# Course Handbook

## BEng (Hons) Aerospace Engineering with Pilot Studies
## MEng (Hons) Aerospace Engineering with Pilot Studies

2019-2020

Dr Abdullah Desai
School of Engineering

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



**COURSE SUBJECT TO CHANGE**

**Contents**

## 1. Welcome to the course

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

Dr Abdullah Desai – Course Leader for MEng/BEng (Hons) Aerospace Engineering and Pilot Studies.

### 1.1 Rationale, aims and learning outcomes of the course

The BEng/MEng (Hons) Aerospace Engineering with Pilot Studies course aim is to develop graduates with a broad understanding of current technology and practice in aerospace engineering, covering the relevant aspects of vehicles, systems, design and analysis.

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: MEng/BEng (Hons) Aerospace Engineering with Pilot Studies and Industrial Placement.

- Develop knowledge, understanding and skills necessary for successful careers in aerospace engineering, commercial aviation and for continuous professional development.
- Develop the intellectual, practical and team-working skills to (a) identify, interpret and analyse engineering problems, (b) postulate, develop and assess possible solutions and (c) select, justify and deliver optimised solutions.
- Develop relevant personal skills to take responsibility for individual learning and development.
- Develop skills in the use of computing, planning and problem-solving methods, as well as the practice of effective communication.
- Meet the needs of industry and satisfy the accreditation requirements of professional engineering institutions.
- (***Specific to MEng***) Develop knowledge, understanding and skills necessary for technical leadership and specialisation. This includes Air Transport Pilots Licence theory for roles within commercial aviation.
- (***Specific to Industrial Placement***) Experience the practice of engineering in industry and the operation of engineering companies.

The discipline of Aerospace Engineering with Pilot Studies encompasses a wide skills base and the emphasis of this course is placed on system-level design rather than that of individual component devices. By concentrating on the principles fundamental to multi-system integration, the course equips graduates with the knowledge, skills and confidence to thrive in the rapidly evolving field of aerospace 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 referenced in the Appendices.

### 1.2 Course Team

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

Dr Martin Varley
Academic Lead for Aerospace Engineering and Pilot Studies
Computing & Technology Building, room CM149
☎ 01772 89 3272, ✉ mrvarley@uclan.ac.uk

Dr Abdullah Desai
Course Leader of Aerospace Engineering and Pilot Studies
Computing & Technology Building, room CM131
☎ 01772 89 2688, ✉ adesai10@uclan.ac.uk

Mrs Joanne Orlick
Lecturer of Aerospace Engineering
Computing & Technology Building, room CM015
☎ 01772 89 3518, ✉ jorlick1@uclan.ac.uk

Mr Steven Jones
Lecturer of Aerospace Engineering
Industrial Placements Tutor
Computing & Technology Building, room CM015
☎ 01772 89 4208, ✉ sjones50@uclan.ac.uk

Dr Jules Simo
Lecturer of Aerospace Engineering
Computing & Technology Building, room CM021
☎ 01772 89 3545, ✉ jsimo@uclan.ac.uk

Prof Darren Ansell
Professor of Aerospace Engineering
Computing & Technology Building, room CM237
☎ 01772 89 5304, ✉ dansell@uclan.ac.uk

Dr Matthew Stables
Retention Co-ordinator
Kirkham Building, room KM001
☎ 01772 89 3581, ✉ mstables1@uclan.ac.uk

Campus Admin Services is located in the Computer and Technology Building room. Hub contact details are as follows:

☎ 01772 89 1994 or 01772 89 1995, ✉ CandThub@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.

Please refer to staff profile pages on the UCLan website for more on the aerospace team members.

### 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.

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

The School of Engineering will primarily contact you via your UCLan email address, but you should also regularly check the Starfish system (student relationship management software). Details on how to do this will be given during your induction weeks, and by your academic advisors. Students can contact staff members by email, but please be aware that staff members may at times be away on business or research trips and not always have immediate access to email. In the event you need to contact a member of staff urgently then you are free to contact any other members of the aerospace team detailed above. Appointments with staff should be made via email or by using the Starfish system.

### 1.7 External Examiner

The University has appointed an External Examiner to your course who helps to ensure that the standards of your course are comparable to those provided at other higher education institutions in the UK. The name of this person, their position and home institution can be found below.

Dr Dale Richards
Senior Lecturer, Nottingham Trent University, UK.

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

Table 1 and Table 2 illustrate the programme structure for BEng (Hons) and MEng (Hons) 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.

Please note that the programme structures may be subject to minor modifications to reflect improvements/developments in the course or within industry. If this is the case your current year of study will not be affected and you will be notified of the changes for future year(s) of study.
There is also a foundation entry route and details of course structure can be found in the appendix.

**BEng(Hons) Aerospace Engineering with Pilot Studies**

| **Level Four** | | |
|---|---|---|
| **Module code** | **Module title** | **Credit value** |
| **Compulsory modules** | | |
| ER1631 | Aerospace Vehicles | 30 |
| ER1020 | Engineering Design | 30 |
| ER1030 | Engineering Science | 30 |
| ER1010 | Engineering Analysis | 30 |

| **Level Five** | | |
|---|---|---|
| **Module code** | **Module title** | **Credit value** |
| **Compulsory modules** | | |
| EI2040 | Aircraft Design, Systems and Manufacture | 40 |
| EI2910 | Structures and FEA | 20 |
| MP2576 | Thermofluids | 20 |
| SC2153 | Further Engineering Mathematics and Simulation | 20 |
| EI2030 | Pilot Operations PPL | 20 |

| **Option (Level 6)** | | |
|---|---|---|
| EI3999 | Industrial Placement | 120 |

| **Level Six** | | |
|---|---|---|
| **Module code** | **Module title** | **Credit value** |
| **Compulsory modules** | | |
| EI3000 | Individual Project | 20 |
| EI3010 | Aircraft Design and Stability | 20 |
| EI3030 | Aeromechanics | 20 |
| EI3040 | Aerospace Propulsion | 20 |
| MP3604 | Advanced CAD | 20 |
| MP3732 | Operations Management B | 20 |

*Table 1 BEng Aerospace Engineering with Pilot Studies Programme Structure*

**MEng(Hons) Aerospace Engineering with Pilot Studies**

| **Level Four** | | |
|---|---|---|
| **Module code** | **Module title** | **Credit value** |
| **Compulsory modules** | | |
| ER1631 | Aerospace Vehicles | 30 |
| ER1020 | Engineering Design | 30 |
| ER1030 | Engineering Science | 30 |
| ER1010 | Engineering Analysis | 30 |

| **Level Five** | | |
|---|---|---|
| **Module code** | **Module title** | **Credit value** |
| **Compulsory modules** | | |
| EI2040 | Aircraft Design, Systems and Manufacture | 40 |
| EI2910 | Structures and FEA | 20 |
| MP2576 | Thermofluids | 20 |
| SC2153 | Further Engineering Mathematics and Simulation | 20 |
| EI2030 | Pilot Operations PPL | 20 |

| **Option (Level 6)** | | |
|---|---|---|
| EI3999 | Industrial Placement | 120 |

| **Level Six** | | |
|---|---|---|
| **Module code** | **Module title** | **Credit value** |
| **Compulsory modules** | | |
| EI3000 | Individual Project | 20 |
| EI3010 | Aircraft Design and Stability | 20 |
| EI3030 | Aeromechanics | 20 |
| EI3040 | Aerospace Propulsion | 20 |
| MP3604 | Advanced CAD | 20 |
| MP3732 | Operations Management B | 20 |

| **Level Seven** | | |
|---|---|---|
| **Module code** | **Module title** | **Credit value** |
| **Compulsory modules** | | |
| EI4000 | Aerospace Group Project | 40 |
| EI4060 | Pilot Studies ATPL Part 1 | 30 |
| EI4070 | Pilot Studies ATPL Part 2 | 30 |
| MP4580 | Engineer and Society | 20 |

*Table 2 MEng Aerospace Engineering with Pilot Studies Programme Structure*

### 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. Module codes are as shown in Table 1 and 2 above.

## 2.3 Course requirements


For those students who are actively aiming to gain a Private Pilot's License, the B.Eng route will provide the necessary theoretical training. An optional fee payable to a partner flight training school will be necessary in order for you to gain the practical flight training required (currently approx. 45 hours). You may use our UCLan flight simulators to practice and develop your flying skills during your course.

After securing a PPL, some students may wish to study for an ATPL qualification where additional costs payable to a flight-training organisation will be incurred. To sit ATPL theoretical examinations with the Civil Aviation Authority a PPL is an essential pre-requisite; the cost of this can be as little as £6,000. At UCLan you can sit the PPL CAA examinations in year 2 of our Aerospace Engineering with Pilot Studies course, but not the formal CAA ATPL qualifications. Instead UCLan provides ATPL training and our own internal examination to prepare you for CAA examinations, once you have completed this course you will be in a position to enrol with a CAA ATPL provider and complete your ATPL examinations from as little as £999 plus your examination fees to the CAA for £966. Upon completing these examinations, you will be ready to undertake your professional flight training with your provider of choice. Estimated cost varies with different providers, approximately £27,000; which would include a Commercial Pilots Licence, Instrument Rating, Multi-Engine Piston Rating and a Multi-Crew Cooperation course. These additional costs are correct at the time of production of this handbook and are subject to change. You would be responsible for pursuing your CAA ATPL examinations after graduation from the M.Eng Course.

## 2.4 Module Registration Options

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

## 2.5 Study Time

### 2.5.1 Weekly timetable

A timetable will be available once you have enrolled onto the programme, through the Student Portal.

### 2.5.2 Expected hours of study

As outlined in the school handbook the normal amount of work involved in achieving a successful outcome to your studies is to study for 10 hours per each credit you need to achieve – this includes attendance at UCLan and time spent in private study.

This translates to a total of 6 hours per 20 credit module per week. We expect that you commit 36 hours study per week (pro-rata for part-time students and/or semester-based modules), inclusive of your contact hours. So for a typical module you may have a 2 hour lecture, and a 1 hour tutorial, leaving you approximately 3 hours for self-directed study (further reading, tutorial questions, assignments, revision). This is thinking time – not coffee and biscuits time! 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.

### 2.5.3 Attendance Requirements

You are required to attend all timetabled learning activities for each module. Notification of illness or exceptional requests for leave of absence must be made to:

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 as follows:

Notification of illness should be made to the Campus Admin Services: ☎ +44 1772 891994 or 01772 891995 | ✉ CandThub@uclan.ac.uk

Exceptional absence requests are to be made to Dr Martin Varley (Academic Lead for Aerospace Engineering): ☎ 01772 89 3272, ✉ mrvarley@uclan.ac.uk

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

You should be aware that persistent non-attendance can lead to your withdrawal from the course. Students can check their own attendance record through myUCLan.

## 3. Approaches to teaching and learning

### 3.1 Learning and teaching methods

Aerospace Engineering is the primary field of engineering concerned with the development of aircraft and spacecraft. It has two major and overlapping branches: aeronautical engineering and astronautical engineering.

Consequently, the subject matter covered is diverse and the School therefore uses a diverse portfolio of teaching and assessment methods to reflect the nature of this subject. There are formal lectures followed up by small group tutorials in which the subject of the lecture is explored in detail. Practical skills are developed through practical sessions which may incorporate stand-alone practical exercises or individual or group projects. You are also encouraged to engage in independent study. Most of the course is delivered by university staff but, where appropriate, experts in their own field are brought in to speak with authority from their own experience and expertise.

For some modules, you will also be studying along students on other courses, in particular students studying Mechanical Engineering and Motor Sports Engineering and other courses in the School of Engineering. This approach will also allow you to interact and learn from others with different backgrounds and expertise.

As with all university education you are responsible for your own learning; the lectures are merely the starting point and you will have to undertake a substantial amount of study in order to succeed.

The School has specialist teaching facilities such as flight simulators and is also equipped with analytical facilities that include most modern scientific instrumental techniques.

The aim of the School is to promote deep and active learning and for the students to achieve an appropriate balance between (a) the accumulation of subject specific knowledge (b) the understanding of subject-specific concepts (c) the application of these and (d) the development of general investigative and presentational skills.

At Level 4 hour-long class sessions will normally be lectures or tutorials. In practice the lectures provide the theoretical background to the subject and tutorials often include problem solving exercises managed through pair or group work. The tutorials will also introduce you to the use of basic techniques and reinforce concepts introduced as theory. In addition tutorial work may also include the development of teamwork, planning, understanding accuracy and variability, and the generation and testing of hypotheses.

Modules at Level 5 and 6 will also be delivered via a mixture of teaching methods, with increased emphasis on independent study followed by discussions, presentations and data-interpretation/problem-solving exercises. A range of other skills will be developed, e.g. debating skills through discussions and oral presentations.

These learning experiences are designed to help you to master the many aspects of aerospace engineering during the course of your degree, and are assessed through an equally wide range of exercises, designed to develop and improve your key skills (e.g. writing, referencing, report writing) as well as to assess your knowledge.

The assessment methods for the modules are different: some will be by examination, some by written assessment, presentations or a combination of these. For example, in the first year, coursework will include formats such as short notes, practical reports, structured workbooks, short directed essays, and data handling exercises, which will help to prepare you for longer essays, independent practical reports and practical examinations in the second year. The third year will include dissertation or a project report and use longer essays and more challenging data handling exercises. In terms of examinations, in the first year, short questions are the preferred format. In the second year, essay questions and data handling will be introduced; and the third year will comprise primarily longer essays, reports and more challenging analysis of data.

### 3.2 Study skills

To develop the skills of communications e.g. report writing, giving presentations, use of information technology and appropriate computer-based tools, numeracy, e.g. mathematical analysis, graphical methods for representing experimental data, problem solving e.g. develop the ability to analyse a particular problem, Individual study skills e.g. time management, planning, use of different information sources etc.

WISER http://www.uclan.ac.uk/students/study/wiser/index.php
IT Skills training https://www.uclan.ac.uk/students/study/it_skills_training.php
Worldwise Learning Centre https://www.uclan.ac.uk/students/study/worldwise/index.php

### 3.3 Learning resources

#### 3.3.1 Learning Information Services (LIS)

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

### 3.4 Personal development planning

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

### 3.5 Preparing for your career

We encourage all students to seek out extra-curricular opportunities to enhance your learning and development during the course of your studies. Examples include industrial placements, assisting academic research staff with research projects and wider activities.

## 4. Student Support

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

### 4.1 Academic Advisors

Academic advisors provide help for students with problems and are responsible for overseeing the progress of students, their welfare, academic counselling and guidance. Your Academic advisor is allocated when you enrol. You must see your Academic advisor 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 advisors 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.

The 'i' is a central Student Information Centre and your first point of contact. You can obtain information on a wide range of topics including Council Tax Exemption Certificates, Bank and Confirmation of Study Letters, Portable Financial Credits, (continuing students only, Printing and Printer Credit, UCLan Cards, the ‘i’ shop and UCLan Financial Support Bursary (first year students only).

### 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.

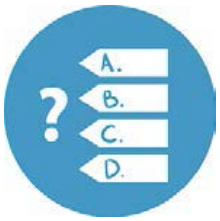
Arrangements are made for students who have a disability/learning difficulty for which valid supporting evidence can be made available. Contact the Disability Adviser for advice and information, disability@uclan.ac.uk

### 4.3 Students' Union One Stop Shop

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

## 5. Assessment

### 5.1 Assessment Strategy




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

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

Assessment is continuous and uses both formative and summative methods. Formative assessment relates to the continuing and systematic appraisal of the degree of learning. This helps you by providing feedback on the appropriateness of your study skills in meeting the learning objectives. It also assists the academic staff by providing information about the appropriateness of the learning environment in facilitating student learning. Formative assessment includes strategies that encourage you and your tutor to build on our strengths and to plan remedial help to correct identified weaknesses. Formative assessment encourages the development of personal self-awareness and self-evaluation such that corrective change can be instigated by the individual.

### 5.2 Notification of assignments and examination arrangements

You will be notified of assessments by your module tutors. They will advise you of the requirements, the marking criteria and of the respective submission dates or exam arrangements, during one or more of the timetabled sessions. In general the examination arrangements are available from the University web site. These arrangements are not generally made by the module tutors.

Submission of coursework assignments is typically by one of two methods details of which will be given in the assignment brief. Electronic submissions are made through the Blackboard site for the module, using the Turnitin software.

### 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. The default referencing is the Harvard referencing system (a guide to this system can be found on the Engineering@UCLan course space, accessed through the student portal). Please use this unless you are directed differently within your assignment brief.

### 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. Module and course leaders are always interested in your feedback and it is invaluable to continually improve the course. You can also get involved in more formal student staff liaison committee meetings too (see below).

### 7.1 Student Staff Liaison Committee meetings (SSLCs)

Details of the Protocol for the operation of SSLCs is included in section 8.2 of the University Student Handbook. The purpose of a SSLC meeting is to provide the opportunity for course representatives to feedback to staff about the course, the overall student experience and to inform developments which will improve future courses. These meetings are normally scheduled once per semester.

## 8. Appendices

### 8.1 Programme Specification(s)

Appendix 1 - Programme Specification for BEng (Hons) Aerospace Engineering with Pilot Studies

Appendix 2 - Programme Specification for MEng (Hons) Aerospace Engineering with Pilot Studies

**Appendix 1**

## Programme Specification – BEng (Hons) Aerospace Engineering with Pilot Studies

**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** | *Royal Aeronautical Society (RAeS)*<br>*(Accreditation is currently being sought.)*<br>*Institution of Mechanical Engineers (IMechE)*<br>*(Accreditation is currently being sought.)* |
| **5. Title of Final Award** | BEng (Hons) Aerospace Engineering with Pilot Studies.<br>BEng (Hons) Aerospace Engineering with Pilot Studies (with Industrial Placement). |
| **6. Modes of Attendance offered** | Full Time<br>Part Time |
| **7. a) UCAS Code** | AE10 |
| **b) JACS Code** | H400 |
| **c) HECoS Code** | 100115 |
| **8. Relevant Subject Benchmarking Group(s)** | QAA Engineering |
| **9. Other external influences** | UK Engineering Council (EC-UK)<br>QAA Academic Infrastructure |
| **10. Date of production/revision of this form** | March 2019 |

| **11. Aims of the Programme** |
|---|
| • Develop knowledge, understanding and skills necessary for successful careers in aerospace engineering, commercial aviation and for continuous professional development. |
| • Develop the intellectual, practical and team-working skills to (a) identify, interpret and analyse engineering problems, (b) postulate, develop and assess possible solutions and (c) select, justify and deliver optimised solutions. |
| • Develop relevant personal skills to take responsibility for individual learning and development. |
| • Develop skills in the use of computing, planning and problem-solving methods, as well as the practice of effective communication. |

- Meet the needs of industry and satisfy the accreditation requirements of professional engineering institutions.
- (***Specific to Industrial Placement***) Experience the practice of engineering in industry and the operation of engineering companies.

## 12. Learning Outcomes, Teaching, Learning and Assessment Methods

### A. Knowledge and Understanding

A1. Demonstrate knowledge and understanding of essential facts, concepts, theories and principles of aerospace engineering, and its underpinning science and mathematics.

A2. Describe the wider multidisciplinary engineering context and its underlying principles.

A3. Apply the fundamental concepts of the social, environmental, ethical, economic and commercial considerations affecting the exercise of engineering judgement.

A4. Demonstrate the ability to research, learn and critically discuss new theories, concepts, methods etc. in unfamiliar situations and applications.

**Teaching and Learning Methods**

| | |
|---|---|
| Lectures, Seminars and Tutorials | A1, A2, A3 |
| Active Learning | A3, A4 |
| Practical Sessions | A1 |
| Supervised Workshops | n/a |
| Project Reviews | A1, A2 |

**Assessment methods**

| | |
|---|---|
| Written Exam | A1, A2 |
| Coursework | A1, A2, A3 |
| Practical Assessment | A1, A2, A3 |

### B. Subject-specific skills

B1. Undertake practical engineering skills (acquired through laboratories, workshops, design, etc.) and show evidence of team-working, project participation and leadership abilities.

B2. Demonstrate use of engineering analysis in order to interpret problems, assess technologies, propose solutions, implement processes and enable continuous improvement.

B3. Create and develop viable products, processes and systems and ensure fitness for purpose.

B4. Apply appropriate resources, methods, tools and processes used within engineering practice.

**Teaching and Learning Methods**

| | |
|---|---|
| Lectures, Seminars and Tutorials | B2, B4 |
| Active Learning | B2 |
| Practical Sessions | B1, B4 |
| Supervised Workshops | B1, B3 |
| Project Reviews | B1 |

**Assessment methods**

| | |
|---|---|
| Written Exam | B2 |
| Coursework | B1, B2, B3, B4 |
| Practical Assessment | B1, B3 |

### C. Thinking Skills

C1. Compare, select and apply appropriate quantitative science and engineering tools to the analysis of multi-dimensional problems.

C2. Demonstrate creative and innovative ability in synthesising solutions and in formulating designs.

C3. Analyse the broader engineering picture and thus work with an appropriate level of detail.

C4. Develop, monitor and update an engineering project plan in an appropriate operating environment.

**Teaching and Learning Methods**

| | |
|---|---|
| Lectures, Seminars and Tutorials | C1 |
| Active Learning | C2 |
| Practical Sessions | C1 |
| Supervised Workshops | n/a |

| | |
|---|---|
| Project Reviews | C3, C4 |
| **Assessment methods** | |
| Written Exam | C1 |
| Coursework | C2, C3, C4 |
| Practical Assessment | C1 |

**D. Other skills relevant to employability and personal development**

D1. Develop transferable skills that will be of value in a wide range of situations, including problem-solving; communication; and working with others.

D2. Effectively use information technology to develop information retrieval skills with critical analysis.

D3. Plan and develop self-learning skills to improve performance as the foundation for lifelong learning and continuing professional development as a professional engineer.

D4. Monitor and adjust a personal programme of work on an on-going basis using recognised engineering management processes to learn independently.

| **Teaching and Learning Methods** | |
|---|---|
| Lectures, Seminars and Tutorials | D1, D3, D4 |
| Active Learning | n/a |
| Practical Sessions | D2 |
| Supervised Workshops | n/a |
| Project Reviews | D1 |
| **Assessment methods** | |
| Written Exam | n/a |
| Coursework | D3, D4 |
| Practical Assessment | D1, D2 |

| **13. Programme Structures** | | | | **14. Awards and Credits** |
|---|---|---|---|---|
| **Level** | **Module Code** | **Module Title** | **Credit Rating** | |
| Level 6 | EI 3000 | Individual Project (C) | 20 | **BEng (Hons) Aerospace Engineering with Pilot Studies**<br>360 credits including 220 credits at Level 5 or above and 100 credits at Level 6 or above.<br>**BEng Aerospace Engineering with Pilot Studies**<br>320 credits including 180 credits at Level 5 or above and 60 credits at Level 6 or above.<br>**BEng (Hons) Aerospace Engineering with Pilot Studies (with Industrial Placement)**<br>360 credits including 220 credits at Level 5 or above and 100 credits at Level 6 or above.<br>**BEng Aerospace Engineering with Pilot Studies (with Industrial Placement)**<br>320 credits including 180 credits at Level 5 or above and 60 credits at Level 6 or above.<br>Industrial placement route requires successful completion of EI3999 which has a notional credit of 120 credit. |
| | EI 3010 | Aircraft Design and Stability (COMP) | 20 | |
| | EI 3030 | Aeromechanics (COMP) | 20 | |
| | EI 3040 | Aerospace Propulsion (COMP) | 20 | |
| | MP3604 | Advanced CAD (COMP) | 20 | |
| | MP3732 | Operations Management B (COMP) | | |
| | EI 3999 | Industrial Placement (O) | 120 | |
| Level 5 | EI 2040 | Aircraft Design, Systems and Manufacture (COMP) | 40 | **Diploma of Higher Education Aerospace Engineering with Pilot Studies**<br>240 credits including 100 credits at Level 5 or above. |
| | EI 2910 | Structures and FEA (COMP) | 20 | |
| | MP2576 | Thermofluids (COMP) | 20 | |
| | EI 2030 | Pilot Operations PPL (COMP) | 20 | |
| | SC2153 | Further Engineering Mathematics and Simulation (COMP) | 20 | |

| | | | | |
|---|---|---|---|---|
| Level 4 | ER1631<br>ER1020<br>ER1030<br>ER1010 | Aerospace Vehicles (COMP)<br>Engineering Design (COMP)<br>Engineering Science (COMP)<br>Engineering Analysis (COMP) | 30<br>30<br>30<br>30 | **Certificate of Higher Education**<br>120 credits including 100 credits at Level 4 or above. |
| Level 3 | ERC001<br>ERC002<br>ERC003<br><br>ERC004<br>ERC005<br>ERC006 | Study Skills (COMP)<br>Basic Mathematics (COMP)<br>Information and Communications Technology (COMP)<br>Practical Skills (COMP)<br>Design Studies (COMP)<br>Analytical Studies (COMP) | 20<br>20<br>20<br><br>20<br>20<br>20 | **Foundation Entry**<br>Requires completion of 120 credits at Level 3. Students who exit after the Foundation year will receive a transcript of their modules and grades. |

Note: (C) for Core, (COMP) for Compulsory and (O) for Optional

## 15. Personal Development Planning

Professional development is an integral part of the course and includes sessions on personal qualities, self-management, effective communication and academic assessments, as well as professional and career management.

Services are available UCLan Student Support. Students are encouraged to consider "WISER", which offers help in learning how to study more effectively and how to communicate at an advanced and professional level.

Specific guidance on engagement, influence and impact is provided for project-based modules:

EI 2040 Aircraft Design, Systems and Manufacture
EI 3000 Individual Project

This guidance is reinforced by the academic advisor system. Each student will be allocated to a named lecturer who will act as an academic advisor for all years of study.

Preparation for "EI 3999 Industrial Placement" will commence at the start of the preceding year and will include advice and assistance on how to secure employment (e.g. how to complete application forms, how to write a CV and a covering letter, how to present at interview). While there are no pre-arranged placements and no guarantees of securing a placement, the programme team will offer positive support where practicable. Students who do secure an industrial placement will be allocated a Placement Tutor who will visit UK-based workplaces during that year.

## 16. Admissions criteria

Programme Specifications include minimum entry requirements, including academic qualifications, together with appropriate experience and skills required for entry to study. These criteria may be expressed as a range rather than a specific grade. Amendments to entry requirements may have been made after these documents were published and you should consult the University's website for the most up to date information. Students will be informed of their personal minimum entry criteria in their offer letter.

Our typical offer is 120 **UCAS** Points including Maths and Physics at B. We operate a flexible admissions policy and treat everyone as an individual. This means that we will take into consideration your educational achievements and predicted grades (where applicable) together with your application as a whole, including work experience and personal statement. General Studies accepted.

**BTEC Extended Diploma:** Distinction, Distinction, Merit (including Maths unit).
**Pass Access Course:** 122 UCAS Points
**International Baccalaureate:** Pass Diploma with 122 UCAS points from Higher Level Subjects
**IELTS:** 6.0 with no score lower than 5.5
**GCSE:** 5 at grade C/4 including Maths & English or equivalent.

## 17. Key sources of information about the programme

- **Internal**
  http://www.uclan.ac.uk/courses/beng_aerospace_engineering.php
- **External**

http://www.engc.org.uk/professional-qualifications/standards/uk-spec
http://www.qaa.ac.uk/en/Publications/Documents/Subject-benchmark-statement-Engineering-.pdf
http://www.qaa.ac.uk/publications/information-and-guidance
http://www.aerosociety.com/Assets/Docs/Membership/AccreditationHandbook.pdf
http://www.imeche.org/docs/default-source/tapd/acd001-annex-1-academic-accreditation-guidelines.doc?sfvrsn=4

## 18. Curriculum Skills Map

| Level | Module Code | Module Title | Core (C), Compulsory (COMP) or Option (O) | Programme Learning Outcomes | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Knowledge and understanding | | | | Subject-specific Skills | | | | Thinking Skills | | | | Other Skills | | | |
| | | | | *Ticks in boxes indicate that **Learning Outcomes** are being **assessed explicitly*** | | | | | | | | | | | | | | | |
| | | | | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 | D1 | D2 | D3 | D4 |
| LEVEL 6 | EI 3000 | Individual Project | C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | EI 3010 | Aircraft Design and Stability | COMP | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | |
| | EI 3030 | Aeromechanics | COMP | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| | EI 3040 | Aerospace Propulsion | COMP | ✓ | | | | | ✓ | | ✓ | ✓ | | | | | ✓ | | |
| | EI 3999 | Industrial Placement | O | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| | MP3604 | Advanced CAD | COMP | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | |
| | MP3732 | Operations Management B | COMP | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | |
| LEVEL 5 | EI 2040 | Aircraft Design, Systems and Manufacture | COMP | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| | EI 2910 | Structures and FEA | COMP | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | |
| | MP2576 | Thermofluids | COMP | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | |
| | SC2153 | Further Engineering Mathematics and Simulation | COMP | ✓ | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | | ✓ | ✓ | |
| | EI2030 | Pilot Studies PPL | COMP | ✓ | | | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ |
| LEVEL 4 | ER1631 | Aerospace Vehicles | COMP | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ | |
| | ER1030 | Engineering Science | COMP | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ | |
| | ER1020 | Engineering Design | COMP | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | | | ✓ | ✓ | | |
| | ER1010 | Engineering Analysis | COMP | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | | | ✓ | ✓ | | |

## 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.

For example, for a standard BA/BSc (Hons) award the exit award learning outcomes for CertHE (Level 4) and DipHE (Level 5), BA/BSc (Level 6) should be included; for a postgraduate Masters, this would normally be PGDip and PGCert (Level 7).

**Learning outcomes for the award of: CertHE**

A1. Demonstrate knowledge and understanding of basic facts, concepts, theories and principles of aerospace engineering, and its underpinning science and mathematics.
A2. Describe some aspects of the wider multidisciplinary engineering context and its underlying principles.
A4. Demonstrate the ability to learn new theories, concepts, methods etc. in unfamiliar situations.

B1. Undertake practical engineering skills (acquired through laboratories, workshops, design, etc.).
B2. Attempt in the use of engineering analysis in order to interpret problems, assess technologies, propose solutions and implement processes.
B4. Apply appropriate resources, methods, tools and processes used within engineering practice.

C1. Apply appropriate quantitative science and engineering tools to the analysis of problems.
C2. Demonstrate some level of creative and innovative ability in synthesising solutions and in formulating designs.

D1. Develop some transferable skills that will be of value in a wide range of situations, including problem-solving and communication.
D2. Effectively use some aspects of information technology and information retrieval skills.

**Learning outcomes for the award of: DipHE**

A1. Demonstrate knowledge and understanding of many aspects of essential facts, concepts, theories and principles of aerospace engineering, and its underpinning science and mathematics.
A2. Describe many aspects of the wider multidisciplinary engineering context and its underlying principles.
A3. Apply some of the fundamental concepts of the social, environmental, ethical, economic and commercial considerations affecting the exercise of engineering judgement.
A4. Demonstrate the ability to learn and critically discuss to an appropriate level new theories, concepts, methods etc. in unfamiliar situations and applications.

B1. Undertake practical engineering skills (acquired through laboratories, workshops, design, etc.) and show evidence of team-working, project participation and leadership abilities.
B2. Demonstrate systematic use of engineering analysis in order to interpret problems, assess technologies, propose solutions, implement processes and enable continuous improvement.
B3. Create and develop some aspects of viable products, processes and systems and ensure fitness for purpose.
B4. Apply appropriate resources, methods, tools and processes used within engineering practice.

C1. Select and apply appropriate quantitative science and engineering tools to the analysis of multi-dimensional problems.
C2. Demonstrate an appropriate level of creative and innovative ability in synthesising solutions and in formulating designs.
C3. Analyse the broader engineering picture and thus work with an appropriate level of detail.
C4. Develop, monitor and update aspects of an engineering plan in an appropriate operating environment.

D1. Develop many transferable skills that will be of value in a wide range of situations, including problem-solving; communication; and working with others.
D2. Effectively use information technology to develop information retrieval skills with critical analysis.
D3. Plan and develop self-learning to improve performance as the foundation for lifelong learning and continuing professional development.
D4. Monitor and adjust some aspects of a personal programme of work on an on-going basis to learn independently.

**Learning outcomes for the award of: BEng**

A1. Demonstrate knowledge and understanding of most aspects of essential facts, concepts, theories and principles of aerospace engineering, and its underpinning science and mathematics.
A2. Describe the wider multidisciplinary engineering context and its underlying principles.
A3. Apply most of the fundamental concepts of the social, environmental, ethical, economic and commercial considerations affecting the exercise of engineering judgement.
A4. Demonstrate the ability to research, learn and critically discuss new theories, concepts, methods etc. in unfamiliar situations and applications.

B1. Undertake practical engineering skills (acquired through laboratories, workshops, design, etc.) and show evidence of team-working, project participation and leadership abilities.
B2. Demonstrate use of engineering analysis in order to interpret problems, assess technologies, propose solutions, implement processes and enable continuous improvement.
B3. Create and develop viable products, processes and systems and ensure fitness for purpose.
B4. Apply appropriate resources, methods, tools and processes used within engineering practice.

C1. Compare, select and apply appropriate quantitative science and engineering tools to the analysis of multi-dimensional problems.
C2. Demonstrate creative and innovative ability in synthesising solutions and in formulating designs.
C3. Analyse the broader engineering picture and thus work with an appropriate level of detail.
C4. Develop, monitor and update an engineering plan in an appropriate operating environment.

D1. Develop transferable skills that will be of value in a wide range of situations, including problem-solving; communication; and working with others.
D2. Effectively use information technology to develop information retrieval skills with critical analysis.
D3. Plan and develop self-learning to improve performance as the foundation for lifelong learning and continuing professional development.
D4. Monitor and adjust a personal programme of work on an on-going basis to learn independently.

**Appendix 2**

## Programme Specification – MEng (Hons) Aerospace Engineering with Pilot Studies

**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** | *Royal Aeronautical Society (RAeS)*<br>*(Accreditation is currently being sought.)*<br>*Institution of Mechanical Engineers (IMechE)*<br>*(Accreditation is currently being sought.)* |
| **5. Title of Final Award** | MEng (Hons) Aerospace Engineering with Pilot Studies.<br>MEng (Hons) Aerospace Engineering with Pilot Studies (with Industrial Placement). |
| **6. Modes of Attendance offered** | Full Time<br>Part Time |
| **7a) UCAS Code** | AP10 |
| **7b) JACS Code** | H400 |
| **7c) HECoS Code** | 100115 |
| **8. Relevant Subject Benchmarking Group(s)** | QAA Engineering |
| **9. Other external influences** | UK Engineering Council (EC-UK)<br>QAA Academic Infrastructure |
| **10. Date of production/revision of this form** | March 2019 |

| **11. Aims of the Programme** |
|---|
| • Develop knowledge, understanding and skills necessary for successful careers in aerospace engineering, commercial aviation and for continuous professional development. |
| • Develop the intellectual, practical and team-working skills to (a) identify, interpret and analyse engineering problems, (b) postulate, develop and assess possible solutions and (c) select, justify and deliver optimised solutions. |
| • Develop relevant personal skills to take responsibility for individual learning and development. |
| • Develop skills in the use of computing, planning and problem-solving methods, as well as the practice of effective communication. |

- Meet the needs of industry and satisfy the accreditation requirements of professional engineering institutions.
- (***Specific to MEng***) Develop knowledge, understanding and skills necessary for technical leadership and specialisation. This includes Air Transport Pilots Licence theory for roles within commercial aviation.
- (***Specific to Industrial Placement***) Experience the practice of engineering in industry and the operation of engineering companies.

## 12. Learning Outcomes, Teaching, Learning and Assessment Methods

### A. Knowledge and Understanding

A1. Demonstrate extensive knowledge and understanding of essential facts, concepts, theories and principles of aerospace engineering, and its underpinning science and mathematics.

A2. Describe in-depth the wider multidisciplinary engineering context and its underlying principles.

A3. Apply the fundamental concepts of the social, environmental, ethical, economic and commercial considerations affecting the exercise of engineering judgement.

A4. Demonstrate the ability to research, learn and critically discuss new theories, concepts, methods etc. in unfamiliar situations and applications.

**Teaching and Learning Methods**

| | |
|---|---|
| Lectures, Seminars and Tutorials | A1, A2, A3 |
| Active Learning | A3, A4 |
| Practical Sessions | A1 |
| Supervised Workshops | n/a |
| Project Reviews | A1, A2 |

**Assessment methods**

| | |
|---|---|
| Written Exam | A1, A2 |
| Coursework | A1, A2, A3 |
| Practical Assessment | A1, A2, A3 |

### B. Subject-specific skills

B1. Undertake extensive practical engineering skills (acquired through laboratories, workshops, design, etc.) and show evidence of team-working, project participation and leadership abilities.

B2. Demonstrate systematic use of advanced engineering analysis in order to interpret problems, assess technologies, propose solutions, implement processes and enable continuous improvement.

B3. Create and develop viable products, processes and systems and ensure fitness for purpose.

B4. Apply appropriate resources, methods, tools and processes used within engineering practice.

**Teaching and Learning Methods**

| | |
|---|---|
| Lectures, Seminars and Tutorials | B2, B4 |
| Active Learning | B2 |
| Practical Sessions | B1, B4 |
| Supervised Workshops | B1, B3 |
| Project Reviews | B1 |

**Assessment methods**

| | |
|---|---|
| Written Exam | B2 |
| Coursework | B1, B2, B3, B4 |
| Practical Assessment | B1, B3 |

### C. Thinking Skills

C1. Compare, select and apply appropriate quantitative science and engineering tools to the analysis of multi-dimensional problems.

C2. Demonstrate creative and innovative ability in synthesising advanced solutions and in formulating designs.

C3. Analyse the broader engineering picture and thus work with an appropriate level of detail.

C4. Develop, monitor and update an engineering project plan in an appropriate operating environment.

**Teaching and Learning Methods**

| | |
|---|---|
| Lectures, Seminars and Tutorials | C1 |
| Active Learning | C2 |
| Practical Sessions | C1 |

| | |
|---|---|
| Supervised Workshops | n/a |
| Project Reviews | C3, C4 |
| **Assessment methods** | |
| Written Exam | C1 |
| Coursework | C2, C3, C4 |
| Practical Assessment | C1 |

**D. Other skills relevant to employability and personal development**

D1. Develop transferable skills that will be of value in a wide range of situations, including problem-solving; communication; and working with others.

D2. Effectively use information technology to develop information retrieval skills with critical analysis.

D3. Plan and develop self-learning skills to improve performance as the foundation for lifelong learning and continuing professional development as a professional engineer.

D4. Monitor and adjust a personal programme of work on an on-going basis using recognised engineering management processes to learn independently.

| | |
|---|---|
| **Teaching and Learning Methods** | |
| Lectures, Seminars and Tutorials | D1, D3, D4 |
| Active Learning | n/a |
| Practical Sessions | D2 |
| Supervised Workshops | n/a |
| Project Reviews | D1 |
| **Assessment methods** | |
| Written Exam | n/a |
| Coursework | D3, D4 |
| Practical Assessment | D1, D2 |

| **13. Programme Structures** | | | | **14. Awards and Credits** |
|---|---|---|---|---|
| **Level** | **Module Code** | **Module Title** | **Credit Rating** | |
| Level 7 | EI 4000<br>EI 4060<br>EI 4070<br>MP 4580 | Aerospace Group Project (C)<br>Pilot Studies ATPL Part 1 (COMP)<br>Pilot Studies ATPL Part 2 (COMP)<br>Engineer and Society (COMP) | 40<br>30<br>30<br>20 | **MEng (Hons) Aerospace Engineering with Pilot Studies**<br>480 credits including 220 credits at Level 6 or above and 120 credits at Level 7.<br>**MEng (Hons) Aerospace Engineering with Pilot Studies (with Industrial Experience)**<br>480 credits including 220 credits at Level 6 or above and 120 credits at Level 7.<br>Industrial placement route requires successful completion of EI3999 which has a notional credit of 120 credit. |
| Level 6 | EI 3000<br>EI 3010<br>EI 3030<br>EI 3040<br>MP 3604<br>MP 3732<br><br><br><br><br>EI 3999 | Individual Project (C)<br>Aircraft Design and Stability (COMP)<br>Aeromechanics (COMP)<br>Aerospace Propulsion (COMP)<br>Advanced CAD (COMP)<br>Operations Management B (COMP)<br><br><br><br><br>Industrial Placement (O) | 20<br>20<br>20<br>20<br>20<br>20<br><br><br><br><br>120 | **BEng (Hons) Aerospace Engineering with Pilot Studies**<br>360 credits including 220 credits at Level 5 or above and 100 credits at Level 6 or above.<br>**BEng Aerospace Engineering with Pilot Studies**<br>320 credits including 180 credits at Level 5 or above and 60 credits at Level 6 or above.<br>**BEng (Hons) Aerospace Engineering with Pilot Studies (with Industrial Placement)**<br>360 credits including 220 credits at Level 5 or above and 100 credits at Level 6 or above.<br>**BEng Aerospace Engineering with Pilot Studies (with Industrial Placement)** |

| | | | | |
|---|---|---|---|---|
| | | | | 320 credits including 180 credits at Level 5 or above and 60 credits at Level 6 or above.<br>Industrial placement route requires successful completion of EI3999 which has a notional credit of 120 credit. |
| Level 5 | EI 2040<br><br>EI 2910<br>MP 2576<br>EI 2030<br>SC 2153 | Aircraft Design, Systems and Manufacture (COMP)<br>Structures and FEA (COMP)<br>Thermofluids (COMP)<br>Pilot Operations PPL (COMP)<br>Further Engineering Mathematics and Simulation (COMP) | 40<br><br>20<br>20<br>20<br>20 | **Diploma of Higher Education Aerospace Engineering with Pilot Studies**<br>240 credits including 100 credits at Level 5 or above. |
| Level 4 | ER 1631<br>ER 1020<br>ER 1030<br>ER 1010 | Aerospace Vehicles (COMP)<br>Engineering Design (COMP)<br>Engineering Science (COMP)<br>Engineering Analysis (COMP) | 30<br>30<br>30<br>30 | **Certificate of Higher Education**<br>120 credits including 100 credits at Level 4 or above. |
| Level 3 | ERC001<br>ERC002<br>ERC003<br><br>ERC004<br>ERC005<br>ERC006 | Study Skills (COMP)<br>Basic Mathematics (COMP)<br>Information and Communications Technology (COMP)<br>Practical Skills (COMP)<br>Design Studies (COMP)<br>Analytical Studies (COMP) | 20<br>20<br>20<br><br>20<br>20<br>20 | **Foundation Entry**<br>Requires completion of 120 credits at Level 3. Students who exit after the Foundation year will receive a transcript of their modules and grades. |

Note: (C) for Core, (COMP) for Compulsory and (O) for Optional

## 15. Personal Development Planning

Professional development is an integral part of the course and includes sessions on personal qualities, self-management, effective communication and academic assessments, as well as professional and career management.

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EI 3000 Individual Project
EI 4000 Aerospace Group Project

This guidance is reinforced by the academic advisor system. Each student will be allocated to a named lecturer who will act as an academic advisor for all years of study.

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Programme Specifications include minimum entry requirements, including academic qualifications, together with appropriate experience and skills required for entry to study. These criteria may be expressed as a range rather than a specific grade. Amendments to entry requirements may have been made after these documents were published and you should consult the University's website for the most up to date information. Students will be informed of their personal minimum entry criteria in their offer letter.

Our typical offer is 120 **UCAS** Points including Maths and Physics at B. We operate a flexible admissions policy and treat everyone as an individual. This means that we will take into consideration your educational

achievements and predicted grades (where applicable) together with your application as a whole, including work experience and personal statement. General Studies accepted.

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**Pass Access Course:** 122 UCAS Points
**International Baccalaureate:** Pass Diploma with 122 UCAS points from Higher Level Subjects
**IELTS:** 6.0 with no score lower than 5.5
**GCSE:** 5 at grade C/4 including Maths & English or equivalent.

**17. Key sources of information about the programme**

- **Internal**
  http://www.uclan.ac.uk/courses/meng_aerospace_engineering.php

- **External**
  http://www.engc.org.uk/professional-qualifications/standards/uk-spec
  http://www.qaa.ac.uk/en/Publications/Documents/Subject-benchmark-statement-Engineering-.pdf
  http://www.qaa.ac.uk/publications/information-and-guidance
  http://www.aerosociety.com/Assets/Docs/Membership/AccreditationHandbook.pdf
  http://www.imeche.org/docs/default-source/tapd/acd001-annex-1-academic-accreditation-guidelines.doc?sfvrsn=4

## 18. Curriculum Skills Map

| Level | Module Code | Module Title | Core (C), Compulsory (COMP) or Option (O) | Programme Learning Outcomes | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Knowledge and understanding | | | | Subject-specific Skills | | | | Thinking Skills | | | | Other Skills | | | |
| | | | | *Ticks in boxes indicate that **Learning Outcomes** are being **assessed explicitly*** | | | | | | | | | | | | | | | |
| | | | | A1 | A2 | A3 | A4 | B1 | B2 | B3 | B4 | C1 | C2 | C3 | C4 | D1 | D2 | D3 | D4 |
| LEVEL 7 | EI 4000 | Aerospace Group Project | C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | EI 4060 | Pilot Studies ATPL Part 1 | COMP | ✓ | | | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ |
| | EI 4070 | Pilot Studies ATPL Part 2 | COMP | ✓ | | | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ |
| | MP4580 | Engineer and Society | COMP | ✓ | ✓ | ✓ | | | | ✓ | ✓ | | | ✓ | | ✓ | | ✓ | |
| LEVEL 6 | EI 3000 | Individual Project | C | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| | EI 3010 | Aircraft Design and Stability | COMP | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | | |
| | EI 3030 | Aeromechanics | COMP | ✓ | | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| | EI 3040 | Aerospace Propulsion | COMP | ✓ | | | | | ✓ | | ✓ | ✓ | | | | | ✓ | | |
| | EI 3999 | Industrial Placement | O | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| | MP3604 | Advanced CAD | COMP | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | |
| | MP3732 | Operations Management B | COMP | ✓ | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | |
| LEVEL 5 | EI 2040 | Aircraft Design, Systems and Manufacture | COMP | ✓ | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| | EI 2910 | Structures and FEA | COMP | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | |
| | MP2576 | Thermofluids | COMP | ✓ | | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | |
| | SC2153 | Further Engineering Mathematics and Simulation | COMP | ✓ | | | | ✓ | ✓ | ✓ | ✓ | | ✓ | | | | ✓ | ✓ | |
| | EI2030 | Pilot Studies PPL | COMP | ✓ | | | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ |
| LEVEL 4 | ER1631 | Aerospace Vehicles | COMP | ✓ | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ | |
| | ER1030 | Engineering Science | COMP | ✓ | | ✓ | | | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ | |
| | ER1020 | Engineering Design | COMP | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | | | ✓ | ✓ | | |
| | ER1010 | Engineering Analysis | COMP | ✓ | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | | | ✓ | ✓ | | |

## 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.

For example, for a standard BA/BSc (Hons) award the exit award learning outcomes for CertHE (Level 4) and DipHE (Level 5), BA/BSc (Level 6) should be included; for a postgraduate Masters, this would normally be PGDip and PGCert (Level 7).

**Learning outcomes for the award of: CertHE**

A1. Demonstrate knowledge and understanding of basic facts, concepts, theories and principles of aerospace engineering, and its underpinning science and mathematics.
A2. Describe some aspects of the wider multidisciplinary engineering context and its underlying principles.
A4. Demonstrate the ability to learn new theories, concepts, methods etc. in unfamiliar situations.

B1. Undertake practical engineering skills (acquired through laboratories, workshops, design, etc.).
B2. Attempt in the use of engineering analysis in order to interpret problems, assess technologies, propose solutions and implement processes.
B4. Apply appropriate resources, methods, tools and processes used within engineering practice.

C1. Apply appropriate quantitative science and engineering tools to the analysis of problems.
C2. Demonstrate some level of creative and innovative ability in synthesising solutions and in formulating designs.

D1. Develop some transferable skills that will be of value in a wide range of situations, including problem-solving and communication.
D2. Effectively use some aspects of information technology and information retrieval skills.

**Learning outcomes for the award of: DipHE**

A1. Demonstrate knowledge and understanding of many aspects of essential facts, concepts, theories and principles of aerospace engineering, and its underpinning science and mathematics.
A2. Describe many aspects of the wider multidisciplinary engineering context and its underlying principles.
A3. Apply some of the fundamental concepts of the social, environmental, ethical, economic and commercial considerations affecting the exercise of engineering judgement.
A4. Demonstrate the ability to learn and critically discuss to an appropriate level new theories, concepts, methods etc. in unfamiliar situations and applications.

B1. Undertake practical engineering skills (acquired through laboratories, workshops, design, etc.) and show evidence of team-working, project participation and leadership abilities.
B2. Demonstrate systematic use of engineering analysis in order to interpret problems, assess technologies, propose solutions, implement processes and enable continuous improvement.
B3. Create and develop some aspects of viable products, processes and systems and ensure fitness for purpose.
B4. Apply appropriate resources, methods, tools and processes used within engineering practice.

C1. Select and apply appropriate quantitative science and engineering tools to the analysis of multi-dimensional problems.
C2. Demonstrate an appropriate level of creative and innovative ability in synthesising solutions and in formulating designs.
C3. Analyse the broader engineering picture and thus work with an appropriate level of detail.
C4. Develop, monitor and update aspects of an engineering plan in an appropriate operating environment.

D1. Develop many transferable skills that will be of value in a wide range of situations, including problem-solving; communication; and working with others.
D2. Effectively use information technology to develop information retrieval skills with critical analysis.
D3. Plan and develop self-learning to improve performance as the foundation for lifelong learning and continuing professional development.
D4. Monitor and adjust some aspects of a personal programme of work on an on-going basis to learn independently.

**Learning outcomes for the award of: BEng**

A1. Demonstrate knowledge and understanding of most aspects of essential facts, concepts, theories and principles of aerospace engineering, and its underpinning science and mathematics.
A2. Describe the wider multidisciplinary engineering context and its underlying principles.
A3. Apply most of the fundamental concepts of the social, environmental, ethical, economic and commercial considerations affecting the exercise of engineering judgement.
A4. Demonstrate the ability to research, learn and critically discuss new theories, concepts, methods etc. in unfamiliar situations and applications.

B1. Undertake practical engineering skills (acquired through laboratories, workshops, design, etc.) and show evidence of team-working, project participation and leadership abilities.
B2. Demonstrate use of engineering analysis in order to interpret problems, assess technologies, propose solutions, implement processes and enable continuous improvement.
B3. Create and develop viable products, processes and systems and ensure fitness for purpose.
B4. Apply appropriate resources, methods, tools and processes used within engineering practice.

C1. Compare, select and apply appropriate quantitative science and engineering tools to the analysis of multi-dimensional problems.
C2. Demonstrate creative and innovative ability in synthesising solutions and in formulating designs.
C3. Analyse the broader engineering picture and thus work with an appropriate level of detail.
C4. Develop, monitor and update an engineering plan in an appropriate operating environment.

D1. Develop transferable skills that will be of value in a wide range of situations, including problem-solving; communication; and working with others.
D2. Effectively use information technology to develop information retrieval skills with critical analysis.
D3. Plan and develop self-learning to improve performance as the foundation for lifelong learning and continuing professional development.
D4. Monitor and adjust a personal programme of work on an on-going basis to learn independently.

**Learning outcomes for the award of: BEng (Hons)**

A1. Demonstrate knowledge and understanding of essential facts, concepts, theories and principles of aerospace engineering, and its underpinning science and mathematics.
A2. Describe the wider multidisciplinary engineering context and its underlying principles.
A3. Apply the fundamental concepts of the social, environmental, ethical, economic and commercial considerations affecting the exercise of engineering judgement.
A4. Demonstrate the ability to research, learn and critically discuss new theories, concepts, methods etc. in unfamiliar situations and applications.

B1. Undertake practical engineering skills (acquired through laboratories, workshops, design, etc.) and show evidence of team-working, project participation and leadership abilities.
B2. Demonstrate use of engineering analysis in order to interpret problems, assess technologies, propose solutions, implement processes and enable continuous improvement.
B3. Create and develop viable products, processes and systems and ensure fitness for purpose.
B4. Apply appropriate resources, methods, tools and processes used within engineering practice.

C1. Compare, select and apply appropriate quantitative science and engineering tools to the analysis of multi-dimensional problems.
C2. Demonstrate creative and innovative ability in synthesising advance solutions and in formulating designs.
C3. Analyse the broader engineering picture and thus work with an appropriate level of detail.
C4. Develop, monitor and update an engineering project plan in an appropriate operating environment.

D1. Develop transferable skills that will be of value in a wide range of situations, including problem-solving; communication; and working with others.
D2. Effectively use information technology to develop information retrieval skills with critical analysis.
D3. Plan and develop self-learning to improve performance as the foundation for lifelong learning and continuing professional development.
D4. Monitor and adjust a personal programme of work on an on-going basis using recognised engineering management processes to learn independently.