Course Specification

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Produced By:	Oliver Jones
Status:	Validated

Core Information

Awarding Body / Institution:	University of Wolverhampton		
School / Institute:	School of Engineering		
Course Code(s):	MA004Q01UV MA004Q31UV	Full-time Part-time	4 Years 8 Years
Course Title:	MEng (Hons) Aerospace Engineering		
Hierarchy of Awards:	Master in Engineering with Honours Aerospace Engineering Bachelor of Engineering with Honours Aerospace Engineering Bachelor of Engineering Aerospace Engineering Diploma of Higher Education Aerospace Engineering Certificate of Higher Education Engineering University Statement of Credit University Statement of Credit		
Language of Study:	English		
Date of DAG approval:	12/May/2017		
Last Review:	2019/0		
Course Specification valid from:	2014/5		
Course Specification valid to:	2024/5		

Academic Staff

Course Leader:	David Adebayo
Head of Department:	Dr Syed Hasan

Course Information

Location of Delivery:	University of Wolverhampton
Category of Partnership:	Not delivered in partnership
Teaching Institution:	University of Wolverhampton
Open / Closed Course:	This course is open to all suitably qualified candidates.

Entry Requirements:

Entry requirements are subject to regular review. The entry requirements applicable to a particular academic year will be published on the University website (and externally as appropriate e.g. UCAS

2017 Entry

GCSE English and Maths and a Technology or Science-based subject at grade C+/4 or above (or equivalent)

Plus Either

- A Level minimum of A*A or BCC to include Maths and either a Technology or Science-based subject, or equivalent qualification(s)
- BTEC QCF Extended Diploma grade DMM, BTEC QCF Diploma grade D*D
- If you've got other qualifications or relevant experience, please contact The Gateway for further advice before applying.
- International entry requirements and application guidance can be found here
- Successful completion of the International Foundation Year in Science and Engineering guarantees entry on to this course

Other Requirements

Students must have studied a minimum of two years post GCSE level. However, it is expected that some applicants will be mature students with work experience, who wish to further their career development. These applicants will be processed through standard procedures, which may involve an interview as part of the process. Please see http://wlv.ac.uk/mature for further information.

Those who do not meet the entry requirements may be offered an alternative course.

Distinctive Features of the Course:

The School of Engineering specialises in the integration of the mechanical, electrical, and electronics subject areas. The MEng Aerospace Engineering course reflects this emphasis and, in addition to gaining in-depth knowledge and understanding of the aerospace subject, students also gain experience of designing engineering systems that incorporate aspects of the mechanical and electrical/electronic technologies.

You will use industry-standard software to facilitate design, analysis and synthesis activities; you will be taught by lecturers who have substantial industrial experience in an environment focused on working with, and supporting engineering and technology companies.

The students will also benefit from the schools USP's and the integration into the curriculum of practical work & analysis, mimicking the working environment of post education. Club activities are used to offer kinesthetic outlets for students wishing to place themselves ahead of competition by giving real experience while studying, these traits make the Aerospace Engineering course unique within the sector and when combined with the large local industry, offer graduates real future potential. In addition this is a 3 +1 style integrated masters.

You will participate in a multi-disciplinary group project, necessitating the application of advanced

management techniques in a progressive technological environment.

Educational Aims of the Course:

The overall aim of this course is to ensure graduates have a comprehensive engineering education combined with specialist knowledge of aerospace engineering, as recognised in the professional engineering community by an accredited degree. This ensures that graduates are equipped with the appropriate knowledge and enterprising spirit to practise professionally and ethically. Thus, the course will:

- address industry's demand for graduates who can apply the principles of aerospace engineering to the analysis and synthesis of products and systems across the aerospace engineering sector
- enable students to pursue professional careers in aerospace engineering at a level which requires the exercise of sound judgement, and initiative, and the ability to make informed decisions in complex and unpredictable circumstances that reflect a responsible, ethical, and socially aware outlook
- furnish students with a detailed understanding of the principles of aerospace engineering, combining and considering all its associated facets, enabling the rational selection of the most appropriate technology mix to solve engineering problems
- encourage practical, intellectual and transferable skills in aerospace engineering to be demonstrated through a staff lead club activities, being personally micro-managed at student level
- develop a fundamental core of knowledge, understanding and practical skills at an appropriate level to permit the bearer to apply taught theory to industrially relevant project work
- require students to participate in a group project where the project team members are drawn from a range of cognate engineering disciplines
- develop the ability to research unfamiliar subject areas in mechanical engineering and cognate disciplines, thereby enhancing the creative aspects of engineering design and innovation.

Intakes:

September

Major Source of Funding:

Office for Students (OFS)

Tuition Fees:

Tuition fees are reviewed on an annual basis. The fees applicable to a particular academic year will be published on the University website.

Year	Status	Mode	Amount
2020/1	H	Full Time / Sandwich	£9250.00
2020/1	Overseas	Full Time / Sandwich	£12250.00
2020/1	H	Part Time	£3050.00
2020/1	Overseas	Part Time	£6125.00

PSRB:

None

Course Structure:

September (Full-time)

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

Year 1

Module	Title	Credits	Period	Type
4MA007	Engineering Mathematics	20	SEM1	Core
4MA008	Engineering Science	20	SEM1	Core
4MA009	Computer Aided Design	20	SEM1	Core
4MA010	Aerospace Principles	20	SEM2	Core
4MA028	Engineering Experimentation	20	SEM2	Core
4MA029	Industrial Design Project	20	SEM2	Core

September (Full-time)

Year 2

Module	Title	Credits	Period	Type
5MA034	Engine Design and Thermodyhamics	20	SEM1	Core
5MA044	Applied Instrumentation and Control	20	SEM1	Core
5MA035	Aircraft Systems and Avionics	20	SEM2	Core
5MA037	Materials Science and Manufacturing	20	SEM2	Core
5MA038	Enterprising Group Innovation Project	40	YEAR	Core

September (Full-time)

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

Year 3

Module	Title	Credits	Period	Type
6MA041	Supersonic and Subsonic Aerodynamics	20	SEM1	Core
6MA039	Aerospace Composite and FEA	20	SEM2	Core
6MA036	ESEE - Economic, Social, Ethical and Environmental	20	SEM2	Core
6MA037	Human Factors and Cockpit Ergonomics	20	SEM1	Core
6MA038	Individual Innovation Project	40	YEAR	Core

September (Full-time)

Part time students study alongside full time students. However, they do not study more than 80 credits in each academic calendar year.

Year 4

Module	Title	Credits	Period	Type
7MA021	Flight Dynamics and Control	20	INYR	Core
7ET014	Computational Fluid Dynamics (CFD) and Heat Transfer	20	INYR	Core
7MA024	Advanced Aerospace Propulsion Systems	20	INYR	Core
7MA010	Business Management & Accounting	20	INYR	Core
7MA027	Group Research Project	20	INYR	Core

Please note: Optional modules might not run every year, the course team will decide on an annual basis which options will be running, based on student demand and academic factors, to create the best learning experience.

Learning, Teaching and Assessment

Academic Regulations Exemption:

In situations where Professional Body and University regulations differ, the respective Professional Body (IET) regulation will have precedent over the exempted University regulation;

Section 1.2.5 - Exemption to permit less than 33% differentiation (mainly at Level 4 and Level 5) between the majority of named undergraduate Engineering degree programmes.

Section 4.4.1 - Exemption in accordance with Institution of Engineering and Technology (IET) requirements. Compensation will be limited to no more than 20 credits at each level of study and maximum of 40 credits overall. There is no compensation permitted for independent study or postgraduate modules. Deferment of a project submission date at Level 6 or Level 7 is allowed only for exceptional reasons and for a maximum of three months.

APPROVED (by Chair's Action on 11/7/2019).

Section 4.5.8 - Exemption permitting MEng students to progress from Level 6 to Level 7 of their integrated masters qualifications with a minimum lower second class degree classification.

Section 5.4.1 - Exemption to use all Level 5, Level 6 and Level 7 module grades excluding placement modules (assessed using a Pass/Fail marking scheme) to contribute towards overall MEng classifications with aggregated weightings at each level of study as follows;

Level	Weighting
4	-
5	20%
6	30%
7	50%

Students who fail the MEng qualification at Level 7 will be eligible to receive the BEng qualification achieved at Level 6. For students being admitted directly at Level 6, on degrees which do not have professional accreditation, student degree classifications are based upon the average of all Level 6 and Level 7 modules according to weightings listed below as follows;

Level	Weighting
4	-
5	-
6	50%
7	50%

For accredited programmes, the PSRB will assess the educational qualifications of an applicant for either IEng or CEng status based upon the receipt of a certified transcript from the University Registry (and with the applicant's authorisation).

APPROVED on 17/5/2018.

Reference Points:

The following PSRB and QAA subject benchmarks have been consulted in the development of learning outcomes of this course, thereby ensuring that the academic requirements of the appropriate PSRB, The Institution of Mechanical Engineers (IMechE)) are addressed:

- Engineering Council UK-SPEC 2015
- Accreditation of Higher Education programmes (AHEP).

Learning Outcomes:

CertHE Course Learning Outcome 1 (CHECLO1)

Demonstrate knowledge of the underlying concepts and principles associated with your area(s) of study, and an ability to evaluate and interpret these within the context of that area of study

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CertHE Course Learning Outcome 2 (CHECLO2)

Demonstrate an ability to present, evaluate and interpret qualitative and quantitative data, in order to develop lines of argument and make sound judgements in accordance with basic theories and concepts of your subject(s) of study.

CertHE Course Learning Outcome 3 (CHECLO3)

Evaluate the appropriateness of different approaches to solving problems related to your area(s) of study and/or work

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CertHE Course Learning Outcome 4 (CHECLO4)

Communicate the results of your study/work accurately and reliably, and with structured and coherent arguments

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CertHE Course Learning Outcome 5 (CHECLO5)

Demonstrate the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility

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DipHE Course Learning Outcome 1 (DHE#CLO1)

Demonstrate knowledge and critical understanding of the well-established principles of your area(s) of study, and of the way in which those principles have developed with an understanding of the limits of your knowledge, and how this influences analyses and interpretations based on that knowledge.

DipHE Course Learning Outcome 2 (DHE#CLO2)

Demonstrate the ability to apply underlying concepts and principles outside the context in which they were first studied, including, where appropriate, the application of those principles in an employment context

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DipHE Course Learning Outcome 3 (DHE#CLO3)

Demonstrate knowledge of the main methods of enquiry in the subject(s) relevant to the named award, and ability to evaluate critically the appropriateness of different approaches to solving problems in the field of study

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DipHE Course Learning Outcome 4 (DHE#CLO4)

Use a range of established techniques to initiate and undertake critical analysis of information, and to propose solutions to problems arising from that analysis

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DipHE Course Learning Outcome 5 (DHE#CLO5)

Effectively communicate information, arguments and analysis in a variety of forms to specialist and non-specialist audiences, and deploy key techniques of the discipline effectively

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DipHE Course Learning Outcome 6 (DHE#CLO6)

Demonstrate the qualities and transferable skills necessary for employment, requiring the exercise of personal responsibility and decision-making and undertake further training, developing existing skills and acquire new competences that will enable them to assume significant responsibility within organisations

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Ordinary Degree Course Learning Outcome 1 (ORD#CLO1)

Design, analyse and synthesise aerospace engineering products, systems, and processes to demonstrate an innovative and creative approach to design realisation.

Ordinary Degree Course Learning Outcome 2 (ORD#CLO2)

Analyse and evaluate a range of solutions appropriate to aerospace engineering problems, drawn from a broad range of engineering and technology specialities with an ability to adapt theories or methods to solve unfamiliar problems.

Ordinary Degree Course Learning Outcome 3 (ORD#CLO3)

Select and apply appropriate mathematical and scientific methods to solve problems in the analysis and synthesis of aerospace engineering systems and products.

Ordinary Degree Course Learning Outcome 4 (ORD#CLO4)

Contribute to teamwork effectively and ethically, addressing prominent aerospace concepts, considering also the wider aspects of social, environmental, ethical, commercial, legal, and enterprise issues through the effective management, communication, policy integration, standard-compliance, planning and self-learning.

Ordinary Degree Course Learning Outcome 5 (ORD#CLO5)

Select and apply appropriate software packages along with relevant professional codes for design, analysis, and synthesis of aerospace engineering systems to critically reflect and communicate the results with appropriate levels of detail.

Ordinary Degree Course Learning Outcome 6 (ORD#CLO6)

Relate theory and practice to the recognition of processes and products thereby facilitating the efficient realisation of viable aerospace engineering products, systems and processes.

Honours Degree Course Learning Outcome 1 (DEG#CLO1)

Design, analyse and synthesise aerospace engineering products, systems, and processes to demonstrate an innovative and creative approach to design realisation.

Honours Degree Course Learning Outcome 2 (DEG#CLO2)

Analyse and evaluate a range of solutions appropriate to aerospace engineering problems, drawn from a broad range of engineering and technology specialities with an ability to adapt theories or methods to solve unfamiliar problems.

Honours Degree Course Learning Outcome 3 (DEG#CLO3)

Select and apply appropriate mathematical and scientific methods to solve problems in the analysis and synthesis of aerospace engineering systems and products.

Honours Degree Course Learning Outcome 4 (DEG#CLO4)

Contribute to teamwork effectively and ethically, addressing prominent aerospace concepts, considering also the wider aspects of social, environmental, ethical, commercial, legal, and enterprise issues through the effective management, communication, policy integration, standard-compliance, planning and self-learning.

Honours Degree Course Learning Outcome 5 (DEG#CLO5)

Select and apply appropriate software packages along with relevant professional codes for design, analysis, and synthesis of aerospace engineering systems to critically reflect and communicate the results with appropriate levels of detail.

Honours Degree Course Learning Outcome 6 (DEG#CLO6)

Relate theory and practice to the recognition of processes and products thereby facilitating the efficient realisation of viable aerospace engineering products, systems and processes.

Honours Degree Course Learning Outcome 7 (DEG#CLO7)

Validate, manage and implement a research study in your discipline and effectively disseminate the findings that arise.

Integrated Masters Course Learning Outcome 1 (IMA#CLO1)

Generate creative solutions to aerospace engineering problems and demonstrate an innovative approach to design realisation.

Integrated Masters Course Learning Outcome 2 (IMA#CLO2)

Effectively research unfamiliar subject areas within aerospace engineering and related disciplines to propose and evaluate a broad range of solutions to engineering problems.

Integrated Masters Course Learning Outcome 3 (IMA#CLO3)

Demonstrate a critical awareness of mathematical and scientific principles to solve problems in the analysis

and synthesis relevant to aerospace engineering and the ability to evaluate them critically and to apply them effectively in engineering projects.

Integrated Masters Course Learning Outcome 4 (IMA#CLO4)

Take professional responsibility for teams of engineers effectively and ethically addressing the prominent engineering, social, legal, environmental, commercial and enterprise issues surrounding current and emerging high level aerospace engineering challenges.

Integrated Masters Course Learning Outcome 5 (IMA#CLO5)

Utilise and apply appropriate software packages for the design, analysis and synthesis of aerospace engineering applications and critically evaluate and communicate the results with personal reflection.

Integrated Masters Course Learning Outcome 6 (IMA#CLO6)

Relate materials and components to theory and practice thereby facilitating the efficient realisation of viable aerospace engineering products and systems, considering commercial and industrial constraints.

Overview of Assessment:

Module	Title	Course Learning Outcomes
4MA007	Engineering Mathematics	CHECLO2, CHECLO3, CHECLO5
4MA008	Engineering Science	CHECLO2, CHECLO3
4MA009	Computer Aided Design	CHECLO1, CHECLO4, CHECLO5
4MA010	Aerospace Principles	CHECLO1, CHECLO2, CHECLO3
4MA028	Engineering Experimentation	CHECLO2, CHECLO5
4MA029	Industrial Design Project	CHECLO1, CHECLO2, CHECLO3, CHECLO4, CHECLO5
5MA034	Engine Design and Thermodyhamics	DHE#CLO1, DHE#CLO2, DHE#CLO3, DHE#CLO4, DHE#CLO6
5MA035	Aircraft Systems and Avionics	DHE#CLO1, DHE#CLO2, DHE#CLO3, DHE#CLO6
5MA037	Materials Science and Manufacturing	DHE#CLO1, DHE#CLO2, DHE#CLO3, DHE#CLO6
5MA038	Enterprising Group Innovation Project	DHE#CLO1, DHE#CLO2, DHE#CLO3, DHE#CLO4, DHE#CLO5, DHE#CLO6
5MA044	Applied Instrumentation and Control	DHE#CLO2, DHE#CLO3
6MA036	ESEE - Economic, Social, Ethical and Environmental	DEG#CLO4, DEG#CLO6, ORD#CLO4, ORD#CLO6
6MA037	Human Factors and Cockpit Ergonomics	DEG#CLO1, DEG#CLO4, DEG#CLO6, ORD#CLO1, ORD#CLO4, ORD#CLO6
6MA038	Individual Innovation Project	DEG#CLO1, DEG#CLO2, DEG#CLO3, DEG#CLO4, DEG#CLO5, DEG#CLO6, DEG#CLO7, ORD#CLO1, ORD#CLO2, ORD#CLO3, ORD#CLO4, ORD#CLO5, ORD#CLO6
6MA039	Aerospace Composite and FEA	DEG#CLO1, DEG#CLO2, DEG#CLO3, DEG#CLO6, ORD#CLO1, ORD#CLO2, ORD#CLO3, ORD#CLO6
6MA041	Supersonic and Subsonic Aerodynamics	DEG#CLO1, DEG#CLO2, DEG#CLO3, DEG#CLO6, ORD#CLO1, ORD#CLO2, ORD#CLO3, ORD#CLO6
7ET014	Computational Fluid Dynamics (CFD) and Heat Transfer	IMA#CLO2, IMA#CLO3, IMA#CLO6
7MA010	Business Management & Accounting	IMA#CLO2, IMA#CLO3, IMA#CLO5, IMA#CLO6
7MA021	Flight Dynamics and Control	IMA#CLO1, IMA#CLO2, IMA#CLO3, IMA#CLO4, IMA#CLO5, IMA#CLO6
7MA024	Advanced Aerospace Propulsion Systems	IMA#CLO1, IMA#CLO2, IMA#CLO3, IMA#CLO4
7MA027	Group Research Project	IMA#CLO1, IMA#CLO2, IMA#CLO3, IMA#CLO4, IMA#CLO5, IMA#CLO6

Teaching, Learning and Assessment:

The following learning activities support the achievement of the course learning outcomes:

1. Reading – core and supplementary texts, journals and electronic sources
2. Club activities, human powered flight (aerospace) however all activities will be available to students on this course
3. Group activities aimed at developing team-working skills in a multi-disciplinary environment
4. Preparing written presentations; both analytically and textually based
5. Oral presentations; both group and individual
6. Lectures and laboratory sessions
7. Group and individual tutorials

8. Engaging in informed discussion with fellow students and academic staff in tutorials and seminars
9. Information retrieval from articles, journals and books for assessments
10. Problem-based learning techniques, e.g. design projects, case studies
11. Providing solutions to meet real world problems/requirements
12. Solving closed and open ended problems
13. Using computer software and hardware to model and simulate products and engineering systems
14. Engaging in informed discussion with fellow students and academic staff in tutorials
15. Student led presentations
16. Researching articles, journals and books for assessments
17. Applying systematic methods to develop (novel) solutions
18. Coursework reports (technical and discursive)
19. Preparing for unseen examinations
20. Writing Project dissertation
21. Critical examination of data
22. Working within accepted guidelines
23. Simulation and problem solving exercises
24. Use vortex learning via the core projects each year to challenge and extend learning
25. Use of industrially placed guest lectures to enhance both learning experience but also employability
26. Use of industrially placed ex-students to give insight into job roles post education.

Assessment Methods:

At the University of Wolverhampton, a variety of modes of assessment will be used to support and test your learning and progress and to help you develop capabilities that are valued beyond your University studies and into your working life. Your course may include a variety of assessment activities:

Written examinations (including online examinations, open and closed book examinations and quizzes)
Coursework (for example, essays, reports, portfolios, project proposals and briefs, CVs, poster presentation)
Practical (for example, oral and video presentations, laboratory work, performances, practical skills assessment)

In the final year of your undergraduate degree, and at the end of your postgraduate degree, you are likely to be expected to write an extended piece of work or research, such as a dissertation or a practice-based piece of research.

Student Support:

Enhanced learning support is provided in the following areas:

1. Support for mathematics and analytic-based modules via the Mathematics software package

2. Face-to-face tutorial sessions in mathematics

3. Report writing and oral/presentation communications skills

4. Learning centre – literature searches and information searches

5. Practical/lab/experimental activities and reporting

6. Research for project work (major individual & group work at M-level, plus group assignments at L5/6)

7. Promotion of *independent learning* during tutorials, face-to-face sessions.

University provided support:

As well as providing general counselling support the University Counselling Service provides short courses on topics such as "Self Confidence", "Stress Management and Relaxation" and "Life Skills". They also provide study skills and academic support, providing short courses such as provide help in areas such as "Writing and Assignment Skills", "Exam Techniques", "Enhancing Professional Skills", "Personal Development Planning"

and "Making Choices for the Future."

In addition to the subject knowledge that you will gain from studying on your course, there are opportunities available to develop a range of skills that will help with your academic work; such academic skills include giving presentations, group work, academic writing, referencing and time management (specific help for maths is also available). The Learning and Skills Team in Learning and Information Services (LIS) offer year-round academic skills support and guidance to all students. Students who are new to academic study and unsure of how to get started, or any student who wants to improve on their academic performance can attend drop-in sessions and workshops, or obtain advice via email or Skype. More details about how the Learning and Skills Team can help you are available at; http://www.wlv.ac.uk/skills

Employability in the Curriculum:

The combination of engineering skills, design capability, and management provides graduates of this course with a wide range of employment opportunities in technical environments across the world.

Aerospace engineers may choose industrially based careers in research and development, test, systems, product development, performance and development engineering, aerospace component, and design engineering. They go on to co-ordinate product, process and system design; and manage technical projects in a wide range of technical environments.

Graduates may also study for a taught postgraduate degree, MSc, or a research degree, MPhil/PhD.

The transferable skills gained during the course, including: project management, group working, and analytical thinking, also enable a graduate to pursue careers in non-technical fields such as: law, accountancy, authoring, and computing, expanded as per below;

Engineering / intellectual Skills

- Analyse a range of systems to meet testing, maintenance and design objectives
- Apply competently a range of testing, measurement, design and project management techniques
- Use effectively relevant engineering software tools
- Apply engineering techniques within industrial and commercial constraints

Transferable Skills

- Use analytical skills and relevant software tools for the analysis and presentation and communication of engineering and business data.
- Demonstrate effective interpersonal skills and self-management
- Manage time and resources within a team to meet commercial and engineering objectives
- Contribute to the effective management of design, production, and quality activities and project development in an industrial environment.