Course Specification

BEng Aerospace Technology
EECU093

Faculty of Engineering, Environment and Computing
School of Mechanical, Aerospace and Automotive Engineering
Academic Year: 2020/2021

Please note: This specification provides a concise summary of the main features of the course and the learning outcomes that a typical student might reasonably be expected to achieve and demonstrate if s/he takes full advantage of the learning opportunities that are provided.

We regularly review our course content, to make it relevant and current for the benefit of our students. For these reasons, course modules may be updated.

More detailed information on the learning outcomes, content, and teaching, learning and assessment methods of each module can be found in the Module Information Directory (MID), student module guide(s) and the course handbook.

The accuracy of the information contained in this document is reviewed by the University and may be verified by the Quality Assurance Agency for Higher Education.
PART A Course Specification
BEng Aerospace Technology

1. Introduction

This programme specification describes the BEng Aerospace Technology course at Coventry University. This course sits in the School of Mechanical, Aerospace and Automotive Engineering which has global reputation for excellent teaching, outstanding student experience and exciting research utilising state-of-the art building with modern equipment and student facilities, including a full-sized Harrier jet. The course has been running for a number of years as a degree course.

The Aerospace Technology course concentrates on Engineering Mathematics, Aircraft Systems, Control Systems, Aerodynamics, Aircraft Structures & Manufacturing, Mechanical Engineering and Engineering Management. These will give graduates a strong base from which to start professional work in aerospace design using the latest software tools. The course delivers the material in an integrated way to reflect the multi-disciplinary nature of the aerospace industry. The variety of teaching, learning and assessment strategies are designed to promote and facilitate an independent applications and implementation engineer who has the ability to work effectively, efficiently and collaboratively within an aerospace engineering company.

The programme is structured to assimilate a variety of academic backgrounds and to provide a basic grounding in the key aeronautical principles in the first year and is reinforced with the use of practical laboratory sessions using a full-sized aircraft, wind tunnel and flight simulator hardware. In the second year, the analysis and design aspects of individual aerospace systems, along with aircraft maintenance management, aerodynamics and structures, are investigated and which leads to an integrated design exercise in the third year. Employability workshops are embedded in the second year, and are delivered by the School’s award-winning placements team. The Faculty has strong links with the industry, and in the past students have gone on placements with different companies such as Collins Aerospace, MDBA, Airbus Space and Defence, Rolls-Royce, GE Aviation, BAE and Meggitt.

Upon completion of the course, graduates can expect to find employment in a variety of industries. There is a growing demand from the aerospace industry for aerospace engineers with an implementation and applications focus, and once employed there will be opportunities for an accelerated promotion through either a technical or management route who are able to embrace the multi-disciplinary aspects of aerospace engineering.

2 Available Award(s) and Modes of Study

<table>
<thead>
<tr>
<th>Title of Award</th>
<th>Mode of attendance</th>
<th>UCAS Code</th>
<th>FHEQ Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEng Aerospace Technology</td>
<td>FT 3 year</td>
<td>H402</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>SW 4 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>PT 6 years</td>
<td></td>
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</tr>
</tbody>
</table>

3 Awarding Institution/Body

Coventry University.

4 Collaboration

None

5 Teaching Institution and Location of delivery

Coventry University

6 Internal Approval/Review Dates

Date of latest review: July 2019 (Periodic Review)

7 Course Accredited by

8 Accreditation Date and Duration

9 QAA Subject Benchmark Statement(s) and/or other external factors

The Subject Benchmark Statements for Engineering are relevant to this programme. Subject Benchmark statements can be found at:
The programme is designed to provide an education appropriate to future registration with the Engineering Council as a Chartered Engineer.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td><strong><a href="http://www.qaa.ac.uk/academicinfrastructure/benchmark/default.asp">http://www.qaa.ac.uk/academicinfrastructure/benchmark/default.asp</a></strong></td>
<td></td>
</tr>
<tr>
<td><strong>10 Date of Course Specification</strong></td>
<td>September 2019</td>
</tr>
<tr>
<td><strong>11 Course Director</strong></td>
<td>Dr Shaheer Zubairi</td>
</tr>
</tbody>
</table>
12 Outline and Educational Aims of the Course

This BEng in Aerospace Technology aims to provide the students with a thorough understanding of the fundamental principles of aerospace engineering and how this knowledge is applied in the aerospace industry. The programme is centred upon applications for aerospace vehicles and is primarily based upon mechanical systems, but provides students with good knowledge of electrical and electronic engineering to be able to address the total system solution. The educational experience also aims to develop students’ intellectual and personal skills, and give them the capability to undertake practical activities relevant to the aerospace industry. This will prepare students to pursue careers and be applications and development engineering leaders in industry.

The education programme educational aims include.

- Create an educational environment that enables students to explore the current and emerging technologies, applications and digital tools used in engineering design and analysis of aerospace problems.
- To develop aerospace applications and development engineers with the skills of problem-solving, innovation, flexibility and resourcefulness to meet the changing demands of the aerospace industry, making significant contributions to the aerospace profession, the economy and society.
- Interpret aerospace engineering knowledge in operations & management and application & development of technology in appraising the critical issues and their application to continuous improvement.
- Highlight the importance of research through research-based teaching and research-based group and individual projects, underpinned by activity led learning.
- Create an educational environment that gives access to both academic and industrial experience.
- Provide students with the opportunity to deal with complex issues, demonstrate self-direction and develop transferable skills.
- Provide students with the opportunity to secure and experience an industrial engineering placement or year abroad.
- Mentor students to be professional in their outlook, be capable of team working, be effective communicators, and be able to exercise responsibility and sound management approaches
- Plan self-learning and improve performance as the foundation of lifelong learning and continuous professional development.
13 Course Learning Outcomes

On successful completion of the course a student will be able to

1. Demonstrate knowledge and understanding of scientific and mathematical principles to solve applications problems in the aerospace industry. (RAeS SM)
2. Using quantitative and computational methods, interpret the results of analysis and modelling of an aerospace application problem to recommend an appropriate action using a relevant technology. (RAeS EA)
3. Demonstrate a comprehensive understanding of design, design processes & limitations, and life cycle management in developing solutions that meet the customer requirements. (RAeS D).
4. Clearly and appropriately communicate complete solutions using both written and oral formats. (RAeS D).
5. Understand the need for professional and ethical conduct in commercial, economic and social context, by appraising the sustainable development and the regulations governing engineering activities in order to critique the risk, legal and contractual issues and intellectual property. (RAeS D, EL, P).
6. Demonstrate knowledge of a range of aerospace products, processes, materials and standards, including an awareness of quality issues and their application to continuous improvement. (RAeS P).
7. Evaluate uncertain and incomplete technical data/information and perform practical laboratory work in order to identify the impact on design. (RAeS D, P).
8. Develop independent learning and problem-solving skills appropriate to current and future study and employment. (RAeS G).
9. Apply management techniques by contributing to a team with the necessary planning, monitoring, adaptability, drive and leadership to achieve the required objectives of an aerospace-related project. (RAeS EL P, G)

14 Course Structure and Requirements, Levels, Modules, Credits and Awards

The programme may be studied in the following modes of attendance:

- Full-time over three years of study for BEng.
- Sandwich with an industrial training placement being taken for one year between the second and third years of study.
- Sandwich with a year abroad being taken between the second and third years of study at Coventry University.
- Part-time. The programme can be studied in part-time mode over a duration of 6 years by attending the modules timetabled for full-time students. Students are normally expected to study 60 credits per year.

14.1 Add+Vantage Scheme

As required by University regulations, students will take one 10 credit Add+Vantage module at each of Levels 4 – 6 of their course. The Add+Vantage scheme is a University initiative for broadening students’ studies. There is a large collection of 10 credit modules in a wide variety of areas, many linked to ‘graduateness’ and ‘employability’. The scheme includes languages, law, advanced IT and mathematical skills.
14.2 Progression through course
To progress from one stage to the next, students must normally pass all modules. Students who fail to pass sufficient modules to progress will be considered under the Academic Regulations. The outcome will be at the discretion of the Programme Assessment Board (PAB).

The following table summarises the effect of these with the course curriculum.

<table>
<thead>
<tr>
<th>Credit level</th>
<th>Module Code</th>
<th>Title</th>
<th>Credit Value</th>
<th>Mandatory/ Optional</th>
<th>Course Learning Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4021MAA</td>
<td>Fluids Mechanics and Aerodynamics</td>
<td>20</td>
<td>M</td>
<td>1, 2, 4, 7, 8, 9</td>
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<tr>
<td>4</td>
<td>4022MAA</td>
<td>Thermodynamics, Propulsion &amp; Aircraft Systems</td>
<td>20</td>
<td>M</td>
<td>1, 2, 3, 6, 7, 8, 9</td>
</tr>
<tr>
<td>4</td>
<td>4023MAA</td>
<td>Solid Mechanics &amp; Aircraft Structures</td>
<td>20</td>
<td>M</td>
<td>1, 2, 3, 6, 7, 8, 9</td>
</tr>
<tr>
<td>4</td>
<td>4024MAA</td>
<td>Introduction to CAD &amp; Professional Skills</td>
<td>10</td>
<td>M</td>
<td>3, 4, 6, 8, 9</td>
</tr>
<tr>
<td>4</td>
<td>4038CEM</td>
<td>Engineering Mathematics 1</td>
<td>20</td>
<td>M</td>
<td>1, 2, 8</td>
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<tr>
<td>4</td>
<td>4066CEM</td>
<td>Introduction to Aerospace Electronics</td>
<td>20</td>
<td>M</td>
<td>1, 2</td>
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<tr>
<td>4</td>
<td>Add+Vantage</td>
<td></td>
<td>10</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5011MAA</td>
<td>Aerospace Maintenance Management</td>
<td>20</td>
<td>M</td>
<td>4, 6, 8, 9</td>
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<tr>
<td>5</td>
<td>5012MAA</td>
<td>Human Factors in Aerospace</td>
<td>10</td>
<td>M</td>
<td>3, 4, 6, 8</td>
</tr>
<tr>
<td>5</td>
<td>5013MAA</td>
<td>Aircraft Aerodynamics</td>
<td>20</td>
<td>M</td>
<td>1, 2, 4, 7, 8</td>
</tr>
<tr>
<td>5</td>
<td>5014MAA</td>
<td>Avionics and Instrumentation</td>
<td>20</td>
<td>M</td>
<td>1, 2, 4, 6, 8</td>
</tr>
<tr>
<td>5</td>
<td>5015MAA</td>
<td>Aerospace Structural Analysis</td>
<td>20</td>
<td>M</td>
<td>2, 3, 4, 6, 7, 9</td>
</tr>
<tr>
<td>5</td>
<td>5016MAA</td>
<td>Aircraft Systems</td>
<td>20</td>
<td>M</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9</td>
</tr>
<tr>
<td>5</td>
<td>Add+Vantage</td>
<td></td>
<td>10</td>
<td>M</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>5012CEM</td>
<td>Professional Training</td>
<td>0</td>
<td>O</td>
<td>4, 8</td>
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<tr>
<td>5</td>
<td>5013CEM</td>
<td>Study Abroad</td>
<td>0</td>
<td>O</td>
<td>4, 8</td>
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<tr>
<td>6</td>
<td>6010MAA</td>
<td>Individual Project Introduction</td>
<td>10</td>
<td>M</td>
<td>3, 4, 5, 6, 8</td>
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<tr>
<td>6</td>
<td>6020MAA</td>
<td>Individual Aerospace Project</td>
<td>20</td>
<td>M</td>
<td>1, 2, 3, 4, 5, 6, 7, 8</td>
</tr>
<tr>
<td>6</td>
<td>6011MAA</td>
<td>Aerospace Project Management - Concept and Prototyping</td>
<td>20</td>
<td>M</td>
<td>1, 3, 4, 5, 6, 7, 8, 9</td>
</tr>
<tr>
<td>6</td>
<td>6012MAA</td>
<td>Aerospace Project Management - Test, Operations &amp; Realisation</td>
<td>20</td>
<td>M</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9</td>
</tr>
<tr>
<td>6</td>
<td>6013MAA</td>
<td>Introduction to Control and Real Time Applications</td>
<td>20</td>
<td>M</td>
<td>1, 3, 4, 8</td>
</tr>
<tr>
<td>6</td>
<td>6014MAA</td>
<td>Aerospace Technology</td>
<td>20</td>
<td>M</td>
<td>1, 2, 3, 4, 5, 6, 7, 8, 9</td>
</tr>
<tr>
<td>6</td>
<td>Add+Vantage</td>
<td></td>
<td>10</td>
<td>M</td>
<td></td>
</tr>
</tbody>
</table>

14.3 Professional Training or Study Abroad and the award of Sandwich degrees
Students may undertake a year out in industry or a year studying abroad with support of the Erasmus exchange scheme, between Levels 5 and 6 of their course. Students will be enrolled onto relevant modules which they must take and pass to achieve a Sandwich (SW) degree (5012CEM) or a Full Time with Study Abroad (FY) degree (5013CEM).
14.4 Conditions for the award of an honours degree

The award of an Honours or Unclassified degree from this course requires a student to achieve the minimum module counts specified in the University General Regulations Honours classification is based on the calculation method described in the University Academic Regulations. Furthermore, 6010MAA, 6020MAA, and three modules from 6011MAA, 6012MAA, 6013MAA and 6014MAA must be used in the classification calculation to obtain the BEng (Hons) Aerospace Technology degree.

14.5 Conditions for fall back award

Students failing to meet the award requirements of the BEng Honours or BEng Aerospace Technology programme will be considered for alternative awards for which they satisfy the credit score count and mandatory module pass requirements. Specifically: unnamed Diploma of Higher Education and unnamed Certificate of Higher Education. The requirements for these awards are as specified in the University Academic Regulations.

The requirements for the awards of BEng Aerospace Technology, Diploma of Higher Education and Certificate of Higher Education are specified in the University Academic Regulations.

Cascade of Awards:

BEng (Hons) Aerospace Technology
(360 credits)
↓
BEng Aerospace Technology
(300 credits with 60 credits which must include 6010MAA, 6020MAA, 6011MAA, 6012MAA, 6013MAA or 6014MAA.)
↓
Diploma of Higher Education
(240 credits)
↓
Certificate of Higher Education
(120 credits)
Criteria for Admission and Selection Procedure

UCAS entry profiles may be found at http://www.ucas.ac.uk.

Candidates for admission to the programme will normally be expected to:

a) Satisfy the general admission requirements of the University as specified in the Academic Regulations. This requires achieving 5 GCSE passes at Grade C or above including Maths and English, or equivalent qualifications.

b) Demonstrate a competence to study using the English Language. For overseas entrants the English language requirement is IELTS grade 6 or equivalent.

c) Meet the academic entry requirements to the programme by achieving equivalent qualifications amounting to UCAS tariff points as stated above in UCAS entry profiles (or http://www.coventry.ac.uk/study-at-coventry/course-search/). Typical offers would include the following:

- A-Levels to include Mathematics and one from Physics, Chemistry, Design Technology, Further Mathematics, Electronics, Computing, ICT, Engineering or Product Design. Excludes General studies. A BTEC National Certificate or Diploma in an appropriate subject, including maths and further maths units.
- Scottish Highers and Advanced Highers, to include at least one subject from Maths, a Physical Science, Design and Technology or similar.
- Other qualifications – for details of other acceptable qualification, please see http://www.coventry.ac.uk/undergraduate

This section summarises the main admissions requirements for entry to level 1 of the programme from United Kingdom applicants. Applications involving other UK or overseas qualifications, mature candidates, or for direct entry to later levels of the programme from candidates with experience, are welcome and will be considered on their merit.

16 Academic Regulations and Regulations of Assessment

This Course conforms to the standard University Academic Regulations Undergraduate Mode E.
The following are key indicators of quality and standards:

- The programme has been designed in accordance with the relevant QAA benchmark statements, UK standards for Professional Engineering Competence and RAeS accreditation guidance for the subject and professional body requirements.

- Accreditation is sought from relevant organisations to ensure the course meets professional standards. Sections 5 and 6 detail the current accreditations held.

- The latest statistical data on the quality of the subject area, results from the National Student Survey, and typical graduate employment rates and destinations may be accessed at www.unistats.com.

- The School engages in a wide variety of research and attracts governmental funding. The School conducts themed research within three Faculty Research Centres (FRCs).

- The Transportation and Mobility Faculty Research Centre builds on our existing strengths in engine testing, modelling exhaust emissions, vehicle dynamics, fuel cell vehicle technologies and crash safety.

- The Centre for Flow Measurement and Fluid Mechanics Research (FMRC) undertakes fundamental and applied research into industrially-relevant complex flows.

- The Materials and Manufacturing Faculty Research Centre takes an integrative approach to fabrication and manufacturing, focussing on the three strands of Materials, Processes, and Products, underpinned by expertise in Metrology, Modelling, and Advanced Experimentation.

- The Institute for Advanced Manufacturing and Engineering (AME), which is supported by the Higher Education Funding Council for England’s Catalyst Fund, is a collaboration between Coventry University and Unipart Manufacturing Group. AME has built a bespoke ‘Faculty on the Factory Floor’ at Unipart’s manufacturing site in the heart of Coventry. This forms the focal point of activity and houses state-of-the-art robotic automation, forming, joining, analysis and simulation, metrology and product verification technology.

- The School has excellent links with local employers. Regular meetings of the School Advisory Board, made up of local employers, provide input to course management and development. Student projects are often informed by working with industrial and research partners.

The report of QAA’s Institutional Audit undertaken in February 2015 confirmed that Coventry University meets the UK expectations regarding:

- setting and maintenance of the academic standards of awards;
- quality of student learning opportunities;
- quality of the information about learning opportunities;
- enhancement of student learning opportunities.
18 Additional Information

Enrolled students have access to additional, key sources of information about the course and student support including,

- Faculty Student handbook
- Course Handbook
- Module Guides
- Module Information Directory
- Student Portal
- EEC Student Portal

Induction

Students engage in a series of induction events, 'Student Essentials' over the first six weeks of their programme. The Student Essentials encompass a number of academic, administrative and social events including a welcome and introduction to the university, the facilities and the faculty. As part of the Student Essentials induction events, all students are directed to an online student handbook and a course handbook, which provides key information.

Buildings and Equipment

The faculty is mainly based within two buildings, the Engineering and Computing building and the Sir John Laing building, all of which are equipped with specialist equipment to support students. This includes a high performance engineering centre which houses a full size harrier, three further simulators, a wind and smoke tunnel, civil engineering specialist testing equipment, a range of CNC machinery, a laser workshop and a 3D Geoscience Information Laboratory.

Student Support

Students will be allocated an Academic Personal Tutor who will provide on-going academic support throughout the year. Students are expected to attend regular meetings with their tutor within a timetabled group meeting. Support is also available via Course Directors, who are available to advise students on academic and pastoral issues. Times that Course Directors are available to meet with students will be shown on course Moodle webs and also their location. Module Leaders and the associated module team are available to offer support at module level. Again Module Leaders advertise their contact times on module Moodle webs and also their location. Outside of office hours, you can also email any member of academic staff.

The Faculty Registry team support you through your studies, providing information and guidance on the rules and procedures that affect your academic progress. Faculty Registry can help you deal with problems you may be having with academic life and help you understand the University's academic processes and regulations. They have a detailed understanding of the curriculum structures and other specialist support that is available to you within the University.

The Faculty Registry have offices located close to the main Student Information Points/Receptions. Students can drop by the Registry support desk which is next to reception in the ECB; Monday – Friday from 1000 – 1600. Or Students can contact Registry staff via the Reception desks in the EC building or the John Laing building; Monday – Friday from 0830 – 1700. This team can also be emailed FacultyRegistry.eec@coventry.ac.uk at any time and this will be passed to each student's dedicated course support team to respond to.

The Faculty Learning Support Co-ordinators and Learning Support Tutors work closely with the Disabilities Office in the Hub and Course Teams within the Faculty. Reasonable adjustments will be made for students with disabilities who have registered with the University as requiring additional support with their studies.

The University has an excellent record on widening access and welcomes students from all backgrounds and neighbourhoods with low participation in higher education.

Students have access to a Maths Support Centre called SIGMA based in the Library. The Centre for Academic Writing (CAW) can also provide support on topics ranging from how to organise an academic argument to improving grammar and sentence structure. The university provides support for students' health and wellbeing
which includes a Medical Centre, Spirituality and Faith Centre, Counselling and Mental Health Service, Sports and Recreational Centre and a Nursery.

The Student’s Union also provide recreational facilities, support, and advice for students. International Students may obtain further help from the student welfare team in the International Student Centre.

There is a careers service where qualified consultants are available to help students think about the issues they face as they move through University studies and prepare for employment.

Students may seek to undertake a relevant professional/international placement year between levels 5 and 6 of an undergraduate degree, this opportunity is encouraged to provide students with the depth of experience that such an opportunity affords. Assistance with acquiring a relevant placement is offered by the Faculty’s Placement Team – EEC Futures. Within each School there is also an Industrial Placement Tutor who will be identified to you during your course.

Library – There is also additional support for all students learning within the Lanchester Library. The library hosts both physical books, administers central access to electronic resources (e-books and electronic journals) as well as document supply (obtaining books or journal articles from other universities).

**Flying Start**

Students will be provided with core text books and/or other materials in support of their course as part of the ‘Flying Start’ project.