Course Handbook

BEng(Hons) Electronic Engineering
MEng(Hons) Electronic Engineering

2018-2019

Dr Stephen Sigurnjak
School of Engineering

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

Contents

1. Welcome to the course

Welcome to Electronic Engineering at UCLan. We hope to provide you with an interesting and challenging education, and to develop competences appropriate to Electronic Engineering.

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. Feel free to discuss any aspects with myself or any member of the course team.

Enjoy your time studying with us!

Stephen Sigurnjak – Course Leader for MEng/BEng(Hons) Electronics Engineering

1.1 Rationale, aims and learning outcomes of the course

The MEng/BEng (Hons) Electronic Engineering course aim is to develop graduates with a broad understanding of current technology and practice in electronic engineering, covering the relevant aspects of analogue and digital electronic systems and additional specialist areas according to the option modules studied.

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 (Hons) EE with Industrial Placement.

- To provide a focused education at an academic level appropriate for the target awards: MEng/BEng(Hons) Electronic Engineering & MEng/BEng(Hons) Electronic Engineering with Placement, as well as the exit awards
- To meet the requirements for accreditation of the programme by the Institution of Engineering and Technology (IET).
- To provide an extended, enhanced, and industrially relevant Integrated Master's programme of study in preparation for professional practice. (MEng only)
- To produce resourceful, competent, clear-thinking professional engineers with a range of skills and experience relevant to today's engineering industry.
- To equip graduates of the programme with knowledge, skills, experience, and understanding which underpin a professional career in engineering.

Specifically, the Electronic Engineering courses aim to provide graduates with a broad understanding of current technology and practice in electronic engineering, covering the relevant aspects of analogue and digital electronic engineering, plus additional specialist areas according to the option modules studied.

The discipline of electronic engineering encompasses a wide skills base and the emphasis of this course is placed on electronic system design rather than that of individual component devices. By concentrating on the principles fundamental to system level design, the course equips graduates with the knowledge, skills and confidence to thrive in the rapidly evolving field of electronic engineering, produce designs suitable for a variety of applications and the transferrable skills to find employment in a diverse set of industrial and commercial sectors.

The full program specifications, including learning outcomes, are provided as appendices.

1.2 Course Team

Names and contact details of the key members of the team.

Academic Lead for Engineering
Martin Varley
Computing & Technology Building, room CM149

☎ 01772 893272 (ext. 3272), ✉ mrvarley@uclan.ac.uk

Electronics Engineering Programme Course Leader
Stephen Sigurnjak
Computing & Technology Building, room CM132

☎ 01772 893305 (ext. 3305), ✉ ssigurnjak@uclan.ac.uk

Retention Co-ordinator
Patrick Ryan
Computing & Technology Building, room CM024

☎ 01772 893273 (ext. 3273), ✉ pryan1@uclan.ac.uk

Industrial Placements Tutor
Joel Allison
Computing & Technology Building, room CM131

☎ 01772 893251 (ext.3251), ✉ jallison@uclan.ac.uk

ERE Joint Course Leader (China)
Wei Quan
Computing & Technology Building, room CM124

☎ 01772 895168 (ext. 5168), ✉ wquan@uclan.ac.uk

ERE Projects Co-ordinator (undergraduate)
Javad Yazdani
Computing & Technology Building, room CM138

☎ 01772 892685 (ext. 2685), ✉ jyazdani@uclan.ac.uk

1.3 Expertise of staff

Each member of staff that will be teaching you has had many years' experience of the subject, this may have been gathered via research and scholarly activities or by experience in industry. Many members of staff are actively involved in research and enterprise activities which enrich the curriculum that you will be studying.

1.4 Academic Advisor

You will be assigned an Academic Advisor who will provide additional academic 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, including developing skills in self-awareness, reflection and action planning.

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.

1.7 External Examiner

The External Examiners for the ERE courses are:

Dr Osman Tokhi
Department of Automatic Control and Systems Engineering, University of Sheffield

Dr Maysam Abbod
Senior Lecturer in Intelligent Systems/Course Director for EEE programmes, Department of Electronic and Computer Engineering, Brunel University

External Examiner reports for the Engineering courses can be accessed electronically via the Engineering@UCLan Blackboard pages.

2. Structure of the course

2.1 Overall structure

Figures 1 and 2 overleaf illustrate the programme structure for BEng (Hons) and MEng (Hons) Electronic Engineering courses respectively. These courses exist as part of the Modular Credit Accumulation and Transfer Scheme (MODCATS). The award requires that a student pass 360 credits total for BEng (Hons), or 480 credits for MEng (Hons).

Each full-time year of study requires you to pass modules to the value of 120 credits. Most modules on the programmes are standard sized and worth 20 credits, although there are examples of modules worth 10, 30 and 40 credits. Students wishing to follow part time study are counselled by a member of staff and a suitable programme of study developed. There is also a foundation year entry route and details of that year can be found in the appendix.

Specific credit requirements for the target awards:

MEng (Hons) Electronic Engineering requires 480 credits with a minimum of 360 at level 5 or above, 200 at level 6 or above, 100 at level 7 and a minimum of 360 credits studied at this University.

MEng (Hons) Electronic Engineering with Industrial Placement requires 480 credits with a minimum of 360 at level 5 or above, 200 at level 6 or above, 100 at level 7 and a minimum of 360 credits studied at this University, plus satisfactory completion of the Placement module MP2899.

BEng (Hons) Electronic Engineering requires 360 credits including a minimum of 220 at level 5 or above and a minimum of 100 at level 6.

BEng (Hons) Electronic Engineering with Industrial Placement requires 360 credits including a minimum of 220 at level 5 or above and a minimum of 100 at level 6, plus satisfactory completion of the Placement module MP2899.

Figure 1 BEng EE Programme Structure

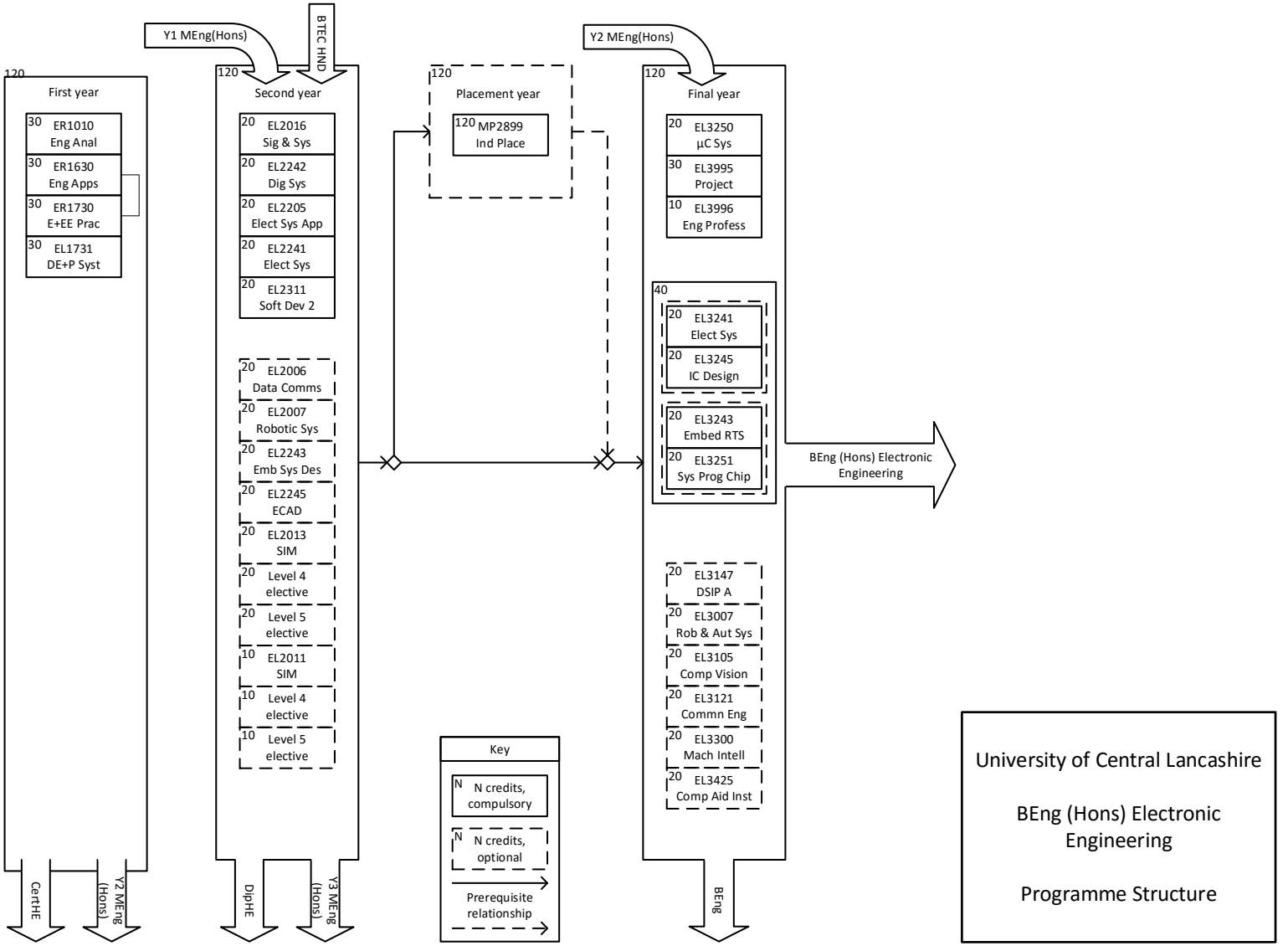


Figure 2 MEng EE Programme Structure

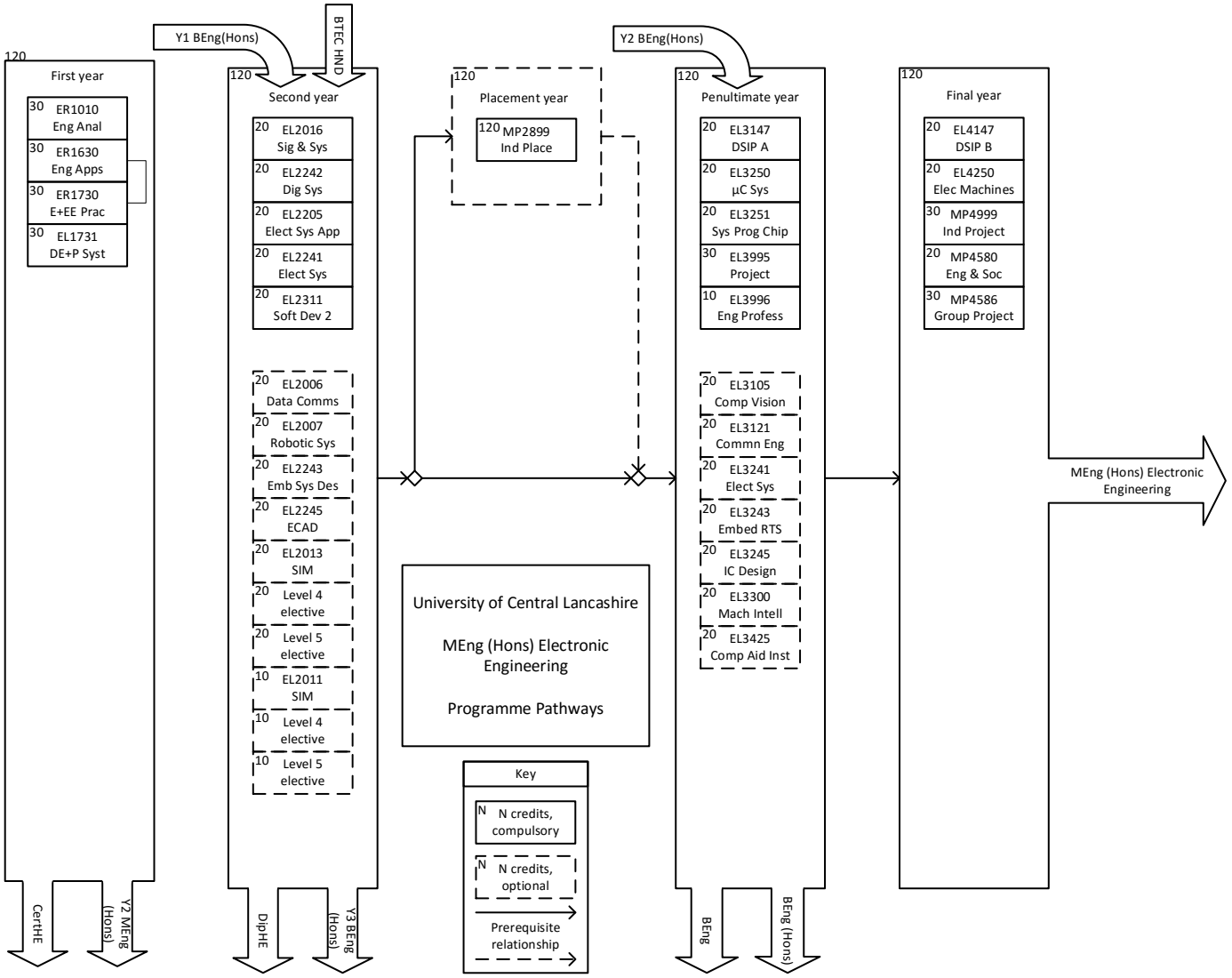


Figure 3 MEng EE Programme Structure

Specific credit requirements for the exit awards:

BEng Electronic Engineering requires 320 credits including a minimum of 180 at level 5 or above and a minimum of 40 at level 6.

Diploma of Higher Education in Electronic Engineering requires 240 credits including a minimum of 100 at Level 5 or above

Certificate of Higher Education in Electronic Engineering requires 120 credits including a minimum of 100 at Level 4 or above.

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.

The modules that you will be studying in your course are detailed below

Level 4 – Stage 1			
Module Code	**Module Title**	**Description**	**Credits**
ER1010	Engineering Analysis		30
ER1630	Engineering Applications		30
ER1730	Electronics and Electronic Engineering Practice		30
ER1731	Digital Electronics and Programmable Systems		30

Level 5 – Stage 2.1 (BEng), Stage 2 (MEng)			
Module Code	**Module Title**	**Description**	**Credits**
EL2106	Signals & Systems	Theoretical underpinnings of continuous & discrete time signal analysis	20
EL2241	Electronic Systems	Circuit analysis & design with emphasis on processing and conversion of analogue signals.	20
EL2242	Digital Systems	Develop digital system design skills, in dedicated hardware and microcontroller based systems.	20
EL2205	Electronic Systems Applications	Develop and apply skills in managing execution of small & group project work, in context of electronic system design.	20
EL2311	Software Development 2	Application of high-level and object orientated tools & techniques in engineering.	20
EL2006	Data Communications	Underlying principles of digital communications networks.	20
EL2007	Robotic Systems	Introduction to robotic systems; sensors, actuation and control.	20
EL2243	Embedded System Design	Develop an awareness of the embedded system design cycle.	20

Level 6 – Stage 2.2 (BEng), Stage 3.1 (MEng)			
Module Code	**Module Title**	**Description**	**Credits**
EL3250	Microcontroller Systems	Design and implement a microcontroller system through the acquisition of skills in embedded software development and hardware interfacing.	20
EL3995	Project	Undertake an individual project, meeting an engineering requirement, integrating relevant technical knowledge & skills	30

EL3996	Engineering Professionalism	Appreciation of the social and environmental aspects of a career in engineering.	10
EL3243	Embedded Real Time Systems	Real-time & concurrent systems methodology. Theory & practice for design & use of embedded real-time systems.	20
EL3251	System on Programmable Chip	Methods for specifying, designing and deploying a digital system on programmable integrated circuits (e.g. an FPGA).	20
EL3147	Digital Signal & Image Processing A	Fundamental topics in the fields of DSP & DIP: acquisition, representation & analysis methods for signals & images, digital filter design, image manipulation & enhancement.	20
EL3007	Robotics & Autonomous Systems	Concepts, theories and technologies required to build the next generation of Intelligent Robotic Systems.	20
EL3121	Communication Engineering	Analysis & design skills, for modern electronic communication systems.	20
EL3105	Computer Vision	Theoretical basis of modern computer vision. Analytical and practical skills to design build and use computer vision systems.	20
EL3300	Machine Intelligence	Fundamental topics in the fields of machine intelligence and machine learning.	20
EL3425	Computer Aided Instrumentation	Specify, select, apply and develop microcomputer-based systems for data acquisition and to control test equipment.	20

Level 7 – Stage 3.2 (MEng)			
Module Code	**Module Title**	**Description**	**Credits**
EL4250	Electrical Machines	Power electronics and systems to control electrical machines	20
EL4147	Digital Signal & Image Processing B	Extended coverage of DSP & DIP topics: Signal and image analysis, compression, enhancement & segmentation, practical implementation considerations	20
MP4580	The Engineer and Society (C)	Experience the methods and processes to maintain product integrity within engineering design and the product cycle	20
MP4586	Group Project	Group work within the Product Cycle, an integral part of being an engineer. Finding optimum design and manufacture for a real application.	30
MP4999	Project (C)	The MEng version of the final year project.	30

2.3 Course requirements

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.

The prescribed modules for the first year of the Electronics Engineering and Robotics Engineering undergraduate courses are identical, thereby enabling students to change their course after the first year. Changes would also be possible following the second year, but these would be more restricted and dependent on the particular modules studied.

If you do not feel capable of completing your chosen course of study then advice may be given on alternative routes or exit awards. However, it is not usually prudent to make decisions about this until results are known in June. Most likely you will be advised to finish all your modules to the best of your abilities and to seek advice once results are available.

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.

BEng to MEng Transfer: All students wishing to transfer from the BEng to the MEng degree 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 Transfer: Transfer from MEng to BEng might be made for a number of reasons including extenuating circumstances or poor academic performance. 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 applying for transfers from other Universities are required to complete the accreditation of certificated prior learning (ACPL). The UCLan regulations do not allow APL of more than ⅔ of the modules required for an award. The latest entry point for external applicants transferring into the courses is the second year. All applicants transferring into the BEng and MEng courses must have accredited prior certified learning.

2.4 Study Time

2.4.1 Weekly timetable

Timetables are accessible online through the following link, please note check your timetable regularly

https://www.uclan.ac.uk/students/study/timetabling.php

2.4.2 Expected hours of study

20 credits is a standard module size and equals 200 notional learning hours. For a typical module you may have a 2 hour lecture, and a 1 hour tutorial/laboratory session, leaving you approximately 3 hours for self-directed study (further reading, tutorial questions, assignments, revision). This is thinking time – not coffee and biscuits time! Often you will be working in groups for practical work and you should try and arrange to meet up outside the scheduled class times. You will also need to use equipment such as computer and laboratory facilities for practical work, again sometimes outside the scheduled class times.

Explain to your students the hours of commitment required in a typical working week for both attendance and personal study, you may also need to incorporate reference to work based or placement learning requirements where relevant.

2.4.3 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:

Martin Varley (Academic Lead for Engineering):

☎ +44 1772 893272 | ✉ mrvarley@uclan.ac.uk

Absences due to illness must be reported to the Computing and Technology student hub:

Computing and Technology Hub:

☎ +44 1772 891994 | ✉ candthub@uclan.ac.uk

You are encouraged to seek the advice of your Personal Tutor and/or Course Leader if your personal circumstances make it difficult to meet your study obligations

3. Approaches to teaching and learning

3.1 Learning and teaching methods

The electronics and robotics engineering programmes use a number of different assessment techniques that will allow you to demonstrate your understanding of concepts and issues covered. These may be broadly categorised as ‘examination’ and ‘coursework’, but several different types are used, e.g. open-book exams, closed-book exams, laboratory reports, practical assessments in the laboratory, computer simulation and analysis, written reports etc.

Evidence of achievement, upon which assessment will be based, will be gained through a programme of practical exercises, assignments and exams. Each week you may be involved in some practical work such as a laboratory exercise, a computer-based assignment, group or individual project work etc. You will often work in groups and make group presentations but you will write up and submit work individually so that you gain credit for your contribution, not that of somebody else.

It should be emphasised that the purpose of assessment is to not only grade you, and provide information to facilitate management of the course, but also to provide feedback to you. In this way you can monitor your own progress, refine your own judgement of your abilities and regulate it accordingly.

You should keep all the returned work in a file and you may have to submit this at the end of the year for the external examiners to assess.

Individual module leaders will distribute information on the methods of assessment used, and their weighting, at the start of each module.

3.2 Study skills

The university offers a number of services to aid you in your studies, this is detailed on the following webpage:

https://www.uclan.ac.uk/students/study/study_support.php

You are also encouraged to discuss any issues that you may have with your academic advisor.

3.3 Learning resources

3.3.1 Learning Information Services (LIS)

Generic information is available in the student handbook on the services that LIS offer. In addition the School of Engineering has a specific webpage maintained by our subject librarian, this can be found at the following link:

http://www.uclan.ac.uk/students/study/library/Engineering_guide.php

3.3.2 Electronic Resources

Most of your modules will have a Blackboard eLearn site associated with it for distribution of learning material. This may include lecture notes, additional reading, web links, tutorial exercises, past exam papers and so forth.

More general information such as Programme Specifications, External Examiner's reports and information about the Industrial Placements can be found on the Engineering blackboard pages

You can access Blackboard online through the Student Portal, please ensure that you have access to this.

3.4 Personal development planning

Personal development planning (PDP) is a reflection on learning, performance and achievement and allows you to plan for personal, educational and career development. As learning is a lifelong process the work in the PDP is not assessed. There are many similarities with work based learning and Continued Professional Development (CPD) –

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

Academic Advisers provide help for students with problems and are responsible for overseeing the progress of students, their welfare, academic counselling and guidance. Your Academic Adviser is allocated when you enrol. You must see your Academic Adviser when requested and meet at least once per semester. Ensure they know you and have your current email address.

Please seek help relating to lecture material and practical classes from the module tutor in the first instance. If necessary make an appointment to seek additional support. Please remember that academic staff are busy people and may not be able to give you instant help.

Although Academic Advisers and Course Leaders will deal with most of the day-to- day questions which arise, the Head of School is always willing to see students and an appointment can be made through the Student Hub. Advice relating to administrative issues may be obtained from the Student Hub.

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. With your agreement information will be passed on to the Disability Advisory

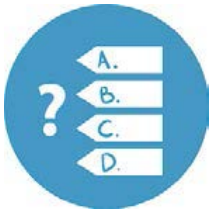
Service. The University will make reasonable adjustments to accommodate your needs and to provide appropriate support for you to complete your study successfully. Where necessary, you will be asked for evidence to help identify appropriate adjustments.

The School of Engineering Disability Tutor is: Dr J. Yazdani, Email: JYazdani@uclan.ac.uk

4.3 Students' Union One Stop Shop

The Opportunities Centre is the Union's One Stop Shop to find employment or volunteering whilst you study. With thousands of jobs and voluntary positions advertised, agency work through the Bridge and information on over 2000 volunteer positions within the Union.

5. Assessment



5.1 Assessment Strategy

The assessment strategy for each module will be outlined within the module. The modules will be assessed either as coursework or by a combination of coursework and examinations with the weightings reflecting the course content (theory/practical). Each of the assessments that you complete will assess a series of learning outcomes defined in the modules. Note that within some modules you may complete assessments that do not carry marks, these are termed formative and are an opportunity for you to gain feedback on your progress that will help you in your summative (mark carrying) assessments.

5.2 Notification of assignments and examination arrangements

This information will be provided within the module session and on blackboard, for examinations you will be informed on your timetable

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.

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.

7. Student Feedback

You can play an important part in the process of improving the quality of this course through the feedback you give.

In addition to the on-going discussion with the course team throughout the year, there are a range of mechanisms for you to feedback about your experience of teaching and learning. We aim to respond to your feedback and let you know of our plans for improvement.

The Students Union can support you in voicing your opinion, provide on-going advice and support, and encourage your involvement in all feedback opportunities. They will be requesting that you complete the National Student Survey (during semester 2 for students in their final year of study) or the UCLan Student Survey (all other students).

The Students' Union and University work closely together to ensure that the student voice is heard in all matters of student-life. We encourage students to provide constructive feedback throughout their time at university, through course reps, surveys and any other appropriate means.

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.

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
3. University School/Centre	School of Engineering
4. External Accreditation	Institution of Engineering and Technology Accreditation to be sought following graduation of first cohort (2016)
5. Title of Final Award	MEng (Hons) Electronic Engineering MEng (Hons) Electronic Engineering with Placement
6. Modes of Attendance offered	Full Time; Part Time; Sandwich
7. UCAS Code	H610 Electronic Engineering
8. Relevant Subject Benchmarking Group(s)	QAA Subject Benchmarking Statement: Engineering (2015)
9. Other external influences	Engineering Council UK-SPEC, Accreditation requirements of IET, QAA Academic Infrastructure Codes of Practice, Science, Technology, Engineering and Mathematics (STEM) government initiatives.
10. Date of production/revision of this form	June 2017

11. Aims of the Programme

- To provide a focused education at an academic level appropriate for:
  (i) The target awards:
    - MEng (Hons) Electronic Engineering
    - MEng (Hons) Electronic Engineering with Placement

  (ii) The exit awards:
    - BEng (Hons) Electronic Engineering
    - BEng (Hons) Electronic Engineering with Placement
    - BEng Electronic Engineering
    - BEng Electronic Engineering with Placement
    - Diploma of Higher Education
    - Certificate of Higher Education

- To meet the requirements for accreditation of the programme by the Institution of Engineering and Technology.

- To provide an extended, enhanced, and industrially relevant Integrated Master's programme of study in preparation for professional practice.

- To produce resourceful, competent, clear-thinking professional engineers with a range of skills and experience relevant to today's engineering industry.

- To equip graduates of the programme with knowledge, skills, experience, and understanding which underpin a professional career in engineering.

Specifically, the MEng (Hons) Electronic Engineering course aims to provide graduates with a broad understanding of current technology and practice in electronic engineering, covering the relevant aspects of analogue and digital electronic engineering, plus additional specialist areas according to the option modules studied.

The discipline of electronic engineering encompasses a wide skills base and the emphasis of this course is placed on electronic system design rather than that of individual component devices. By concentrating on the principles fundamental to system level design, the course equips graduates with the knowledge, skills and confidence to thrive in the rapidly evolving field of electronic engineering, produce designs suitable for a variety of applications and the transferrable skills to find employment in a diverse set of industrial and commercial sectors.

An optional Industrial Placement Year (Year 3) is available, aimed at providing students with relevant and broadening industrial experience to consolidate their learning at Level 4 and Level 5, inform their academic studies at Levels 6 and 7, and enhance their subsequent early career development.

12. Learning Outcomes, Teaching, Learning and Assessment Methods

UK-SPEC, published by the Engineering Council, is the standard for accredited engineering degrees in the UK. The IET serve as an accrediting institution licensed by the Engineering Council and publish their own interpretation of UK-SPEC.

UK-SPEC presents General Learning Outcomes (GLO) categorised in a form wholly compatible with the UCLan equivalents, alongside a more detailed set of Specific Learning Outcomes (SLO). In the following sections A to D learning outcomes for the programme are grouped according to the standard UCLan format, cross-referenced (in brackets) to the corresponding SLOs from the IET interpretation of UK-SPEC.

A. Knowledge and Understanding

A1 Demonstrate knowledge and understanding of the essential concepts and physical principles of the Electronic Engineering discipline:

(i) applicable to electronic component and circuit design; instrumentation and measurement; signal processing, conditioning and conversion **(US1, P1)**

(ii) applicable to digital and programmable system design, associated methodologies of programming and hardware description languages **(US1, P1)**

A2 Demonstrate knowledge and understanding of mathematics underpinning the Electronic Engineering discipline; system analysis, computational algorithms **(US2)**

A3 Appreciation of the wider commercial and economic context of engineering, applicable business and management techniques, relevant social and legal constraints **(S1, S2, S4)**

A4 Understanding of sustainability issues and ability to produce engineering solutions which promote sustainable development **(S3)**

A5 Comprehensive understanding of the scientific principles behind the Electronic Engineering discipline, the state of the art and technological trends **(US1m)**

A6 Extensive knowledge of the equipment, materials and processes employed in the design and production of analogue and digital electronic systems **(P2m)**

Teaching and Learning Methods

Teaching and learning methods include traditional lectures, tutorials, laboratory work, directed self-study, and project work.

Assessment methods

Written assessment methods include examinations, laboratory-based and research-based assignments, tutorial questions, log books and formal reports.

Oral assessment methods include interviews and presentations

Practical skills are assessed using assignment work, and demonstrations.

B. Subject-specific skills

B1 Ability to apply engineering principles, general physical principles and underlying engineering science to the analysis and solution of engineering problems **(US3, E1)**

B2 Practical application of theory to quantitative models and computer software for the simulation, design and verification of electronic systems and devices. **(E2, E3)**

B3 Manage costs in order to produce system designs which both meet defined requirements and are economically viable **(D3)**

B4 Demonstrate practical competencies in laboratory and workshop skills required for the test, measurement and fabrication of electronic systems and devices **(P1, P2)**

B5 Appreciation of the wider multidisciplinary context within which engineering knowledge is applicable **(P3)**

B6 Understanding of the codes of practice, standards and quality management processes applicable to electronic systems design, adopting these where appropriate to the design process **(P6, P7)**

B7 Comprehensive understanding of quantitative and numerical models for engineering analyses, critical awareness of their limitations **(US3m, E2m)**

Teaching and Learning Methods

Teaching and learning methods include traditional lectures, tutorials, laboratory work, directed self-study, and project work.

Assessment methods

Written assessment methods include examinations, laboratory-based and research-based assignments, tutorial questions, log books and formal reports.

Oral assessment methods include interviews and presentations

Practical skills are assessed using assignment work, and demonstrations.

C. Thinking Skills

C1 Ability to apply systems analysis techniques to the top-level design of electronic systems, and the decomposition and synthesis of sub-systems using appropriate technologies **(E4)**

C2 Ability to define a problem including understanding customer needs **(D1, D2)**

C3 Demonstrate creative and innovative ability in the synthesis of solutions and generation of designs for electronic devices and systems to fulfil new and emerging needs **(D4, D5, D2m)**

C4 Manage design processes and evaluate outcomes **(D6)**

C5 Adopt appropriate ethical and professional standards and practices, demonstrate extensive knowledge of the commercial and economic constraints affecting the exercise of engineering judgement **(S5, S1m, S2m)**

C6 Ability to solve complex and unfamiliar problems through application of a comprehensive understanding of design processes to unfamiliar situations and concepts, demonstrably managing the inherent technical uncertainty **(P8, E3m, D1m)**

C7 Understanding of current practice and its limitations, ability to investigate likely developments and emerging technologies **(US2m, E1m, P1m)**

C8 Comprehension of the commercial multidisciplinary engineering context, ability to apply concepts including these outside influences effectively in engineering projects **(US4m, P3m)**

Teaching and Learning Methods

Teaching and learning methods include traditional lectures, tutorials, laboratory work, directed self-study, and project work.

Assessment methods

Written assessment methods include examinations, laboratory-based and research-based assignments, tutorial questions, log books and formal reports.

Oral assessment methods include interviews and presentations

Practical skills are assessed using assignment work, and demonstrations.

D. Other skills relevant to employability and personal development

D1 Effective exploitation of literature, locate and critically evaluate information from a variety of sources **(P4)**

D2 Communicate in an accurate, persuasive and succinct form, via a variety of media **(GLO)**

D3 Independence, self-awareness, and the intrinsic motivation to develop technical proficiencies and achieve goals without external influence **(GLO)**

D4 Work effectively as part of a team **(GLO)**

D5 Personal development planning, self-directed learning and reflection for future CPD **(GLO)**
Teaching and Learning Methods
Teaching and learning methods include traditional lectures, seminars, directed study, demonstrations, guided practical sessions, workshops and project work.
Assessment methods
Written assessment methods include laboratory-based and research-based assignments, independent dissertation, log books and formal reports. Oral assessment methods include presentations, interviews and viva-voce examinations. Teamwork skills are assessed using assignment work contributions, peer assessment and staff observation.

13. Programme Structures*				**14. Awards and Credits***
Level	**Module Code**	**Module Title**	**Credit rating**	
Level 7		**Compulsory Modules:**		**MEng (Hons)**
	EL4250	Power Electronics and Electrical Machine Control	20	**Electronic Engineering**
	EL4147	Digital Signal & Image Processing B	20	Requires 480 credits with 120 at Stage 2 and 240 at Stage 3, including a minimum of 460 at Level 4 or above, 360 at Level 5 or above, 200 at Level 6 or above and 120 at Level 7. The Project modules MP4586 and MP4999 cannot be compensated.
	MP4580	The Engineer & Society	20	
	MP4586	Group Project	30	
	MP4999	Individual Project	30	
Level 6		**Compulsory Modules:**		**BEng (Hons)**
	EL3147	Digital Signal & Image Processing A	20	**Electronic Engineering**
	EL3250	Microcontroller Systems	20	Requires 360 credits including a minimum of 220 at Level 5 or above and 100 at Level 6, including the Project. The Project module EL3995 cannot be compensated.
	EL3251	System on Programmable Chip	20	
	EL3995	Project	30	
	EL3996	Engineering Professionalism	10	
		Option Modules:		**BEng**
	EL3105	Computer Vision	20	**Electronic Engineering**
	EL3121	Communication Engineering	20	Requires 320 credits with a minimum of 180 at Stage 2, including Level 5 or above, and 40 at Level 6. The Project module EL3995 cannot be compensated.
	EL3241	Operational Amplifier Systems	20	
	EL3243	Embedded Real-Time Systems	20	
	EL3245	IC Design	20	
	EL3300	Machine Intelligence	20	
	EL3425	Computer Aided Instrumentation	20	
Level 5		**Industrial placement:** (required for sandwich award)		Satisfactory completion of the Industrial Placement leads to a degree **'with Industrial Placement'**.
	MP2899	Industrial Placement (6 modules)	120	**CertHE** and **DipHE** are not available as sandwich awards.
Level 5		**Compulsory Modules:**		**Diploma of Higher Education (in Electronic Engineering)**
	EL2106	Signals & Systems	20	Requires 240 credits including a minimum of 220 credits at Level 4 or above and 100 credits at Level 5 or above.
	EL2205	Electronic System Applications	20	
	EL2241	Electronic Systems	20	
	EL2242	Digital Systems	20	
	EL2311	Software Development 2	20	
		Option Modules:		
	EL2006	Data Communications	20	
	EL2007	Robotic Systems	20	
	EL2243	Embedded System Design	20	
	EL2245	ECAD	20	
	EL2011	Student Initiated Credit	10	
	EL2013	Student Initiated Credit	20	
	Elective	(Level 4 or above)	20	
Level 4		**Compulsory Modules:**		**Certificate of Higher Education (in Electronic Engineering)**
	ER1010	Engineering Analysis	30	Requires 120 credits at Level 4 or above.
	ER1630	Engineering Applications	30	
	ER1730	Electronics and Electronic Engineering Practice	30	
	ER1731	Digital Electronics and Programmable Systems	30	

15. Personal Development Planning

Various PDP-related issues are presented and discussed throughout the course, including specific sessions on aspects such as time management, preparation for assessments, review and reflection, postgraduate opportunities, etc. PDP guidance specifically for these ERE courses is provided, with relevant issues being discussed in several of the modules, most notably the practical-based modules ER1630, ER1730, EL2205 and the project modules at Levels 6 and 7.

The use of an effective Personal Tutor / Academic Advisor system, with a named lecturer responsible for each of the Year 1 and Year 2, is helpful in this respect. Issues related to the Industrial Placement year (year 3) are discussed in sessions (MP2899), held during the second year of study, and during placement visits for students on Industrial Placement. Final Year students' Personal Tutor is their individual Project Supervisor, who they will meet regularly throughout the year. There is also a named Final Year Tutor who deals with issues specific to the final year.

The University also has central PDP guidance and support, and reference to this is made in the Student Handbook.

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.*

The University's minimum standard entry requirement for degree-level study is a 12-unit profile, made up from one of the following:

- At least two A2-level subjects
- One A2-level subject plus one single award Advanced VCE
- One double or two single award(s) Advanced VCE

Other acceptable qualifications include:

- Scottish Certificate of Education Higher Grade
- Irish Leaving Certificate Higher Grade
- International Baccalaureate
- BTEC National Certificate/Diploma
- Access to HE Diploma

Applicants should be aware that the points or grade requirements for many courses must be met by A2 level qualifications. Please note, in some cases A/S points will not be taken into consideration.

Applications from individuals with non-standard qualifications or relevant work / life experience who can demonstrate the ability to cope with and benefit from degree-level studies are welcome. If you have not studied recently you may need to undertake a Foundation Entry programme first. For details of those offered by the University please contact Enquiry Management on 01772 892400.

Specific entry requirements for MEng (Hons) Electronic Engineering are 320 points including Mathematics and either Electronics or Physics at A2 level, BTEC National Diploma in Engineering or Science (should include relevant Maths modules) with grade DMM; plus at least five GCSEs at grade C or above including Maths and English. Other equivalent qualifications, including Kite Marked Access Courses, are accepted.

17. Key sources of information about the programme

School and course webpages:
http://www.uclan.ac.uk/schools/engineering/index.php
http://www.uclan.ac.uk/information/courses/meng_electronics.php

- **Factsheet for Electronic Engineering courses**
- **UCAS information**
- **External Influences:**
  http://www.theiet.org/academics/accreditation/policy-guidance/synopsis_handbook.cfm
  http://www.engc.org.uk/professional-qualifications/standards/uk-spec
  http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/Engineering10.pdf

18. Curriculum Skills Map (Part A: Levels 6 & 7)

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 & Understanding						Subject-specific skills							Thinking skills									Other skills relevant to employment and personal development				
				A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	C5	C6	C7	C8	D1	D2	D3	D4	D5
LEVEL 7	EL4250	Power Electronics & Electrical Machine Control	COMP		X						X					X			X			X	X	X		X			
	EL4147	DSIP B	COMP	X	X					X	X		X	X		X				X		X				X			
	MP4580	The Engineer & Society	COMP													X					X	X	X			X			X
	MP4586	Group Project	C					X	X							X					X	X	X	X		X		X	X
	MP4999	Individual Project	C					X	X												X	X	X			X	X		X
LEVEL 6	EL3102	Control Systems	O	X	X			X		X	X		X			X	X								X	X			
	EL3105	Computer Vision	O	X	X					X	X								X	X					X	X			
	EL3121	Communication Engineering	O		X					X	X				X										X	X			
	EL3147	DSIP A	COMP	X	X					X	X		X	X		X	X							X	X	X			
	EL3241	Operational Amplifier Systems	O	X	X					X	X		X				X								X	X			
	EL3243	Embedded Real-Time Systems	O	X	X					X	X		X				X		X	X					X	X			
	EL3245	IC Design	O	X						X	X		X													X			
	EL3250	Microcontroller Systems	COMP							X	X														X	X			
	EL3251	System on Programmable Chip	COMP	X		X				X	X		X				X									X			
	EL3300	Machine Intelligence	O		X					X	X						X				X	X	X	X		X			
	EL3425	Computer Aided Instrument.	O	X						X	X					X	X	X				X			X	X			
	EL3995	Project	C	X		X				X	X	X	X	X	X		X	X	X	X		X			X	X			
	EL3996	Engineering Professionalism	COMP			X	X							X	X						X				X	X	X		X

Note: The Industrial Placement module MP2899 is taken by Sandwich students and leads to an award (Honours Degree or Degree) 'with Industrial Placement'. The specific Learning Outcomes unique to this module, and addressed within it, are:

(1) Apply the basic knowledge and skills acquired during academic study at Level 4 and Level 5 in a professional engineering environment
(2) Contribute independently and confidentially to team and individual engineering projects
(3) Describe the position of engineering as a dimension of business activity

(4) Demonstrate a mature and professional attitude to work

18. Curriculum Skills Map (Part B: levels 4 & 5)

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 & Understanding						Subject-specific skills							Thinking skills								Other skills relevant to employment and personal development				
				A1	A2	A3	A4	A5	A6	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4	C5	C6	C7	C8	D1	D2	D3	D4	D5
LEVEL 5	EL2006	Data Communications	O	✗	✗					✗	✗		✗													✗			✗
	EL2007	Robotic Systems	O	✗	✗					✗	✗		✗	✗	✗		✗		✗						✗	✗			
	EL2106	Signals & Systems	COMP	✗	✗					✗	✗		✗				✗								✗	✗			
	EL2205	Electronic Systems Applications	COMP	✗	✗	✗				✗	✗	✗	✗				✗	✗		✗					✗	✗	✗	✗	
	EL2241	Electronic Systems	COMP	✗	✗					✗	✗		✗												✗	✗			
	EL2242	Digital Systems	COMP							✗	✗		✗													✗			
	EL2243	Embedded System Design	O	✗	✗	✗				✗	✗		✗		✗		✗	✗								✗			
	EL2245	ECAD	O	✗	✗					✗			✗													✗			
	EL2311	Software Development 2	COMP		✗					✗			✗		✗			✗	✗							✗			
	EL2011/3	SIM	O	✗																						✗	✗		
LEVEL 4	ER1010	Engineering Analysis	COMP		X					X											X					X			
	ER1630	Engineering Applications	COMP	X			X			X	X						X								X	X			X
	ER1730	Electronics and Electronic Engineering Practice	COMP	X	X					X	X	X	X					X		X					X	X	X		X
	ER1731	Digital Electronics and Programmable Systems	COMP	X	X					X	X		X				X	X		X					X	X			

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

19. LEARNING OUTCOMES FOR EXIT AWARDS:

For **each exit award available**, list learning outcomes relating to the knowledge and understanding, subject specific skills, thinking, other skills relevant to employability and personal development that a typical student might be expected to gain as a result of successfully completing each level of a course of study.

Learning outcomes for the award of: CertHE Electronic Engineering

- Demonstrate knowledge and understanding of the essential concepts and physical principles of the Electronic Engineering discipline:
  - (i) applicable to electronic component and circuit design; instrumentation and measurement; signal processing, conditioning and conversion
  - (ii) applicable to digital and programmable system design, associated methodologies of programming and hardware description languages
- Demonstrate knowledge and understanding of mathematics underpinning the Electronic Engineering discipline; system analysis, computational algorithms
- Ability to apply engineering principles, general physical principles and underlying engineering science to the analysis and solution of engineering problems
- Practical application of theory to quantitative models and computer software for the simulation, design and verification of electronic systems and devices
- Manage costs in order to produce system designs which both meet defined requirements and are economically viable
- Demonstrate practical competencies in laboratory and workshop skills required for the test, measurement and fabrication of electronic systems and devices
- Ability to define a problem including understanding customer needs
- Manage design processes and evaluate outcomes
- Effective exploitation of literature, locate and critically evaluate information from a variety of sources
- Communicate in an accurate, persuasive and succinct form, via a variety of media
- Personal development planning, self-directed learning and reflection for future CPD

Learning outcomes for the award of: DipHE Electronic Engineering

- Demonstrate knowledge and understanding of the essential concepts and physical principles of the Electronic Engineering discipline:
  - (i) applicable to electronic component and circuit design; instrumentation and measurement; signal processing, conditioning and conversion
  - (ii) applicable to digital and programmable system design, associated methodologies of programming and hardware description languages
- Demonstrate knowledge and understanding of mathematics underpinning the Electronic Engineering discipline; system analysis, computational algorithms
- Appreciation of the wider commercial and economic context of engineering, applicable business and management techniques, relevant social and legal constraints
- Ability to apply engineering principles, general physical principles and underlying engineering science to the analysis and solution of engineering problems
- Practical application of theory to quantitative models and computer software for the simulation, design and verification of electronic systems and devices
- Manage costs in order to produce system designs which both meet defined requirements and are economically viable
- Demonstrate practical competencies in laboratory and workshop skills required for the test, measurement and fabrication of electronic systems and devices
- Ability to apply systems analysis techniques to the top-level design of electronic systems, and the decomposition and synthesis of sub-systems using appropriate technologies
- Ability to define a problem including understanding customer needs
- Manage design processes and evaluate outcomes

Effective exploitation of literature, locate and critically evaluate information from a variety of sources

Communicate in an accurate, persuasive and succinct form, via a variety of media

Work effectively as part of a team

Personal development planning, self-directed learning and reflection for future CPD

Learning outcomes for the award of: BEng Electronic Engineering

Demonstrate knowledge and understanding of the essential concepts and physical principles of the Electronic Engineering discipline:

(i) applicable to electronic component and circuit design; instrumentation and measurement; signal processing, conditioning and conversion

(ii) applicable to digital and programmable system design, associated methodologies of programming and hardware description languages

Demonstrate knowledge and understanding of mathematics underpinning the Electronic Engineering discipline; system analysis, computational algorithms

Appreciation of the wider commercial and economic context of engineering, applicable business and management techniques, relevant social and legal constraints

Ability to apply engineering principles, general physical principles and underlying engineering science to the analysis and solution of engineering problems

Practical application of theory to quantitative models and computer software for the simulation, design and verification of electronic systems and devices

Manage costs in order to produce system designs which both meet defined requirements and are economically viable

Demonstrate practical competencies in laboratory and workshop skills required for the test, measurement and fabrication of electronic systems and devices

Ability to apply systems analysis techniques to the top-level design of electronic systems, and the decomposition and synthesis of sub-systems using appropriate technologies

Ability to define a problem including understanding customer needs

The ability to creatively apply engineering principles to establish innovative solutions and to ensure their fitness for purpose

Effective exploitation of literature, locate and critically evaluate information from a variety of sources

Communicate in an accurate, persuasive and succinct form, via a variety of media

Independence, self-awareness, and the intrinsic motivation to develop technical proficiencies and achieve goals without external influence

Work effectively as part of a team

Personal development planning, self-directed learning and reflection for future CPD

Learning outcomes for the award of: BEng (Hons) Electronic Engineering

Demonstrate knowledge and understanding of the essential concepts and physical principles of the Electronic Engineering discipline:

(i) applicable to electronic component and circuit design; instrumentation and measurement; signal processing, conditioning and conversion

(ii) applicable to digital and programmable system design, associated methodologies of programming and hardware description languages

Demonstrate knowledge and understanding of mathematics underpinning the Electronic Engineering discipline; system analysis, computational algorithms

Appreciation of the wider commercial and economic context of engineering, applicable business and management techniques, relevant social and legal constraints

Understanding of sustainability issues and ability to produce engineering solutions which promote sustainable development

Ability to apply engineering principles, general physical principles and underlying engineering science to the analysis and solution of engineering problems

Practical application of theory to quantitative models and computer software for the simulation, design and verification of electronic systems and devices

Manage costs in order to produce system designs which both meet defined requirements and are economically viable

Demonstrate practical competencies in laboratory and workshop skills required for the test, measurement and fabrication of electronic systems and devices

Appreciation of the wider multidisciplinary context within which engineering knowledge is applicable

Understanding of the codes of practice, standards and quality management processes applicable to electronic systems design, adopting these where appropriate to the design process

Ability to apply systems analysis techniques to the top-level design of electronic systems, and the decomposition & synthesis of sub-systems using appropriate technologies

Ability to define a problem including understanding customer needs

The ability to creatively apply engineering principles to establish innovative solutions and to ensure their fitness for purpose

Manage design processes and evaluate outcomes

Exercise of engineering judgement accounting for professional & ethical responsibilities

Ability to analyse unfamiliar problems, apply unfamiliar concepts and manage the inherent technical uncertainty

Effective exploitation of literature, locate and critically evaluate information from a variety of sources

Communicate in an accurate, persuasive and succinct form, via a variety of media

Independence, self-awareness, and the intrinsic motivation to develop technical proficiencies and achieve goals without external influence

Work effectively as part of a team

Personal development planning, self-directed learning and reflection for future CPD

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

13. Awarding Institution / Body	University of Central Lancashire
14. Teaching Institution and Location of Delivery	University of Central Lancashire Beijing Institute of Technology (Years 1 and 2 only)
15. University School/Centre	School of Engineering
16. External Accreditation	Institution of Engineering and Technology (to 2017 intake) – currently UCLan only
17. Title of Final Award	BEng (Hons) Electronic Engineering BEng (Hons) Electronic Engineering with Placement
18. Modes of Attendance offered	Full Time; Part Time; Sandwich - UClan only
19. UCAS Code	H610 Electronic Engineering
20. Relevant Subject Benchmarking Group(s)	QAA Subject Benchmarking Statement: Engineering (2015)
21. Other external influences	Engineering Council UK-SPEC, Accreditation requirements of IET, QAA Academic Infrastructure Codes of Practice, Science, Technology, Engineering & Mathematics (STEM) government initiatives.
22. Date of production/revision of this form	June 2017

23. Aims of the Programme

- To provide a focused education at an academic level appropriate for:
  (i) The target awards:
    - BEng (Hons) Electronic Engineering
    - BEng (Hons) Electronic Engineering with Placement
  (ii) The exit awards:
    - BEng Electronic Engineering
    - BEng Electronic Engineering with Placement
    - Diploma of Higher Education
    - Certificate of Higher Education

- To meet the requirements for accreditation of the programme by the Institution of Engineering and Technology.

- To produce resourceful, competent, clear-thinking professional engineers with a range of skills and experience relevant to today's engineering industry.

- To equip graduates of the programme with knowledge, skills, experience, and understanding which underpin a professional career in engineering.

Specifically, the BEng (Hons) Electronic Engineering course aims to provide graduates with a broad understanding of current technology and practice in electronic engineering, covering the relevant aspects of analogue and digital electronic engineering, plus additional specialist areas according to the option modules studied.

The discipline of electronic engineering encompasses a wide skills base and the emphasis of this course is placed on electronic system design rather than that of individual component devices. By concentrating on the principles fundamental to system level design, the course equips graduates with the knowledge, skills and confidence to thrive in the rapidly evolving field of electronic engineering, produce designs suitable for a variety of applications and the transferrable skills to find employment in a diverse set of industrial and commercial sectors.

An optional Industrial Placement Year (Year 3) is available, aimed at providing students with relevant and broadening industrial experience to consolidate their learning at Level 4 and Level 5, inform their academic studies at Level 6 and enhance their subsequent early career development.

24. Learning Outcomes, Teaching, Learning and Assessment Methods

UK-SPEC, published by the Engineering Council, is the standard for accredited engineering degrees in the UK. The IET serve as an accrediting institution licensed by the Engineering Council and publish their own interpretation of UK-SPEC.

UK-SPEC presents General Learning Outcomes (GLO) categorised in a form wholly compatible with the UCLan equivalents, alongside a more detailed set of Specific Learning Outcomes (SLO). In the following sections A to D learning outcomes for the programme are grouped according to the standard UCLan format, cross-referenced (in brackets) to the corresponding SLOs from the IET interpretation of UK-SPEC.

A. Knowledge and Understanding

A1 Demonstrate knowledge and understanding of the essential concepts and physical principles of the Electronic Engineering discipline:

(iii) applicable to electronic component and circuit design; instrumentation and measurement; signal processing, conditioning and conversion **(US1, P1)**

(iv) applicable to digital and programmable system design, associated methodologies of programming and hardware description languages **(US1, P1)**

A2 Demonstrate knowledge and understanding of mathematics underpinning the Electronic Engineering discipline; system analysis, computational algorithms **(US2)**

A3 Appreciation of the wider commercial and economic context of engineering, applicable business and management techniques, relevant social and legal constraints **(S1, S2, S4)**

A4 Understanding of sustainability issues and ability to produce engineering solutions which promote sustainable development **(S3)**

Teaching and Learning Methods

Teaching and learning methods include traditional lectures, tutorials, laboratory work, directed self-study, and project work.

Assessment methods

Written assessment methods include examinations, laboratory-based and research-based assignments, tutorial questions, log books and formal reports.

Oral assessment methods include interviews and presentations

Practical skills are assessed using assignment work, and demonstrations.

B. Subject-specific skills

B1 Ability to apply engineering principles, general physical principles and underlying engineering science to the analysis and solution of engineering problems **(US3, E1)**

B2 Practical application of theory to quantitative models and computer software for the simulation, design and verification of electronic systems and devices. **(E2, E3)**

B3 Manage costs in order to produce system designs which both meet defined requirements and are economically viable **(D3)**

B4 Demonstrate practical competencies in laboratory and workshop skills required for the test, measurement and fabrication of electronic systems and devices. **(P1, P2)**

B5 Appreciation of the wider multidisciplinary context within which engineering knowledge is applicable **(P3)**

B6 Understanding of the codes of practice, standards and quality management processes applicable to electronic systems design, adopting these where appropriate to the design process **(P6, P7)**

Teaching and Learning Methods

Teaching and learning methods include traditional lectures, tutorials, laboratory work, directed self-study, and project work.

Assessment methods

Written assessment methods include examinations, laboratory-based and research-based assignments, tutorial questions, log books and formal reports.

Oral assessment methods include interviews and presentations

Practical skills are assessed using assignment work, and demonstrations.

C. Thinking Skills

- **C1** Ability to apply systems analysis techniques to the top-level design of electronic systems, and the decomposition & synthesis of sub-systems using appropriate technologies **(E4)**
- **C2** Ability to define a problem including understanding customer needs **(D1, D2)**
- **C3** The ability to creatively apply engineering principles to establish innovative solutions and to ensure their fitness for purpose **(D4, D5)**
- **C4** Manage design processes and evaluate outcomes **(D6)**
- **C5** Exercise of engineering judgement accounting for professional & ethical responsibilities **(S5)**
- **C6** Ability to analyse unfamiliar problems, apply unfamiliar concepts and manage the inherent technical uncertainty **(P8)**

Teaching and Learning Methods

Teaching and learning methods include traditional lectures, tutorials, laboratory work, directed self-study, and project work.

Assessment methods

Written assessment methods include examinations, laboratory-based and research-based assignments, tutorial questions, log books and formal reports.

Oral assessment methods include interviews and presentations

Practical skills are assessed using assignment work, and demonstrations.

D. Other skills relevant to employability and personal development

- **D1** Effective exploitation of literature, locate and critically evaluate information from a variety of sources **(P4)**
- **D2** Communicate in an accurate, persuasive and succinct form, via a variety of media **(GLO)**
- **D3** Independence, self-awareness, and the intrinsic motivation to develop technical proficiencies and achieve goals without external influence **(GLO)**
- **D4** Work effectively as part of a team **(GLO)**
- **D5** Personal development planning, self-directed learning and reflection for future CPD **(GLO)**

Teaching and Learning Methods

Teaching and learning methods include traditional lectures, tutorials, laboratory work, directed self-study, and project work.

Assessment methods

Written assessment methods include examinations, laboratory-based and research-based assignments, tutorial questions, log books and formal reports.

Oral assessment methods include interviews and presentations

Practical skills are assessed using assignment work, and demonstrations.

13. Programme Structures*				**14. Awards and Credits***
Level	**Module Code**	**Module Title**	**Credit rating**	
Level 6		**Compulsory Modules:**		**BEng (Hons) Electronic Engineering** Requires 360 credits including a minimum of 220 at Level 5 or above, and a minimum of 100 at Level 6, including the Project. The Project module cannot be compensated. **BEng Electronic Engineering** Requires a minimum of 320 credits with 180 at Stage 2, including Level 5 or above, and a minimum of 40 at Level 6. The Project module cannot be compensated.
	EL3250	Microcontroller Systems	20	
	EL3995	Project	30	
	EL3996	Engineering Professionalism	10	
		Plus at least one of:		
	EL3243	Embedded Real-Time Systems	20	
	EL3251	System on Programmable Chip	20	
		Option Modules:	20	
	EL3007	Robotics & Autonomous Systems	20	
	EL3105	Computer Vision		
	EL3121	Communication Engineering		
	EL3147	Digital Signal & Image Processing A	20	
	EL3300	Machine Intelligence	20	
	EL3425	Computer Aided Instrumentation	20	
	EL3241	Operational Amplifier Systems	20	
	EL3245	IC Design	20	
			20	
Level 5		**Industrial placement:** (required for sandwich award)		**Satisfactory completion of the Industrial Placement leads to a degree 'with Industrial Placement'.** CertHE and DipHE are not available as sandwich awards.
	MP2899	Industrial Placement** (6 modules)	120	
Level 5		**Compulsory Modules:**		**Diploma of Higher Education** Requires 240 credits including a minimum of 220 credits at Level 4 or above and at least 100 credits at level 5 or above.
	EL2106	Signals & Systems	20	
	EL2205	Electronic System Applications	20	
	EL2241	Electronic Systems	20	
	EL2242	Digital Systems	20	
	EL2311	Software Development 2	20	
	EF2318	Upper-Intermediate English for Franchised Programmes*	20	
	EL2006	**Option Modules:**		
	EL2007	Data Communications	20	
	EL2243	Robotic Systems**	20	
	EL2245	Embedded System Design**	20	
		ECAD**		
	EL2011	Student Initiated Module	10	
	EL2013	Student Initiated Module	20	
	Elective	(Level 4 or above)**	20	
Level 4		**Compulsory Modules:**		**Certificate of Higher Education** Requires 120 credits at Level 4 or above.
		<u>UCLan Preston</u>		
	ER1010	Engineering Analysis**	30	
	ER1630	Engineering Applications**	30	
	ER1730	Electronics and Electronic Engineering Practice**	30	

	ER1731	Digital Electronics and Programmable Systems**	30	
		<u>BIT</u>		
	EL1205	Electronic Engineering Practice*	20	
	EL1241	Analogue Electronics*	20	
	EL1242	Digital Electronics*	20	
	EL1311	Software Development 1*	20	
	EL1211	Engineering Mathematics*	20	
	EF1218	Intermediate English for Franchised Programmes*	20	

* Available at Beijing Institute of Technology only
** Available at UCLan only

15. Personal Development Planning

Various PDP-related issues are presented and discussed throughout the course, including specific sessions on aspects such as time management, preparation for assessments, review and reflection, postgraduate opportunities, etc. PDP guidance specifically for these ERE courses is provided, with relevant issues being discussed in several of the modules, most notably the practical-based modules ER1630, ER1730, EL1205, EL2205 and the final year project module. The use of an effective Personal Tutor system, with a named lecturer responsible for each of the Year 1 and Year 2, is helpful in this respect. Issues related to the Industrial Placement year (Year 3) are discussed in sessions (MP2899), held during the second year of study, and during placement visits for students on Industrial Placement. Final Year students' Personal Tutor is their individual Project Supervisor, who they will meet regularly throughout the year. There is also a named Final Year Tutor who deals with issues specific to the final year.

The University also has central PDP guidance and support, and reference to this is made in the Student Handbook.

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.*

The University's minimum standard entry requirement for degree-level study is a 12-unit profile, made up from one of the following:

- At least two A2-level subjects
- One A2-level subject plus one single award Advanced VCE
- One double or two single award(s) Advanced VCE

Other acceptable qualifications include:

- Scottish Certificate of Education Higher Grade
- Irish Leaving Certificate Higher Grade
- International Baccalaureate
- BTEC National Certificate/Diploma
- Access to HE Diploma

Applicants should be aware that the points or grade requirements for many courses must be met by A2 level qualifications. Please note, in some cases A/S points will not be taken into consideration.

Applications from individuals with non-standard qualifications or relevant work / life experience who can demonstrate the ability to cope with and benefit from degree-level studies are welcome. If you have not studied recently you may need to undertake a Foundation Entry programme first. For details of those offered by the University please contact Enquiry Management on 01772 892400.

Specific entry requirements for BEng (Hons) Electronic Engineering are 240 points including Mathematics or Science or Technology at A2 level, BTEC National Diploma in Engineering or Science with grade MMM; plus at least five GCSEs at grade C or above including Maths and English. Other equivalent qualifications, including Kite Marked Access Courses, are accepted.

Beijing Institute of Technology

The normal entry requirements for a School of Engineering franchise course in China are:
satisfactory completion of Chinese High School;
and satisfactory completion of the Mathematics and Physics entry tests (in Chinese Language);
and passing UCLan English language ELET test or IELTS equivalent to a minimum of 4.5.

The testing of ELET test for entry into Year 1 in China will be administered and marked by appropriately trained UCLan staff and will follow procedures approved by the Department of Languages and therefore will comply with the requirements recently approved by Academic Standards Committee.

17. Key sources of information about the programme

School and course webpages:
http://www.uclan.ac.uk/schools/engineering/index.php
http://www.uclan.ac.uk/information/courses/beng_electronics.php

- **Factsheet for Electronic Engineering courses**
- **UCAS information**
- **External Influences:**
  http://www.theiet.org/academics/accreditation/policy-guidance/synopsis_handbook.cfm
  http://www.engc.org.uk/professional-qualifications/standards/uk-spec
  http://www.qaa.ac.uk/Publications/InformationAndGuidance/Documents/Engineering10.pdf

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 & Understanding				Subject-specific skills						Thinking skills						Other skills relevant to employment and personal development				
				A1	A2	A3	A4	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	D1	D2	D3	D4	D5
LEVEL 6	EL3007	Robotics & Autonomous Systems	O	X	X			X	X		X			X		X				X	X			
	EL3102	Control Systems	O	X	X			X	X					X						X	X			
	EL3105	Computer Vision	O	X	X			X	X							X	X			X	X			
	EL3121	Communication Engineering	O		X			X	X				X							X	X			
	EL3147	Digital Signal & Image Processing A	O	X	X			X	X		X	X		X						X	X			
	EL3241	Operational Amplifier Systems	O	X	X			X	X		X			X						X	X			
	EL3243	Embedded Real-Time Systems	†	X	X			X	X		X			X		X	X			X	X			
	EL3245	IC Design	O					X	X		X										X			
	EL3250	Microcontroller Systems	COMP					X	X											X	X			
	EL3251	System on Programmable Chip	†	X		X		X	X		X			X							X			
	EL3300	Machine Intelligence	O		X			X	X					X							X			
	EL3425	Computer Aided Instrumentation	O	X				X	X					X	X					X	X			
	EL3995	Project	C	X		X		X	X	X	X	X	X	X	X	X	X		X	X	X	X		X
	EL3996	Engineering Professionalism	COMP			X	X					X	X					X		X	X			X

† Students' option selection must include one of the indicated pairs of modules

NOTE: The Industrial Placement module MP2899 is taken by Sandwich students and leads to an award (Honours Degree or Degree) 'with Industrial Placement'. The specific Learning Outcomes unique to this module, and addressed within it, are:

(1) Apply the basic knowledge and skills acquired during academic study at Level 4 and Level 5 in a professional engineering environment
(2) Contribute independently and confidentially to team and individual engineering projects
(3) Describe the position of engineering as a dimension of business activity
(4) Demonstrate a mature and professional attitude to work

18. Curriculum Skills Map (Part B: Levels 4 & 5)

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 & Understanding				Subject-specific skills						Thinking skills						Other skills relevant to employment and personal development				
				A1	A2	A3	A4	B1	B2	B3	B4	B5	B6	C1	C2	C3	C4	C5	C6	D1	D2	D3	D4	D5
LEVEL 5	EL2006	Data Communications	O	X	X			X	X		X										X			
	EL2007	Robotic Systems	O*	X	X			X	X		X	X	X	X		X				X	X			
	EL2106	Signals & Systems	COMP	X	X			X	X		X			X						X	X			
	EL2205	Electronic Systems Applications	COMP	X	X	X		X	X	X	X			X	X		X			X	X			
	EL2241	Electronic Systems	COMP	X	X			X	X		X									X	X	X	X	
	EL2242	Digital Systems	COMP					X	X		X										X			
	EL2243	Embedded System Design	O*	X	X	X		X	X		X		X	X	X						X			
	EL2245	ECAD	O*	X	X				X		X										X			
	EL2311	Software Development 2	COMP		X			X			X		X		X	X					X			
	EL2011/3	SIM	O	X																	X	X		
	EF2318	Upper-Intermediate English for Franchised Programmes	C**			X														X	X			
LEVEL 4	ER1010	Engineering Analysis	COMP*		X			X													X			
	ER1630	Engineering Applications	COMP*	X			X	X	X					X						X	X			X
	ER1730	Electronics and Electronic Engineering Practice	COMP*	X	X			X	X	X	X				X		X			X	X	X		X
	ER1731	Digital Electronics and Programmable Systems	COMP*	X	X			X	X		X			X	X		X			X	X			
	EL1205	Electronic Engineering Practice	COMP**	X				X	X	X	X	X			X		X				X	X		X
	EL1242	Digital Electronics	COMP**	X	X			X	X		X				X					X	X			
	EL1311	Software Development 1	COMP**					X			X				X		X			X	X			
	EL1211	Engineering Mathematics	COMP**		X																X			
	EL1241	Analogue Electronics	COMP**	X	X			X	X		X			X							X			
	EF1218	Intermediate English for Franchised Programmes	C**																	X	X			

* Available at UCLan only

***** Available at Beijing Institute of Technology only

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

19. LEARNING OUTCOMES FOR EXIT AWARDS:

For **each exit award available**, list learning outcomes relating to the knowledge and understanding, subject specific skills, thinking, other skills relevant to employability and personal development that a typical student might be expected to gain as a result of successfully completing each level of a course of study.

Learning outcomes for the award of: CertHE Electronic Engineering

Demonstrate knowledge and understanding of the essential concepts and physical principles of the Electronic Engineering discipline:

(iii) applicable to electronic component and circuit design; instrumentation and measurement; signal processing, conditioning and conversion

(iv) applicable to digital and programmable system design, associated methodologies of programming and hardware description languages

Demonstrate knowledge and understanding of mathematics underpinning the Electronic Engineering discipline; system analysis, computational algorithms

Ability to apply engineering principles, general physical principles and underlying engineering science to the analysis and solution of engineering problems

Practical application of theory to quantitative models and computer software for the simulation, design and verification of electronic systems and devices

Manage costs in order to produce system designs which both meet defined requirements and are economically viable

Demonstrate practical competencies in laboratory and workshop skills required for the test, measurement and fabrication of electronic systems and devices

Ability to define a problem including understanding customer needs

Manage design processes and evaluate outcomes

Effective exploitation of literature, locate and critically evaluate information from a variety of sources

Communicate in an accurate, persuasive and succinct form, via a variety of media

Personal development planning, self-directed learning and reflection for future CPD

Learning outcomes for the award of: DipHE Electronic Engineering

Demonstrate knowledge and understanding of the essential concepts and physical principles of the Electronic Engineering discipline:

(iii) applicable to electronic component and circuit design; instrumentation and measurement; signal processing, conditioning and conversion

(iv) applicable to digital and programmable system design, associated methodologies of programming and hardware description languages

Demonstrate knowledge and understanding of mathematics underpinning the Electronic Engineering discipline; system analysis, computational algorithms

Appreciation of the wider commercial and economic context of engineering, applicable business and management techniques, relevant social and legal constraints

Ability to apply engineering principles, general physical principles and underlying engineering science to the analysis and solution of engineering problems

Practical application of theory to quantitative models and computer software for the simulation, design and verification of electronic systems and devices

Manage costs in order to produce system designs which both meet defined requirements and are economically viable

Demonstrate practical competencies in laboratory and workshop skills required for the test, measurement and fabrication of electronic systems and devices

Ability to apply systems analysis techniques to the top-level design of electronic systems, and the decomposition and synthesis of sub-systems using appropriate technologies

Ability to define a problem including understanding customer needs

Manage design processes and evaluate outcomes

Effective exploitation of literature, locate and critically evaluate information from a variety of sources

Communicate in an accurate, persuasive and succinct form, via a variety of media

Work effectively as part of a team

Personal development planning, self-directed learning and reflection for future CPD

Learning outcomes for the award of: BEng Electronic Engineering

Demonstrate knowledge and understanding of the essential concepts and physical principles of the Electronic Engineering discipline:

(iii) applicable to electronic component and circuit design; instrumentation and measurement; signal processing, conditioning and conversion

(iv) applicable to digital and programmable system design, associated methodologies of programming and hardware description languages

Demonstrate knowledge and understanding of mathematics underpinning the Electronic Engineering discipline; system analysis, computational algorithms

Appreciation of the wider commercial and economic context of engineering, applicable business and management techniques, relevant social and legal constraints

Ability to apply engineering principles, general physical principles and underlying engineering science to the analysis and solution of engineering problems

Practical application of theory to quantitative models and computer software for the simulation, design and verification of electronic systems and devices

Manage costs in order to produce system designs which both meet defined requirements and are economically viable

Demonstrate practical competencies in laboratory and workshop skills required for the test, measurement and fabrication of electronic systems and devices

Ability to apply systems analysis techniques to the top-level design of electronic systems, and the decomposition and synthesis of sub-systems using appropriate technologies

Ability to define a problem including understanding customer needs

The ability to creatively apply engineering principles to establish innovative solutions and to ensure their fitness for purpose

Manage design processes and evaluate outcomes

Effective exploitation of literature, locate and critically evaluate information from a variety of sources

Communicate in an accurate, persuasive and succinct form, via a variety of media

Independence, self-awareness, and the intrinsic motivation to develop technical proficiencies and achieve goals without external influence

Work effectively as part of a team

Personal development planning, self-directed learning and reflection for future CPD

UNIVERSITY OF CENTRAL LANCASHIRE

Programme Specification

1. Awarding Institution / Body	University of Central Lancashire
2. Teaching Institution and Location of Delivery	University of Central Lancashire Preston campus
3. University School	School of Engineering
4. External Accreditation	N/A
5. Title of Final Award	MEng (Hons) / BEng (Hons) / BSc (Hons) Engineering (Foundation Entry) (non-award bearing programme: initial stage of 5-year (MEng) or 4-year (BEng / BSc) degree course)
6. Modes of Attendance offered	Full-time / Part-Time *Note that part-time attendance mode is not guaranteed to be one day per week.*
7. UCAS Code	TBD
8. Relevant Subject Benchmarking Group(s)	QAA Subject Benchmarking Statements: Engineering (2015), and Construction, Property & Surveying (2008). *Note that the QAA SBSs mainly focus on Bachelor's degree with honours level and Master's level, and so are informative rather than directly applicable to this Foundation Year Entry course.*
9. Other external influences	Engineering Council UK-SPEC QAA
10. Date of production/revision of this form	4 May 2016
11. Aims of the Programme	
• **To equip the student with a broad range of subject-specific and transferable skills that will enable progression to a range of undergraduate honours programmes (BSc / BEng / MEng) within the School of Engineering, most of which lead to awards with Professional Accreditation.**	

- **To enable the student to gain confidence as an independent learner and the ability to reflect on their own range of skills and knowledge.**
- **To encourage the student to identify and pursue further learning opportunities and / or employment.**
- **To encourage the student to develop an awareness of the role of the engineer, and other related professions, in industry.**

12. Learning Outcomes and Teaching, Learning and Assessment Methods

A. Knowledge and Understanding

On successful completion of the programme the students will be able to:

A1. Demonstrate the skills necessary to undertake undergraduate degree level study in areas covered by the School of Engineering, including basic ICT skills and mathematics.

A2. Explain and apply the basic principles relevant to a range of areas covered in courses within the School of Engineering.

A3. Discuss the external factors impacting various areas covered in courses within the School of Engineering.

Teaching and Learning Methods

A range of teaching and learning methods will be used such as lectures, tutorials, workshops, discussions, feedback sessions, practical sessions, design exercises and simulations, including use of ICT and online materials (via elearn / Blackboard).

Assessment Methods

A range of assessment methods will be used such as portfolios, examinations, practical exercises and team-work exercises. Formative assessment will include peer/self-evaluation and on-line evaluation.

B. Subject-Specific Skills

On successful completion of the programme the students will be able to:

B1. Demonstrate a logical approach to problem solving, design and analysis.

B2. Communicate effectively through written, graphical and oral presentations.

B3. Demonstrate basic competence in academic research methods including use of ICT and electronic resources.

Teaching and Learning Methods

A range of teaching and learning methods will be used such as lectures, tutorials, workshops, discussions, feedback sessions, practical sessions, design exercises and simulations, including use of ICT and online materials (via elearn / Blackboard).

Assessment Methods

A range of assessment methods will be used such as portfolios, examinations, practical exercises and team-work exercises. Formative assessment will include presentations, peer/self-evaluation and on-line evaluation.

C. Thinking Skills

On successful completion of the programme the students will be able to:

C1. Demonstrate effective decision-making in the context of understanding and solving problems related to areas covered in courses within the School of Engineering.

C2. Recognise and apply appropriate techniques to develop solutions to real-world problems.

C3. Reflect on their own understanding and begin to develop critical judgements.

Teaching and Learning Methods

A range of teaching and learning methods will be used such as lectures, tutorials, workshops, discussions, feedback sessions, practical sessions, design exercises and simulations, including use of ICT and online materials (via elearn / Blackboard).

Assessment Methods

A range of assessment methods will be used such as portfolios, examinations, practical exercises and team-work exercises. Formative assessment will include presentations, peer/self-evaluation and on-line evaluation.

D. Other skills relevant to employability and personal development

On successful completion of the programme the students will be able to:
D1. Work independently and manage time effectively.
D2. Demonstrate effective communication using reports and presentations.
D3. Demonstrate effective ICT skills.

Teaching and Learning Methods

A range of teaching and learning methods will be used such as lectures, tutorials, workshops, discussions and feedback sessions, including use of ICT and online materials (via elearn / Blackboard).

Assessment Methods

A range of assessment methods will be used such as portfolios and team-work exercises. Formative assessment will include presentations, peer/self-evaluation and on-line evaluation.

13. Programme Structure				**14. Awards and Credits**
Level	**Module Code**	**Module Title**	**Credit rating**	
3	ERC001	Study Skills	20	**BSc (Hons) / BEng (Hons) / MEng (Hons) Engineering (Foundation Entry) Requires completion of 120 credits at Level 3.** **Successful completion of the six Foundation Year Entry modules at the appropriate performance level (see below) leads to progression to Year 1 of appropriate undergraduate programmes within the School of Engineering.** **An average mark of 60% or above is required for progression to MEng (Hons) courses.** **MEng (Hons) Aerospace Engineering** **MEng (Hons) Computer Aided Engineering** **MEng (Hons) Civil Engineering** **MEng (Hons) Electronic Engineering** **MEng (Hons) Energy Engineering** **MEng (Hons) Fire Engineering** **MEng (Hons) Mechanical Engineering** **MEng (Hons) Motor Sports Engineering** **MEng (Hons) Oil and Gas Safety Engineering** **MEng (Hons) Robotics Engineering**
	ERC002	Basic Mathematics	20	
	ERC003	Information and Communications Technology	20	
	ERC004	Practical Skills	20	
	ERC005	Design Studies	20	
	ERC006	Analytical Studies	20	

				An average mark of 50% or above is required for progression to **BEng (Hons) Aerospace Engineering** **BEng (Hons) Computer Aided Engineering** **BEng (Hons) Civil Engineering** **BEng (Hons) Electronic Engineering** **BEng (Hons) Energy Engineering** **BEng (Hons) Fire Engineering** **BEng (Hons) Mechanical Engineering** **BEng (Hons) Mechanical Maintenance Engineering** **BEng (Hons) Motor Sports Engineering** **BEng (Hons) Oil and Gas Safety Engineering** **BEng (Hons) Robotics Engineering** **BEng (Hons) Building Services and Sustainable Engineering** **An average mark of 40% or above is required for progression to** **BSc (Hons) Building Surveying** **BSc (Hons) Construction Project Management** **BSc (Hons) Facilities Management** **BSc (Hons) Quantity Surveying** **BSc (Hons) Fire and Leadership Studies** **BSc (Hons) Fire Safety and Risk Management** **Details of the delivery and focus of some of the modules would depend on the specific programme the student is registered for. Progression to School of Engineering programmes other than the programme for which the student is registered may be subject to interview.**

15. Personal Development Planning

PDP-related learning is presented informally at induction and is supported in all six modules in various respects. Students will be expected to develop a portfolio of their work throughout the year (coursework, reports, completed example sheets etc.), and discuss aspects of their personal and professional development with members of the course team including their Academic Advisor.

16. Admissions Criteria

Standard entrants will require 200 points at A-level (from two A-level passes), or 160 points (MPP) at BTEC, or equivalent. GCSE-level Mathematics and English at grade C or above are required. There are no other mandatory formal educational or specialist knowledge requirements for admission to this Foundation Year Entry programme.

Non-standard entrants will be considered on an individual basis, normally through interview, and are expected to be able to demonstrate personal reflection on their career to-date and show a strong desire and ability to study. They may be asked to produce a piece of written work to help assess their ability to benefit from the programme.

International applicants will have to demonstrate that they will benefit from the course and that they have a good grasp of the English language: English should be at the standard IELTS level required (or equivalent) by the University for admission to a Foundation Year

Entry course at level 3, i.e. an overall IELTS score of 6.0 or higher with no subscore below 5.5.
17. Key sources of information about the programme
• UCLan web pages and prospectus.
• UCAS website
• Other UCLan marketing activities, e.g. Open Days etc.

18. Curriculum Skills Map

Level	Module Code	Module Title	Core (C), Compulsory (Comp)	Knowledge and Understanding			Subject-Specific Skills			Thinking Skills			Other skills relevant to employability and personal development		
				A1	A2	A3	B1	B2	B3	C1	C2	C3	D1	D2	D3
Level 3	ERC001	Study Skills	Comp	X	X	X	X	X	X			X	X	X	X
	ERC002	Basic Mathematics	Comp	X	X	X	X	X		X	X	X	X		
	ERC003	ICT	Comp	X	X		X	X	X	X	X	X	X	X	X
	ERC004	Practical Skills	Comp	X	X	X	X	X	X	X	X	X	X	X	X
	ERC005	Design Studies	Comp	X	X	X	X	X	X	X	X	X	X	X	X
	ERC006	Analytical Studies	Comp	X	X	X	X	X	X	X	X	X	X	X	X