

## COURSE SPECIFICATION

Course Aim and Title	MSc Electric Vehicle Engineering
Intermediate Awards Available	PGDip Electric Vehicle Engineering PGCert Electric Vehicle Engineering
Teaching Institution(s)	UEL
Alternative Teaching Institutions (for local arrangements see final section of this specification)	N/A
UEL Academic School	Architecture, Computing and Engineering
UCAS Code	N/A
Professional Body Accreditation	N/A
Relevant QAA Benchmark Statements	Engineering (October 2019)
Additional Versions of this Course	MSc Electric Vehicle Engineering with Industrial Placement  PgDip Electric Vehicle Engineering *  *This version of the course does not include the EG7030 Applied Research and Engineering Practice 1. Students who obtain the necessary credits to be awarded the PgDip may choose to not receive the PgDip but instead move to the MSc route by registering for EG7030.
Date Specification Last Updated	17 December 2022

### Course Aims and Learning Outcomes

This MSc course in Electric Vehicle Engineering aims to produce highly skilled engineers with interests in electric vehicle technologies utilising the latest tools and technologies.

This course is designed to give you the opportunity to:

- Gain a depth of knowledge and understanding of the most up to date practices and theories in electric vehicle engineering.
- Gain advanced theoretical and specialist practical knowledge of progressive and emerging topics in electric vehicles.
- Apply key concepts; such as electric powertrain, energy storage, electric vehicle dynamics, smart sensing and communication systems, simulation techniques.
- Develop imaginative, systematic and innovative skills to take forward the knowledge base in vehicle engineering.

- Deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate conclusions clearly to specialist and non-specialist audiences
- Demonstrate self-direction and originality in solving problems and act autonomously in planning and implementing tasks at a professional level.

What you will learn:

### **Knowledge**

- Essential facts, concepts, theories and principles of emerging technologies in electric vehicle systems, such as electrical powertrains, energy storage, vehicle dynamics, vehicle control and communication systems.
- Knowledge and understanding of contemporary tools, technologies, digital simulation platforms to produce solutions relevant to the domain of vehicle engineering to meet a set of agreed requirements.
- A critical understanding of relevant scientific principles of the specialisation.
- Awareness of new and emerging technologies.
- Appropriate models for solving problems in engineering, and the ability to assess the limitations of particular cases.
- Collection and analysis of research data and using appropriate engineering tools to tackle unfamiliar problems, such as those with uncertain or incomplete data.

### **Thinking skills**

- Application of original thought to the development of practical solutions for systems, components, processes or products.
- Demonstration of innovative independent thinking, critical investigation, and analytical skills in the real-world problems related to electric vehicle systems.
- Development of a thorough understanding of current practice and its limitations, and some appreciation of likely new developments.
- How to make critical evaluations of risks through understanding of the basis of such risks.

### **Subject-Based Practical skills**

- How to carry out a research project
- Interpretation of experimental and analysis data
- Use of various computer simulation tools and design packages to analyse and develop appropriate models
- How to conduct design projects and develop appropriate conceptual schemes
- Application of engineering techniques, taking account of a range of commercial and industrial constraints.

### **Skills for life and work (general skills)**

- How to structure and communicate ideas effectively, both orally and in writing.

- Working professionally as an individual and as a team player to develop creative solutions to problems.
- Interpersonal skills, contributing to and working effectively in a team
- How to exercise initiative and personal responsibility, which may be as a team member or leader.

## Learning and Teaching

Knowledge is developed through

- Lectures
- Tutorials
- Seminars
- Site visits

Thinking skills are developed through

- Coursework
- Mini projects
- Research dissertation

Practical skills are developed through

- Laboratory experiments
- Design projects
- Planning of work required for the research dissertation
- Industrial placements, as appropriate
- Research skills-based activities with feedback

Skills for life and work (general skills) are developed through

- Seminars
- Coursework
- Presentation of research
- Research dissertation

In addition, the industrial placement will provide opportunities to apply key technical knowledge and skills learnt in the taught modules, enhance your communication and interpersonal skills and improving your employment potential.

## Assessment

Knowledge is assessed by

- Coursework
- Examinations
- Research dissertation

Thinking skills are assessed by

- Solutions to practical problems
- Evaluation of literature
- Evaluation of experimental data
- Use of appropriate problem-solving skills

Practical skills are assessed by

- Use of design aids
- Use of computer aided design and simulation packages
- Laboratory experiments
- Preparation of research dissertation

Skills for life and work (general skills) are assessed by

- Seminars
- Design drawings, simulations
- Research dissertation
- Oral examinations

Students with disabilities and/or particular learning needs should discuss assessments with the Course Leader to ensure they are able to fully engage with all assessment within the course.

## Work or Study Placements

Students on the placement version of the course will undertake a placement within a partner organisation (or by means of alternative arrangements such as projects led by industry and carried out on campus) to complete a 120 P-credit Industrial Placement Module. The module is graded at either Pass or Fail, assessed by the partner industrial organisation and the University and grades reflected on the students' academic transcripts.

The industrial placement component is for a duration of an academic year, ie, normally 30 weeks including minimum 24 weeks of delivery time. It starts after students have completed the 1st year of study, ie, all the taught modules and the dissertation component of the MSc course which together form 180 credits.

Students on the two-year MSc with placement courses must pass all taught modules of their respective course plus dissertation, ie, 180 credits, before they become eligible to progress to the next stage and undertake industrial placement.

Students on the MSc course with placement will also normally be required to fulfil the 80% attendance requirement (on all modules) to be eligible to progress to the industrial placement module.

Students unable to meet the above requirements and progress successfully will normally be moved to the one-year full-time version of the course and their student visa, if any, will be curtailed accordingly.

The structure of the extended version of the MSc courses that includes the industrial placement is summarised in the following table:

Intake point	Sep	Jan	May	Sep	Jan	May	Sep
September	A, B	C, D	E*	P			
Jan		C, D	Holidays	A, B	E*	P	
May			C, D	A, B	E*	P	

A, B, C and D = 30 credits module

E = 60 credits dissertation

P = 120 credits placement

\* = End of July is deadline for confirming placement

\* = End of March is deadline for confirming placement

Students must check the Academic Calendar for start and end of term dates.

It is ultimately the student's responsibility to secure their placement. The University and the School will offer guidance and support; and recommend students to our industrial partners who are interested in participating in the course. But the onus to find and secure the placement is on the students. If they are unable to secure a placement at the end of taught modules, they will be transferred back to the full time taught course without the placement component and the student visa, if applicable, will be curtailed accordingly by UKVI.

Students undertaking the Placement Module will also normally need to meet the following requirements:

- 80% attendance at the 12 week employability module workshops and classes.
- Registration on the UEL Employment Hub with CV and Covering Letter uploaded.
- Details of placement provided to the Placement Officer by 31<sup>st</sup> July (Sept starters) and 31<sup>st</sup> March (January starters).
- Placement Agreement form signed by the student and partner organisation at least 3 weeks before the placement start date.

## Course Structure

All courses are credit-rated to help you to understand the amount and level of study that is needed.

One credit is equal to 10 hours of directed study time (this includes everything you do e.g. lecture, seminar and private study).

Credits are assigned to one of 5 levels:

- 3 Equivalent in standard to GCE 'A' level and is intended to prepare students for year one of an undergraduate degree course.
- 4 Equivalent in standard to the first year of a full-time undergraduate degree course.
- 5 Equivalent in standard to the second year of a full-time undergraduate degree course.
- 6 Equivalent in standard to the third year of a full-time undergraduate degree course.
- 7 Equivalent in standard to a Masters degree.

Courses are made up of modules that are each credit weighted.

The module structure of this course:

<b>Level</b>	<b>Module Code</b>	<b>Module Title</b>	<b>Credit Weighting</b>	<b>Core/Option</b>	<b>Available by Distance Learning? Y/N</b>
7	EG7030	Applied Research and Engineering Practice 1	60	Core*	N
7	EG7031	Intelligent Transport Systems (ITS)	30	Core	N
7	EG7060	Mental Wealth: Professional Life	30	Core	N
7	EG7164	Automation & Robotics	30	Optional	N
7	EG7025	Thermo-mechanical Energy Conversion	30	Optional	N
7	EG7023	Electrical Automotive Engineering Practice	30	Core	N

7	EG7021	Industrial Placement (for industrial placement course only)	120P	Core for MSc with Industrial Placement	N
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*Please note: Optional modules might not run every year, the course team will decide on an annual basis which options will be running, based on student demand and academic factors, in order to create the best learning experience.*

Additional detail about the course module structure:

\*Applied Research module is not available for PGDip course.

A core module for a course is a module which a student must have passed (i.e. been awarded credit) in order to achieve the relevant named award. An optional module for a course is a module selected from a range of modules available on the course.

The overall credit-rating of the Masters course (not including the industrial placement) is 180 credits. For PGDip courses, it is 120 credits. If for some reason you are unable to achieve this credit you may be entitled to an intermediate award, the level of the award will depend on the amount of credit you have accumulated. You can read the University Student Policies and Regulations on the UEL website.

## Course Specific Regulations

NA

## Typical Duration

For those not on a student visa, it is possible to move from full-time to part-time study and vice-versa to accommodate any external factors such as financial constraints or domestic commitments. Many of our students make use of this flexibility and this may impact on the overall duration of their study period.

### **Course without industrial placement**

The duration of this course is one calendar year full-time if enrolment is in September, and two calendar years part-time. For January enrolment, the duration becomes 15 months full time, and 27 months part-time.

### **Course with industrial placement**

The course with industrial placement is offered in full-time mode only. The duration of this course is two academic years (including the industrial placement element). See "Work or Study Placements" section for more detail.

The time limit for completion of a course is four years after first enrolment on the course.

## Further Information

More information about this course is available from:

- The UEL web site ([www.uel.ac.uk](http://www.uel.ac.uk))
- The course handbook
- Module study guides
- UEL Manual of General Regulations (available on the UEL website)
- UEL Quality Manual (available on the UEL website)
- School web pages
- The Employability HUB

All UEL courses are subject to thorough course approval procedures before we allow them to commence. We also constantly monitor, review and enhance our courses by listening to student and employer views and the views of external examiners and advisors.

Additional costs:

Required:

- Students should have steel toe-capped footwear when attending workshops or laboratories (approximately £50 upwards).

Recommended:

- Students are encouraged to have access to their own personal computing equipment (approximately £300 upwards) and reliable internet connection (price varies) for working off-campus.

Optional:

- There may be optional site visits / trips during the course. Students attending trips will be expected to pay towards travel and/or accommodation and/or subsistence costs and may be required to purchase personal protective equipment. Prices vary depending on the site visits / trips but any details will be advertised to students as soon as they become available.

## Alternative Locations of Delivery

N/A