓	✓	✓			✓	✓	✓		
	MP2714	CAD and Simulation	O	✓	✓	✓				✓		✓		✓	✓	✓	✓				✓	✓	✓		
e.g. LEVEL 4	ER1030	Eng Science	COMP		✓	✓			✓	✓							✓	✓			✓		✓		
	ER1010	Eng Analysis	COMP			✓						✓				✓		✓				✓	✓		
	ER1020	Eng Design	COMP		✓	✓						✓			✓	✓					✓	✓			
	ER1632	Race Car Anat	COMP	✓	✓					✓		✓			✓		✓	✓			✓	✓	✓		
	ER1030	Eng Science	COMP		✓	✓			✓	✓							✓	✓			✓		✓		
	ER1010	Eng Analysis	COMP			✓						✓				✓		✓				✓	✓		
	ER1020	Eng Design	COMP		✓	✓						✓			✓	✓					✓	✓			

Note: *Mapping to other external frameworks, e.g. professional/statutory bodies, will be included within Student Course Handbooks*

19. LEARNING OUTCOMES FOR EXIT AWARDS:

Learning outcomes for the award of: CertHE

A1: Competence in some aspects of engineering science (shape, materials properties, loads, deformation).
A2: Knowledge and understanding of basic engineering design and manufacturing (processes and technology).
A3: Knowledge and understanding of some of the principles, implications and limitations of ICT and of developing technologies in ICT.

B1: Ability to specify, plan and manage some aspects of motor sports engineering designing and projects (individual and team working).

B2: Competence in designing and manufacturing components for motor sports (as beginner).

B4: Have the capacity and confidence to independently develop technical proficiencies to solve some aspects motor sports engineering problems.

C2: Synthesis including know-how of computer aided engineering and technology.

C3: Application and analysis of the limitations and context of engineering principles.

C4: Decomposition, evaluation and solution of problems of increasing complexity.
Recognise many aspects of engineering in the business and industrial environment.
Possesses appropriate level of inter-personal skills, mechanics and organisation of team working.

D2: Able to communicate effectively: (presentation, IT, written).

D3: Capable of searching, summarising and effectively using information.

D4: Demonstrate appropriate level of numeracy.

Learning outcomes for the award of: DipHE

A1: Competence in many aspects of engineering science (shape, materials properties, loads, deformation).
A2: Knowledge and understanding of engineering design and manufacturing (processes and technology).
A3: Knowledge and understanding of much of the principles, implications and limitations of ICT and of developing technologies in ICT.

A4: Capable of management and organisation of many aspects of the commercial and economic resources for design and manufacturing within the product cycle.
A5: Knowledge and understanding of the basis and effects of commercial risks.

B1: Ability to specify, plan and manage many aspects of motor sports engineering designing and projects (individual and team working).

B2: Competence in designing and manufacturing components for motor sports.

B3: Ability to consider and prioritise relevant factors, including health, safety, environmental issues and risk, in the context of motor sports engineering and the product cycle.

B4: Have the capacity and confidence to independently develop technical proficiencies to solve many aspects motor sports engineering problems.

B5: Able to identify and prioritise factors in the context of motor sports engineering and the product cycle.
B6: Ability to apply analytical design techniques to synthesise components and vehicle systems for motor sports.

C1: Capable of analysis & decomposition associated with engineering design & manufacture.

C2: Synthesis including application of computer aided engineering and technology.

C3: Application and analysis of the limitations and context of engineering principles.

C4: Decomposition, evaluation and solution of problems of increasing complexity.
C5: Recognise many aspects of engineering in the business and industrial environment.

Possesses appropriate level of inter-personal skills, mechanics and organisation of team working.

D2: Able to communicate effectively: (presentation, IT, written).

D3: Capable of searching, summarising and effectively using information.

D4: Demonstrate appropriate level of numeracy.

D5: Able to work within a framework of relevant legal requirements.

D6: Demonstrate an appropriate level of professional and ethical conduct.

Learning outcomes for the award of: BEng

A1: Competence in engineering science (shape, materials properties, loads, deformation).
A2: Knowledge and understanding of engineering design and manufacturing (processes and technology).
A3: Knowledge and understanding of much of the principles, implications and limitations of ICT and of developing technologies in ICT.

A4: Capable of management and organisation of all aspects of the commercial and economic resources for design and manufacturing within the product cycle.
A5: Knowledge and understanding of the basis and effects of commercial risks.

B1: Ability to specify, plan and manage all aspects of motor sports engineering designing and projects (individual and team working).

B2: Competence in designing and manufacturing components for motor sports.

B3: Ability to consider and prioritise relevant factors, including health, safety, environmental issues and risk, in the context of motor sports engineering and the product cycle.

B4: Have the capacity and confidence to independently develop technical proficiencies to solve all aspects motor sports engineering problems.

B5: Able to evaluate and prioritise factors in the context of motor sports engineering and the product cycle.
B6: Ability to apply analytical design techniques to synthesise components and vehicle systems for motor sports.

C1: Capable of analysis & decomposition associated with engineering design & manufacture.

C2: Synthesis including application and evaluation of computer aided engineering and technology.

C3: Application and analysis of the limitations and context of engineering principles.

C4: Decomposition, evaluation and solution of problems of increasing complexity.
Recognise many aspects of engineering in the business and industrial environment.
D1: Possesses appropriate level of inter-personal skills, mechanics and organisation of team working.

D2: Able to communicate effectively: (presentation, IT, written).

D3: Capable of searching, summarising and effectively using information.

D4: Demonstrate appropriate level of numeracy.

D5: Able to work within a framework of relevant legal requirements.

D6: Demonstrate an appropriate level of professional and ethical conduct.

UNIVERSITY OF CENTRAL LANCASHIRE

Programme Specification

This Programme Specification provides a concise summary of the main features of the programme and the 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.

Sources of information on the programme can be found in Section 17

1. Awarding Institution / Body	University of Central Lancashire
2. Teaching Institution and Location of Delivery	University of Central Lancashire, Preston
3. University School/Centre	School of Engineering
4. External Accreditation	Institution of Engineering Designers Institution of Mechanical Engineers
5. Title of Final Award	MEng (Hons) Motor Sports Engineering
6. Modes of Attendance offered	Full Time, Part Time, Sandwich
7a) UCAS Code	Full Time H334 Sandwich H339
7b) JACS and HECOS Code	H331 (100201)
8. Relevant Subject Benchmarking Group(s)	QAA Engineering
9. Other external influences	Engineering Council UK-SPEC Accreditation requirements of IMechE Accreditation requirements of IED QAA Academic Infrastructure Codes of Practice Science, Technology, Engineering & Mathematics (STEM) government initiatives Motorsports Industry Association
10. Date of production/revision of this form	September 2018
11. Aims of the Programme	
To attract able and motivated students of high-calibre, both from within UK and overseas and equip them with a thorough understanding of motor sports engineering principles and practices.	
To enable students to develop competences associated with the product cycle in the context of motor sports engineering	
To provide students with an in-depth understanding of some specialised areas within motor sports engineering, through individual and team-based projects, usually in industrial environment.	

To produce resourceful, competent, clear-thinking professional graduates with a range of engineering competences relevant to the motor sports industry, engineering industry and enterprise.
To prepare students for professional careers in motor sports engineering those require high level of judgement, leadership, initiative, delegation and decision-making responsibilities.
To provide the opportunity for students to experience the roles and the responsibilities within a professional race team.
To fulfil educational requirements for future progression onto Chartered Engineer status.

12. Learning Outcomes, Teaching, Learning and Assessment Methods

The Engineering Council sets the overall requirements for the Accreditation of Higher Education Programmes (AHEP) in engineering, in line with the UK Standard for Professional Engineering Competence (UK-SPEC). AHEP sets the learning outcome for accredited degree programmes in five categories: Science and Mathematics (SM); Engineering Analysis (EA); Design (D); Economic, Legal, Social, Ethical and Environmental Context (ET); Engineering Practice (EP). The latest edition of AHEP can be found at this link: http://www.engc.org.uk/ahep

The following sections A, B, C, and D are written in the UCLan format, referring to the corresponding learning outcomes in AHEP (for partial CEng). Postfix 'p' Indicates that the learning outcome is for partial CEng accreditation.

A. Knowledge and Understanding

A1. Competence in engineering science (shape, materials properties, loads, deformation). (SM1m, SM2m, SM3m)

A2. Extensive knowledge and understanding of engineering design and manufacturing (processes and technology). (D1m, D2m, D5m, SM4m)

A3. Comprehensive knowledge and understanding of the principles, implications and limitations of ICT and of developing technologies in ICT. (SM3m, EP4m)

A4. Capable of management and organisation of the commercial and economic resources for design and manufacturing within the product cycle. (D1m, D2m, D3m, D5m)

A5. Ability to evaluate the basis and effects of commercial risks. (ET5m, ET6m)

A6. Define, utilise and evaluate appropriate business practices to strategic and tactical issues. (EP1m, EP10m)

Teaching and Learning Methods

Stage 1 includes lectures, seminars, individual assignments with a small number of group assignments. There are three hours per week in the student workshops with workbooks and a design and make project to develop experience of taking a product through a number of manufacturing processes. Use is made of specialist equipment within School of Engineering to introduce engineering principles.

Stage 2 includes individual and team assignments and projects of increasing complexity some involving the use of relevant software packages. Use is made of the specialist equipment within engineering to further develop competences and expertise around the product cycle and a belief in the fundamental relationships in engineering science, design, manufacture and organisation.

Stage 3 is concerned with the consolidation and development of competences associated with professional engineers. You will need to develop and adapt existing methods and synthesise and develop new methods to solve familiar and unfamiliar problems and identify any limitations or problematic aspects within solutions.

Assessment methods

Stage 1 includes three formal end of year examinations, practical assignments and report, workbooks, presentations, small assignments.

Stage 2 includes reports, group work, individual working, designing, manufacturing, viva voce, portfolios and associated commentaries, major project research and decomposition, planning, assessing individual and group profiles and use of technology associated with design and manufacture such as CAD, simulation, and operations software. There are formal examinations at level five and level six. A major part of third year is concerned with developing a car for the Formula Student competition. This requires considerable development of individual and group learning competences, critical appraisal and reflection of organisational and technical aspects of a major project.

Stage 3 includes reports, commentaries on portfolios and group working. The emphasis is on the analysis, decomposition, synthesis, evaluation and critical appraisal associated with problem solving and the full spectrum of the implications with any particular aspect.

B. Subject-specific skills

B1. Ability to specify, plan and manage motor sports engineering designing and projects (individual and team working). (D4m, D5m, EP9m, EP11m)

B2. Extensive practical competence in designing and manufacturing components for motor sports (practical and laboratory skills). (EP1m, EP2m, EP3m, EP4m, EP5m, EP6m, EP7m, D8m)

B3. Ability to consider and prioritise relevant factors, including health, safety, environmental issues and risk, in the context of motor sports engineering and the product cycle. (ET1m, ET4m, ET5m, ET6m, ET7m, EP10m)

B4. Have the capacity and confidence to independently develop technical proficiencies to solve motor sports engineering problems. (EA1m, EA2m, EA4m)

B5. Able to evaluate and prioritise factors (such as materials, equipment, processes) in the context of motor sports engineering and the product cycle. (EP2m, EP1m)

B6. Ability to apply analytical design techniques with greater confidence, to synthesise components and vehicle systems for motor sports. (EA3m, EA4m, SM5m)

Teaching and Learning Methods

Stage 1 involves the introduction of engineering principles, design activity and technology to be related to a range of applications through formal lectures, seminars, tutorials, workshop and technical activities.

In stage 2 there is an increasing emphasis on integrating the aspects within design from physical laws to manufacturing organisation and methods through the direct introduction of work associated with the processes within the product cycle. Formal lectures, seminars, individual and team assignments and projects are used together with work based around the design and development and use of components and systems, manufacturing plant and technical equipment within engineering. Formula Student has student-centred formal meeting every week and a master class for personal development on technical, organisational and commercial aspects of projects engineering.

In stage 3 the emphasis is on a wide variety of issues and aspects in engineering and the responsibilities of the professional engineer. The development of the competences associated with the responsibilities of the professional engineer is required. The project is student centred learning with support from a project tutor.

Assessment methods

Stage 1 includes workbooks, reports, presentations and small assignments and formal examinations. Stage 2 includes reports, group and individual working. There are examinations at level five and level six. Both individual and group presentations and viva voce are used. Formula Student is used within a level 6 module and requires the critical appraisal of engineering work in the context of the product cycle, group work and the integration of IT across a group. Stage 3 continues the spectrum of assessments from stage two and an increased requirement of critical appraisal, decomposition and analysis of all the activities in the context of both the product cycle and society in general. The project is assessed by a combination of reports and viva voce

C. Thinking Skills

In the context of the product cycle:

C1. Critical analysis & decomposition associated with engineering design & manufacture. (EA1m, D1m, D2m)

C2. Synthesis including effective use and improvement of computer aided engineering and technology. (EA3m, EP2m, EA5m)

C3. Application and critical analysis of the limitations and context of engineering principles. (SM1m, EA1m, EA3m)

C4. Decomposition, evaluation and solution of problems of uncertainty and increasing complexity. (D3m, EP8m, D4m, EA6m, D7m)

C5. Recognise the broader aspects of engineering in the business and industrial environment. (D4m, ET2m, EP1m, SM6m, ET8m)

Teaching and Learning Methods

Stage 1 introduces engineering concepts and the use of learning outcomes in the curriculum. The approach is relatively direct and requires students to decompose engineering problems. Formal lectures supported with seminars and practical tests are used with a ‘hands-on’ approach in the workshops and drawing rooms as appropriate. There is initial use of CAD facilities, and presentations from students and external speakers.

Stage 2 requires the increasing and developing levels of competences associated with the product cycle. The assignments increasingly use of case studies based around increasingly complex engineering problems. This can be illustrated with the introductory project in Design and Manufacturing which is followed by a second more substantial piece of work. This continues with a major piece of group work and individual development for the design of a race car for Formula Student or similar competition.

Stage 3 is concerned with the approach of the professional engineer and aspects with postgraduate work in research and professional responsibility. Critical appraisal and review are the normal activities to be expected and must be in context of the problem, the solution and also the need to innovate and appreciate and analyse different viewpoints.

Assessment methods

Stage 1 includes reports on practical tests, a design and make project, formal examinations and workbooks and drawings.
Stage 2 uses more marked developing assessment methods to require students to demonstrate integration across modules and disciplines and problems. These include formal reports with reflections on practical tests and designs, generating CAD models, reporting on computer based calculations around engineering software, generating and analysing simulation models for manufacture. The assessment is generally based around the learning outcomes in order to indicate the direction and the requirements. In most modules at level 6 the extensive use of case studies is used.
Stage 3 is focussed around the learning outcomes associated with the roles, responsibilities and formation of engineers. There is a requirement to extend competences from stage 2 through the introduction of the need to examine boundaries on a number of dimensions. The problems are less well defined and the assessment is such that there is an expectation that boundaries will be defined and the limitations and implications explored and defined and assessed. The major project extends the time management and project competences and requires reflection, commentary and critical appraisal on a variety of aspects around personal working and technical developments and the wider implications.

D. Other skills relevant to employability and personal development

D1. Possesses leadership, inter-personal skills, mechanics and organisation of team working. (EP9m, EP11m)
D2. Able to communicate effectively: (presentation, IT, written). (D6m, EP9m)
D3. Capable of searching, summarising and effectively using information. (EP2m, EP4m)
D4. Demonstrate high level of numeracy. (EA1m, EA2m)
D5. Synthesise within a framework of relevant legal requirements. (ET5m, ET6m, ET7m)
D6. Demonstrate a high level of professional and ethical conduct. (ET4m, ET5m, ET6m)

Teaching and Learning Methods

Teaching and learning methods include traditional lectures, tutorials, laboratory work, directed self-study, and project work. As the course progresses there is greater emphasis on independent learning and resource and time management. The individual project and Formula Student work require analysis and reflection across a variety of aspects of the processes within the product cycle and those generic aspects related to enterprise and management. It is these aspects together with earlier opportunities to be actively involved with the motor sports that develop your employability as a professional engineer in motor sports. At stage 3 the emphasis is on developing an approach to problem solving through the solution of open ended problems, unfamiliar problems and the limitations and implications with solutions to problems.

Assessment methods

The assessment methods develop as students progress through the course with a change in the balance from the testing of specific leaning outcomes in a direct manner to requiring students to also develop the material used for reflection and commentary. The changing emphasis enables and requires students to develop life long learning skills through the development of the relating of competences to the work requirements.

13. Programme Structures*				14. Awards and Credits*
Level	**Module Code**	**Module Title**	**Credit rating**	
Level 7	MP4580	The Engineer and Society (COMP)	20	**Master of Engineering with Honours Degree in Motor Sports Engineering** Requires 480 credits including a minimum of 360 at Level 5, 220 at Level 6 and 120 at Level 7
	ER4587	Group Project (COMP)	20	
	MP4582	Advanced Tribology (COMP)	20	
	MP4583	Advanced Engineering Systems (COMP)	20	
	ER4995	Project (C)	20	
	ER4220	Motorsport Vehicle Dynamics (COMP)	20	
Level 6	MP3592	Motor Sports Systems (COMP)	20	**Bachelor Honours Degree in Motor Sports Engineering** Requires 360 credits including a minimum of 220 at Level 5 or above and 100 at Level 6 **Bachelor Degree in Motor Sports Engineering** Requires 320 credits including a minimum of 180 at Level 5 or above and 60 at Level 6
	MP3604	Advanced CAD (COMP)	20	
	MP3672	Engineering Simulation (COMP)	20	
	MP3713	Mechanics and Materials (COMP)	20	
	ER3598	Motor Sports Design (COMP)	20	
	ER3599	Motor Sports Development (COMP)	20	
	MP3995*	Project (COMP) **Comp for exit award of BEng Hons not normally studied by MEng students (would replace either MP3713 or MP3672)*	20	
Level 5	MP2899	Industrial Placement	120 *notional credits*	Students who also successfully complete module MP2899 will receive the award "with Industrial Placement"
	SC2153	Further Engineering Mathematics and Simulation (O)	20	**Diploma of Higher Education in Motor Sports Engineering** Requires 240 credits including a minimum of 100 at Level 5 or above
	MP2714	CAD and Simulation (O)	20	
	MP2721	Operations Management A (COMP)	20	
	MP2570	Engineering Design and Manufacture (COMP)	40	
	MP2578	Motor Sports Mechanics (COMP)	20	
	MP2576	Thermo-fluids (COMP)	20	
Level 4	ER1010	Engineering Analysis (COMP)	30	**Certificate of Higher Education** Requires 120 credits at Level 4 or above
	ER1020	Engineering Design (COMP)	30	
	ER1030	Engineering Science (COMP)	30	
	ER1632	Race Car Anatomy (COMP)	30	
Levels 3 (FE)	ERC001	Study Skills	20	Students who exit after the Foundation year will receive a transcript of their modules and grades
	ERC002	Basic Mathematics	20	
	ERC003	Information and Communications Technology	20	
	ERC004	Practical Skills	20	
	ERC005	Design Studies	20	
	ERC006	Analytical Studies	20	
15. Personal Development Planning				

Personal Development Planning (PDP) is:

- Reflection on learning, performance, and achievement
- Planning for personal, educational, and career development.

PDP involves review and reflection involving academic study, extra-curricular activities and career planning. It results in an understanding and ownership of learning. The student will be introduced to PDP during tutorial sessions which should be seen as an opportunity to develop a plan for the whole of the student's time at University.

Since learning is a lifelong process the work in PDP is not assessed. There are many similarities to work-based learning, and Continued Professional Development (CPD) - which is required for membership of professional societies. The skills in PDP are key components of employability - self-reflection, recording, target setting, action planning and monitoring.

Web based materials relevant to PDP are found at:

Personal Development Planning www.uclan.ac.uk/ldu/resources/pdp/intro1.htm
Skills Learning Resources www.uclan.ac.uk/lskills/TLTP3/entersite.html

There is also information available which can be located using a web search engine.

At Induction the student takes part in a session involving a range of self-assessment exercises. This is followed by early in Semester 1 the student being recommended to access the Personal Development Planning web page (above), where there are a range of activities and exercises. The results of the activity or exercise are kept together in an A4 folder. A paper based system is suggested, due to concerns about the security, privacy, and long-term accessibility of records.

This activity is reinforced by all first year students taking part in an event organised by 'Frontier Education' and based on the Mongolian 'Yurts' form of accommodation. This encourages communication and team working between students and fellow students, and between students and staff.

Subsequently during tutorial sessions there will be discussion around PDP elements and in particular anything the student may have found difficult, or in which he/she needs assistance. Alternative approaches may be considered and discussed, if the student has particular issues. By the end of their University studies, the student is advised to have completed and reviewed all the activities and exercises

16. Admissions criteria *

(including agreed tariffs for entry with advanced standing)

**Correct as at date of approval. For latest information, please consult the University's website.*

Minimum entry requirements for degree level study for students of Curriculum 2000 will be a 12 unit profile, which must be made up from one of the following configurations:

Three A2 level subjects.
Two A2 level subjects plus one single award Advanced VCE.
One A2 level subject plus one double award Advanced VCE.
One A2 level subject plus two single award Advanced VCE.
Plus evidence of Key Skills.

Although Year 12 (AS) qualifications will be a useful indicator of potential, offers of places will only be made against total achievement at the end of Year 13.

For guidance entry requirements for MEng (Hons) Motor Sports Engineering should be 300 points including Mathematics and Science and a third such as Technology at A2 level and at least five GCSEs at Grade B or above including Maths and English.

Other acceptable qualifications include:

Scottish Certificate of Education Higher Grade passes (AAAA)
Irish Leaving Certificate Higher Grade passes (AAABB)
International Baccalaureate (32 points)
An appropriate BTEC Certificate or Diploma - an average of distinction grade must have been achieved.
Kitemarked Access Course.

Applications from individuals with non-standard qualifications, relevant work or life experience and who can demonstrate the ability to cope with and benefit from degree-level studies are considered.

If an applicant has gained a BTEC HND in Engineering it may be possible to achieved entry with advanced standing. Applicants should note that a minimum period of study may apply.

Applicants seeking entry with advanced standing should note that the maximum entry point is to the second year of study.

17. Key sources of information about the programme

• **Factsheet; Prospectus; University website uclan.ac.uk; Motor Sports information sheet**

18. Curriculum Skills Map

Please tick in the relevant boxes where individual Programme Learning Outcomes are being assessed

Level	Module Code	Module Title	Core (C), Compulsory (COMP) or Option (O)	Programme Learning Outcomes																						
				Knowledge and understanding					Subject-specific Skills						Thinking Skills					Other skills relevant to employability and personal development						
				A1	A2	A3	A4	A5	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	D1	D2	D3	D4	D5	D6
LEVEL 7	ER4995	Project	COMP	✓	✓	✓	✓			✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓
	MP4583	Adv Eng Sys	COMP	✓		✓	✓			✓	✓	✓	✓			✓	✓	✓	✓			✓	✓	✓	
	MP4582	Adv Tribology	COMP	✓		✓	✓			✓	✓	✓	✓			✓	✓	✓	✓			✓	✓	✓	
	ER4587	Group Project	C	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	MP4580	Eng'r & Soc	COMP			✓	✓	✓	✓			✓				✓	✓		✓		✓	✓	✓	✓	✓
	ER4220	Motorsport Vehicle Dynamics	COMP		✓		✓			✓	✓	✓	✓	✓	✓	✓	✓					✓			
LEVEL 6	MP3995*	Project	COMP *(*BEng exit only)*	✓	✓	✓			✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓	✓	✓		✓
	MP3672	Engineering Simulation	COMP	✓		✓						✓	✓			✓	✓	✓				✓	✓	✓	
	MP3713	Mechanics and Materials	COMP	✓		✓							✓			✓		✓	✓			✓	✓	✓	
	MP3604	Advanced CAD	COMP		✓	✓					✓	✓			✓	✓	✓	✓			✓	✓	✓		
	ER3598	Motor Sport Design	COMP	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	ER3599	Motor Sport Development	COMP		✓	✓	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓		✓	✓
	MP3592	Motor Sports Systems	COMP	✓			✓				✓	✓			✓	✓	✓	✓				✓	✓		
LEVEL 5	MP2578	Motor Sports Mechanics	COMP	✓		✓			✓	✓					✓		✓	✓			✓	✓	✓		
	MP2570	Engineering Design & Man	COMP	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
	MP2721	Ops Man A	COMP		✓	✓	✓	✓	✓		✓	✓			✓	✓	✓	✓		✓	✓	✓		✓	✓
	SC2153	Further Engineering Math & Simulation	O	✓	✓		✓		✓				✓		✓	✓	✓	✓				✓			
	MP2576	Thermo-fluids	COMP	✓		✓						✓			✓	✓	✓	✓			✓	✓	✓		
	MP2714	CAD and Simulation	O	✓	✓	✓				✓		✓		✓	✓	✓	✓				✓	✓	✓		
e.g. LEVE L 4	ER1030	Eng Science	COMP		✓	✓			✓	✓							✓	✓			✓		✓		
	ER1010	Eng Analysis	COMP			✓						✓				✓		✓				✓	✓		
	ER1020	Eng Design	COMP		✓	✓						✓			✓	✓					✓	✓			

ER1632	Race Car Anat	COMP	✓	✓					✓		✓			✓		✓	✓			✓	✓	✓		
ER1030	Eng Science	COMP		✓	✓			✓	✓							✓	✓			✓		✓		
ER1010	Eng Analysis	COMP			✓						✓				✓		✓				✓	✓		
ER1020	Eng Design	COMP		✓	✓						✓			✓	✓					✓	✓			

Note: *Mapping to other external frameworks, e.g. professional/statutory bodies, will be included within Student Course Handbooks*

19. LEARNING OUTCOMES FOR EXIT AWARDS:

Learning outcomes for the award of: CertHE

A1: Competence in some aspects of engineering science (shape, materials properties, loads, deformation).
A2: Knowledge and understanding of basic engineering design and manufacturing (processes and technology).
A3: Knowledge and understanding of some of the principles, implications and limitations of ICT and of developing technologies in ICT.

B1: Ability to specify, plan and manage some aspects of motor sports engineering designing and projects (individual and team working).

B2: Competence in designing and manufacturing components for motor sports (as beginner).

B4: Have the capacity and confidence to independently develop technical proficiencies to solve some aspects motor sports engineering problems.

C2: Synthesis including know-how of computer aided engineering and technology.

C3: Application and analysis of the limitations and context of engineering principles.

C4: Decomposition, evaluation and solution of problems of increasing complexity.
Recognise many aspects of engineering in the business and industrial environment.
Possesses appropriate level of inter-personal skills, mechanics and organisation of team working.

D2: Able to communicate effectively: (presentation, IT, written).

D3: Capable of searching, summarising and effectively using information.

D4: Demonstrate appropriate level of numeracy.

Learning outcomes for the award of: DipHE

A1: Competence in many aspects of engineering science (shape, materials properties, loads, deformation).
A2: Knowledge and understanding of engineering design and manufacturing (processes and technology).
A3: Knowledge and understanding of much of the principles, implications and limitations of ICT and of developing technologies in ICT.

A4: Capable of management and organisation of many aspects of the commercial and economic resources for design and manufacturing within the product cycle.
A5: Knowledge and understanding of the basis and effects of commercial risks.

B1: Ability to specify, plan and manage many aspects of motor sports engineering designing and projects (individual and team working).

B2: Competence in designing and manufacturing components for motor sports.

B3: Ability to consider and prioritise relevant factors, including health, safety, environmental issues and risk, in the context of motor sports engineering and the product cycle.

B4: Have the capacity and confidence to independently develop technical proficiencies to solve many aspects motor sports engineering problems.

B5: Able to identify and prioritise factors in the context of motor sports engineering and the product cycle.
B6: Ability to apply analytical design techniques to synthesise components and vehicle systems for motor sports.

C1: Capable of analysis & decomposition associated with engineering design & manufacture.

C2: Synthesis including application of computer aided engineering and technology.

C3: Application and analysis of the limitations and context of engineering principles.

C4: Decomposition, evaluation and solution of problems of increasing complexity.

C5: Recognise many aspects of engineering in the business and industrial environment. Possesses appropriate level of inter-personal skills, mechanics and organisation of team working.

D2: Able to communicate effectively: (presentation, IT, written).

D3: Capable of searching, summarising and effectively using information.

D4: Demonstrate appropriate level of numeracy.

D5: Able to work within a framework of relevant legal requirements.

D6: Demonstrate an appropriate level of professional and ethical conduct.

Learning outcomes for the award of: BEng

A1: Competence in engineering science (shape, materials properties, loads, deformation).
A2: Knowledge and understanding of engineering design and manufacturing (processes and technology).
A3: Knowledge and understanding of much of the principles, implications and limitations of ICT and of developing technologies in ICT.

A4: Capable of management and organisation of all aspects of the commercial and economic resources for design and manufacturing within the product cycle.
A5: Knowledge and understanding of the basis and effects of commercial risks.

B1: Ability to specify, plan and manage all aspects of motor sports engineering designing and projects (individual and team working).

B2: Competence in designing and manufacturing components for motor sports.

B3: Ability to consider and prioritise relevant factors, including health, safety, environmental issues and risk, in the context of motor sports engineering and the product cycle.

B4: Have the capacity and confidence to independently develop technical proficiencies to solve all aspects motor sports engineering problems.

B5: Able to evaluate and prioritise factors in the context of motor sports engineering and the product cycle.
B6: Ability to apply analytical design techniques to synthesise components and vehicle systems for motor sports.

C1: Capable of analysis & decomposition associated with engineering design & manufacture.

C2: Synthesis including application and evaluation of computer aided engineering and technology.

C3: Application and analysis of the limitations and context of engineering principles.

C4: Decomposition, evaluation and solution of problems of increasing complexity.
Recognise many aspects of engineering in the business and industrial environment.
D1: Possesses appropriate level of inter-personal skills, mechanics and organisation of team working.

D2: Able to communicate effectively: (presentation, IT, written).

D3: Capable of searching, summarising and effectively using information.

D4: Demonstrate appropriate level of numeracy.

D5: Able to work within a framework of relevant legal requirements.

D6: Demonstrate an appropriate level of professional and ethical conduct.