Course Specification

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Core Information

Awarding Body / Institution:	University of Wolverhampton		
School / Institute:	School of Engineering		
Course Code(s):	MA008Q01UV MA008Q31UV	Full-time Part-time	4 Years 8 Years
Course Title:	MEng (Hons) Mechatronics Engineering		
Hierarchy of Awards:	Master in Engineering with Honours Mechatronics Engineering Bachelor of Engineering with Honours Mechatronics Engineering Bachelor of Engineering Mechatronics Engineering Diploma of Higher Education Mechatronics Engineering Certificate of Higher Education Engineering University Statement of Credit University Statement of Credit		
Language of Study:	English		
Date of DAG approval:	24/May/2017		
Last Review:	2019/0		
Course Specification valid from:	2014/5		
Course Specification valid to:	2024/5		

Academic Staff

Course Leader:	NADER ANANI
Head of Department:	Dr Aman Dhir

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

- A Level minimum of A*A* or BBC to include Mathematics and a Technology or Science based-subject
- BTEC National Diploma grade DMM
- BTEC QCF Extended Diploma grade DMM, BTEC QCF Diploma grade D*D*
- Applicants will normally be expected to hold GCSE English and Maths at grade C+/4 or equivalent
- Applicants holding/studying an Access to HE Diploma may be considered on an individual basis.
- 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 BSc(Hons) Science and Engineering with Foundation Year guarantees entry on to this course
- 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 Department of Engineering and Technology specialises in the integration of the mechatronics engineering and electrical/electronic engineering disciplines. The BEng Mechatronics Engineering course reflects this emphasis and, in addition to gaining in-depth knowledge and understanding of the mechatronics engineering subject, students also gain experience of designing engineering systems that incorporate aspects of the mechatronics and electrical/electronic technologies.

You will be using industry-standard software. In addition to experimental work at the University you will use Radar equipment at the Cosford Royal Air Force base - the same equipment used to train Air Force personnel.

You will be taught by lecturers who have a wealth of industrial experience in an environment focused on working with, and supporting engineering and technology companies.

The BEng (Hons) Mechatronics Engineering course is one of a small number of accredited courses that you can undertake as either a full-time or part-time (day-release) student, thus providing all graduates with equal recognition.

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 mechatronics engineering 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 integrate the principles and applications of mechatronics engineering, and apply them to the analysis and synthesis of engineering products and systems across the engineering sector
- enable students to pursue professional careers in the mechatronics engineering field 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 electrical engineering, electronics and mechanical engineering science, enabling the rational selection of the most appropriate approach to solve engineering problems
- engender a top-down, systems approach to the analysis, synthesis and realisation of mechatronics products and systems.
- provide a broadly based education in electrical engineering, electronics, mechanical engineering and design allowing scope for entry into a wide range of disciplines within the engineering field.
- 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 mechatronics engineering and cognate disciplines, thereby enhancing the creative aspects of engineering design and innovation
- require the application of the knowledge and skills, in an appropriate industrial environment, thereby broadening the student's knowledge of industrial procedures and practices.

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
2021/2	H	Full Time / Sandwich	£9250.00
2021/2	Overseas	Full Time / Sandwich	£12950.00
2021/2	H	Part Time	£3100.00
2022/3	H	Full Time / Sandwich	£9250.00
2022/3	Overseas	Full Time / Sandwich	£13450.00
2022/3	H	Part Time	£3120.00

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.

Module	Title	Credits	Period	Type
4MM029	Engineering Mathematics I	20	SEM1	Core
4MA008	Engineering Science	20	SEM1	Core
4MA009	Computer Aided Design	20	SEM1	Core
4MA020	Electromechanical Engineering Principles	20	SEM2	Core
4MM028	Engineering Mathematics II	20	SEM2	Core
4MA029	Industrial Design Project	20	SEM2	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.

Module	Title	Credits	Period	Type
5MA042	Digital Systems and Embedded Computing	20	SEM1	Core
5MA037	Materials Science and Manufacturing	20	SEM2	Core
5MA044	Applied Instrumentation and Control	20	SEM1	Core
5MA038	Enterprising Group Innovation Project	40	YEAR	Core
5MA041	Signal Processing	20	SEM2	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.

Module	Title	Credits	Period	Type
6MA036	ESEE - Economic, Social, Ethical and Environmental	20	SEM2	Core
6MA016	Structural Mechanics and Stress Analysis	20	SEM2	Core
6MA048	Mechatronic System Design	20	SEM1	Core
6MA049	Automation and Control	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.

Module	Title	Credits	Period	Type
7MA020	Design Optimation and Simulation	20	SEM1	Core
7MA026	Robotics: Sensors and Control	20	SEM1	Core
7MA028	Condition Monitoring and Control Engineering	20	SEM2	Core
7MA010	Business Management & Accounting	20	SEM2	Core
7MA027	Group Research Project	40	YEAR	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:

UK Quality Code for Higher Education https://www.qaa.ac.uk/quality-code

UK Quality Code for Higher Education Advice & Guidance https://www.qaa.ac.uk/en/quality-code/advice-and-guidance

Subject Benchmark Statements https://www.qaa.ac.uk/en/quality-code/subject-benchmark-statements

Qualifications and Credit Frameworkshttps://www.qaa.ac.uk/en/quality-code/qualifications-and-credit-frameworks

Overview of Assessment:

As part of the course approval process, the course learning outcomes were mapped to each of the modules forming the diet of the programme of study. This process confirmed that all course learning outcomes can be met through successful completion of the modules. This mapping applies to the final award as well as to all of the intermediate awards.

Learning Outcomes	Modules
01 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	
02 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.

Learning Outcomes	Modules
03 Evaluate the appropriateness of different approaches to solving problems related to your area(s) of study and/or work	
04 Communicate the results of your study/work accurately and reliably, and with structured and coherent arguments	
05 Demonstrate the qualities and transferable skills necessary for employment requiring the exercise of some personal responsibility	
IMAH01 Design, analyse and synthesise mechatronics engineering products, systems, and processes to demonstrate an innovative and creative approach to design realisation.	
IMAH02 Analyse and evaluate a range of solutions appropriate to mechatronics engineering, drawn from a broad range of engineering and technology specialities with an ability to adapt theories or methods to solve unfamiliar problems.	
IMAH03 Select and apply appropriate mathematical and scientific methods to solve problems in the analysis and synthesis of mechatronics engineering systems.	
IMAH04 Contribute to teamwork effectively and ethically, addressing prominent mechatronics 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.	
IMAH05 Select and apply appropriate software packages along with relevant professional codes for design, analysis, and synthesis of mechatronics engineering systems to critically reflect and communicate the results with appropriate levels of detail.	
IMAH06 Relate theory and practice to the recognition of processes and products thereby facilitating the efficient realisation of viable mechatronics engineering products, systems and processes.	
IMAH07 Validate, manage and implement a research study in your discipline and effectively disseminate the findings that arise.	
01 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.	
02 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	
03 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	
04 Use a range of established techniques to initiate and undertake critical analysis of information, and to propose solutions to problems arising from that analysis	

Learning Outcomes	Modules
05 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	
06 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	
IMAH01 Generate creative solutions to mechatronics engineering problems and demonstrate an innovative approach to realisation of mechatronic products and systems.	
IMAH02 Effectively research unfamiliar subject areas within mechatronics engineering and related disciplines to propose and evaluate a broad range of solutions to engineering problems.	
IMAH03 Demonstrate a critical awareness of mathematical and scientific principles to solve problems in the analysis and synthesis relevant to mechatronics engineering and the ability to evaluate them critically and to apply them effectively in engineering projects.	
IMAH04 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 mechatronics engineering challenges.	
IMAH05 Utilise and apply appropriate software packages for the design, analysis and synthesis of mechatronics engineering applications and critically evaluate and communicate the results with personal reflection.	
IMAH06 Relate materials and components to theory and practice thereby facilitating the efficient realisation of viable mechatronics engineering products and systems, considering commercial and industrial constraints.	
01 Design, analyse and synthesise mechatronics engineering products, systems, and processes to demonstrate an innovative and creative approach to design realisation.	
02 Analyse and evaluate a range of solutions appropriate to mechatronics engineering, drawn from a broad range of engineering and technology specialities with an ability to adapt theories or methods to solve unfamiliar problems.	
03 Select and apply appropriate mathematical and scientific methods to solve problems in the analysis and synthesis of mechatronics engineering systems.	
04 Contribute to teamwork effectively and ethically, addressing prominent mechatronics 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.	
05 Select and apply appropriate software packages along with relevant professional codes for design, analysis, and synthesis of mechatronics engineering systems to critically reflect and communicate the results with appropriate levels of detail.	
06 Relate theory and practice to the recognition of processes	

and products thereby facilitating the efficient realisation of viable mechatronics engineering products, systems and processes.

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. Group activities aimed at developing team-working skills in a multi-disciplinary environment
3. Preparing written presentations; both analytically and textually based
4. Oral presentations; both group and individual
5. Lectures and laboratory sessions
6. Group and individual tutorials
7. Engaging in informed discussion with fellow students and academic staff in tutorials and seminars
8. Information retrieval from articles, journals and books for assessments
9. Problem-based learning techniques, e.g. design projects, case studies
10. Providing solutions to meet real world problems/requirements
11. Solving closed and open ended problems
12. Using computer software and hardware to model and simulate products and engineering systems
13. Engaging in informed discussion with fellow students and academic staff in tutorials
14. Student led presentations
15. Researching articles, journals and books for assessments
16. Applying systematic methods to develop (novel) solutions
17. Coursework reports (technical and discursive)
18. Preparing for unseen examinations
19. Writing Project dissertation
20. Critical examination of data
21. Working within accepted guidelines
22. Simulation and problem solving exercises.

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 Mathletics 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 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 Mechatronics subject area provides career opportunities in a broad spectrum of industrial activities, as well as offering a gateway to all levels in the education sector. Mechatronics graduates have followed career paths as diverse as research and development within aerospace companies through to secondary school teaching. In the contemporary industrial environment, the approach to problem solving, design, and research and development activities is to form multidisciplinary teams, thereby ensuring that all avenues are explored and evaluated. The Mechatronics engineer is well placed in this structure, since the ethos of the subject is broad based. The course enables graduates to attain management positions, with significant levels of responsibility within a relatively short time. Graduates may also study for a taught postgraduate degree, MSc, or a research degree, MPhil/PhD, within the Department.

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.