



## **Programme Specification**

### **Aerospace Engineering with Pilot Studies {Foundation}**

**[Frenchay]**

Version: 2022-23, v0,

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## Section 1: Key Programme Details

### Part A: Programme Information

**Programme title:** Aerospace Engineering with Pilot Studies {Foundation} [Frenchay]

**Highest award:** BEng (Hons) Aerospace Engineering with Pilot Studies

**Interim award:** BEng Aerospace Engineering with Pilot Studies

**Interim award:** DipHE Aerospace Engineering with Pilot Studies

**Interim award:** CertHE Aerospace Engineering with Pilot Studies

**Awarding institution:** UWE Bristol

**Affiliated institutions:** Not applicable

**Teaching institutions:** UWE Bristol

**Study abroad:** Yes

**Year abroad:** No

**Sandwich year:** Yes

**Credit recognition:** No

**School responsible for the programme:** FET Dept of Engineering Design & Mathematics, Faculty of Environment & Technology

**Contributing schools:** Not applicable

**Professional, statutory or regulatory bodies:** Not applicable

**Apprenticeship:** Not applicable

**Mode of delivery:** Full-time, Sandwich

**Entry requirements:** For the current entry requirements see the UWE public website.

**For implementation from:** 01 September 2020

**Programme code:** H49400

## Section 2: Programme Overview, Aims and Learning Outcomes

### Part A: Programme Overview, Aims and Learning Outcomes

**Overview:** The curriculum is designed for students seeking an engineering education closely aligned to engineering practice. Technical knowledge, engineering practice, business awareness and sustainability are integrated through projects and revisited to produce confident graduates able to apply their skills to novel situations and create engineering solutions that benefit society.

Professional development is placed at the heart of the curriculum. From day one, students are taken on a journey from student engineer to graduate engineer, preparing them for life as an engineering professional. Students will identify, develop and demonstrate competencies expected of a professional engineer in the workplace. Projects and activities, embedded throughout the curriculum, are designed to develop the engineering habits of mind such as: Problem-finding, Problem-solving, Improving, Adapting, and Systems and Critical Thinking. Foundation principles of engineering science, skills and practice are integrated throughout all years of study.

Aerospace engineers are predominantly employed throughout the aerospace, aviation and the wider technical sector in the design, manufacture and improvement of aerospace vehicles, integrated systems, and associated operations. Consequently, aerospace engineering graduates need to be able to integrate engineering knowledge skills from across engineering and be able to be an effective member of a multidisciplinary team. Aerospace engineering topics including systems design, engineering analysis, materials, structures, stress analysis and manufacturing, aerodynamics, thermofluids, flight and propulsion are developed throughout the core modules and taken an advanced level in the optional modules. Approaches commonly found in the Aerospace industry such as flight simulation, systems engineering, safety management systems and have been included in the core programme of study.

Pilot studies element of the programme answers to the needs of the growing airline industry, which, despite periodic declines, tends to be a future of contemporary transportation. A complete ground school training towards the Private Pilot License is included in the ICAO PPL Ground School module. In the third year of the programme students are introduced to the pilot's role in the airline business. The minimum required practical flight training experience from the student when graduated is 20 hours. However, we encourage to complete their licenses and higher ratings.

The ability to work in multidisciplinary teams on projects that require a broader view of the role of engineering in industry and society is developed through the core programme using project weeks to bring students together in problem finding and solution spaces where students are able to interact with each other as a team, under the supervision of academics and external practitioners.

The integration of knowledge, skills and practice allows the tackling of real engineering challenges and encourage students to engage with the wider role that aerospace engineers and specifically engineering habits of mind can play in tackling global challenges. This is an accessible and modern engineering curriculum designed to attract students from diverse backgrounds able to see the future role of engineering in industry and society.

The Foundation Year entry route provides the opportunity for students to enter the programme from an academic background that is different to that normally required for the study of engineering undergraduate programmes.

**Educational Aims:** As a result of successful completion of this programme, a student will

Be able to work as a graduate Aerospace engineer across the engineering sector as an effective member of a multidisciplinary team.

Have acquired the knowledge and understanding of scientific principles and methods necessary to underpin an education in engineering. The programme will provide

insight into, and practical skills in, the design, operation manufacture and improvement of complex aerospace vehicles and will explore the environmental impact of engineering.

Have demonstrated an ability to integrate their knowledge and understanding of core subject material in order to solve a substantial range of engineering problems, including ones of a complex nature either individually or as part of a team.

Have developed and demonstrated understanding of the competencies and social responsibilities required by a professional engineer in the workplace and society. Activities to scaffold this development are embedded throughout the core curriculum to develop the engineering habits of mind. As a consequence, students will be able to critically appraise the value and effectiveness of future engineering innovations in the field in terms of business improvement and environmental sustainability.

Have the requisite academic knowledge, skills and preparation for progression to study for higher degrees in appropriate engineering disciplines.

### **Programme Learning Outcomes:**

On successful completion of this programme graduates will achieve the following learning outcomes.

### **Programme Learning Outcomes**

- PO1. Understand, identify and demonstrate the role and professional values of the engineer in industry, including upholding legal, ethical, health and safety requirements.
- PO2. Apply mathematical and scientific principles, concepts and theories appropriate to aerospace engineering, as a method for formulating, assessing and communicating solutions for complex problems
- PO3. Model aerospace vehicles, components and systems using analytical, numerical and experimental techniques, compatible with industrial practice
- PO4. Evaluate the manufacturing, financial, marketing implications of design proposals developed

- PO5. Apply an integrated or systems approach, and established and novel engineering analysis concepts to solve complex aerospace engineering problems
- PO6. Communicate and operate effectively either as members of inter-disciplinary or multi-disciplinary teams; managing time and resources to given constraints
- PO7. Pursue independent study, undertake enquiry into novel and unfamiliar concepts and implement change in an engineering environment.
- PO8. Make considered judgements and decisions on complex engineering issues in which not all facts and consequences are accurately known.

## Part B: Programme Structure

### Year 1

Full-time and Sandwich students must take 120 credits from the modules in Year 1.

#### Year 1 Compulsory Modules (Full-time and Sandwich)

Full-time and Sandwich students must take 120 credits from the modules in Compulsory Modules (Full-time and Sandwich).

Module Code	Module Title	Credit
UFMFEG-30-0	Engineering Experimentation 2022-23	30
UFMFHG-15-0	Foundation Group Project 2022-23	15
UFMFBG-30-0	Foundation Mathematics: Algebra and Calculus 2022-23	30
UFMFAG-30-0	Foundation Mechanics 2022-23	30
UFMF CG-15-0	Introduction to Mechatronics 2022-23	15

### Year 2

Full-time and Sandwich students must take 120 credits from the modules in Year 2.

#### Year 2 Compulsory Modules (Full-time and Sandwich)

Full-time and Sandwich students must take 120 credits from the modules in Compulsory Modules (Full-time and Sandwich).

<b>Module Code</b>	<b>Module Title</b>	<b>Credit</b>
UFMFQU-15-1	Aerospace Thermofluids 2023-24	15
UFMFMS-30-1	Dynamics Modelling and Simulation 2023-24	30
UFMFKS-30-1	Engineering Practice 1 2023-24	30
UFMF8W-15-1	Introduction to Pilot Studies 2023-24	15
UFMFSL-30-1	Solid Mechanics, Materials and Manufacturing 2023-24	30

**Year 3**

Full-time and Sandwich students must take 120 credits from the modules in Year 3.

**Year 3 Compulsory Modules (Full-time and Sandwich)**

Full-time and Sandwich students must take 120 credits from the modules in Compulsory Modules (Full-time and Sandwich).

<b>Module Code</b>	<b>Module Title</b>	<b>Credit</b>
UFMFSS-15-2	Aerospace Systems Design 2024-25	15
UFMFQS-15-2	Engineering Practice 2 2024-25	15
UFMFRS-15-2	Engineering Research 2024-25	15
UFMFFK-15-2	Flight 2024-25	15
UFMFTU-15-2	Fundamental Aero-Propulsion 2024-25	15
UFMFRK-15-2	Fundamental Aerodynamics 2024-25	15
UFMFSS-30-2	Structural Mechanics 2024-25	30

**Year 4**

Full-time students must take 120 credits from the modules in Year 4.

Sandwich students must take 15 credits from the modules in Year 4.

**Year 4 Compulsory Modules (Full-time)**

Full-time students must take 90 credits from the modules in Compulsory Modules (Full-time).

<b>Module Code</b>	<b>Module Title</b>	<b>Credit</b>
UFMFUU-15-3	Aerospace Group Design Project 2025-26	15
UFMFX8-30-3	Engineering Project 2025-26	30
UFMFAW-30-3	Pilot and Airline Operations 2025-26	30
UFMFNQ-15-3	Professionalism for Engineers 2025-26	15

**Year 4 Compulsory Modules (Sandwich)**

Sandwich students must take 15 credits from the modules in Compulsory Modules (Sandwich).

<b>Module Code</b>	<b>Module Title</b>	<b>Credit</b>
UFMF89-15-3	Industrial Placement 2025-26	15

**Year 4 Optional Modules (Full-time)**

Full-time students must take 30 credits from the modules in Optional Modules (Full-time).

<b>Module Code</b>	<b>Module Title</b>	<b>Credit</b>
UFMFVU-15-3	Aero Structures 2025-26	15
UFMFWU-15-3	Avionics 2025-26	15
UFMFU6-15-3	Composite Engineering 2025-26	15
UFMFYJ-15-3	Control Engineering 2025-26	15
UFMF7V-15-3	Digital Manufacturing in Aerospace 2025-26	15
UFMFYU-15-3	Further Aero-Propulsion 2025-26	15
UFMFXU-15-3	Further Aerodynamics 2025-26	15



UFMFSL-15-3	Integrated Electro-Mechanical Systems 2025-26	15
UFMF8V-15-3	Space Engineering 2025-26	15
UFMFCH-15-3	Spaceflight 2025-26	15

**Year 5**

Sandwich students must take 105 credits from the modules in Year 5.

**Year 5 Compulsory Modules (Sandwich)**

Sandwich students must take 75 credits from the modules in Compulsory Modules (Sandwich).

<b>Module Code</b>	<b>Module Title</b>	<b>Credit</b>
UFMFUU-15-3	Aerospace Group Design Project 2026-27	15
UFMFX8-30-3	Engineering Project 2026-27	30
UFMFAW-30-3	Pilot and Airline Operations 2026-27	30

**Year 5 Optional Modules (Sandwich)**

Sandwich students must take 30 credits from the modules in Optional Modules (Sandwich).

<b>Module Code</b>	<b>Module Title</b>	<b>Credit</b>
UFMFVU-15-3	Aero Structures 2026-27	15
UFMFWU-15-3	Avionics 2026-27	15
UFMFU6-15-3	Composite Engineering 2026-27	15
UFMFYJ-15-3	Control Engineering 2026-27	15
UFMF7V-15-3	Digital Manufacturing in Aerospace 2026-27	15
UFMFYU-15-3	Further Aero-Propulsion 2026-27	15
UFMFXU-15-3	Further Aerodynamics 2026-27	15

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UFMFSL-15-3	Integrated Electro-Mechanical Systems 2026-27	15
UFMF8V-15-3	Space Engineering 2026-27	15
UFMFCH-15-3	Spaceflight 2026-27	15

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**Part C: Higher Education Achievement Record (HEAR) Synopsis**

Graduates of this programme will be equipped with a broad understanding of systems design, engineering analysis, materials, structures, stress analysis and manufacturing, aerodynamics, thermofluids, flight and aero-propulsion.

The programme produces graduates with an integrated or systems engineering approach to engineering problem solving. Graduates from this programme will also be equipped to work in multi-disciplinary teams, able to critically appraise existing ideas and practice and produce creative solutions to engineering problems.

**Part D: External Reference Points and Benchmarks**

QAA UK Quality Code for HE

Framework for higher education qualifications (FHEQ)

Subject benchmark statement for Higher Education qualifications in engineering (Oct 2019)

Strategy 2030

University policies

Staff research projects

Relevant PSRB requirements: AHEP3

Industrial Advisory Board

### **Part E: Regulations**

Approved variant to University Academic Regulations and Procedures

The following variant regulations have been approved by the University Regulations to comply with conditions set out by Engineering Council UK.

The degree classification for the 360 credit honours degree BEng (Hons) Aerospace Engineering with Pilot Studies (or 480 credit honours degree with an integrated foundation year) is based upon:

the best marks for 100 credits at level 3 and the best marks achieved for the next 100 credits at level 2 or above.

The calculation at level 3 must always use the full credit and mark for the level 3 project module UFMFX8-30-3 followed by the best marks associated with the remaining level 3 credits.

Where the credit size of the best marks associated with the remaining level 3 modules would give a credit total greater than 100, only the relevant portion of credit is counted. The unused credit may be counted towards the set of best marks at level 2 or above.

Marks achieved for the 100 level 3 credits are weighted three times the value of the marks for the 100 credits at level 2 or above.

The classification method for direct entrants to the BEng in Aerospace Engineering will include the marks and whole credit for the project.

Condoned Credit

Approved to variant University Academic Regulations and Procedures.

The following variant regulation for condoned credit (E4) applies to students on this award which has been accredited by a PSRB that comes under the auspices of Engineering Council UK.

The variant applied to Level 4 September 2020 intake onwards.

The permitted maximum condoned credit is 30 credits for a Bachelors or Integrated Masters degree and a maximum of 20 credits in a Masters degree.

The awarding of condoned credit may be considered for an overall module mark in the range 30% to 39%.

As a consequence Engineering Council UK regulations about the offer of excused credit for modules critical to the awarding of accreditation, excused credit will not be available on this award.