Course Specification

Published Date:	23-Oct-2020
Produced By:	Oliver Jones
Status:	Validated

Core Information

Awarding Body / Institution:	University of Wolverhampton		
School / Institute:	School of Engineering		
Course Code(s):	MA027P01UV MA027P31UV	Full-time Part-time	12 Months 2 Years
Course Title:	MSc Mechanical Engineering		
Hierarchy of Awards:	Master of Science Mechanical Engineering Postgraduate Diploma Mechanical Engineering Postgraduate Certificate Mechanical Engineering Postgraduate Certificate Mechanical Engineering University Statement of Credit University Statement of Credit		
Language of Study:	English		
Date of DAG approval:	06/Jun/2019		
Last Review:	2018/9		
Course Specification valid from:	2018/9		
Course Specification valid to:	2024/5		

Academic Staff

Course Leader:	Dr Peter Wardle
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

Students should normally be educated to honours degree level, with a minimum of a 2.2, in Mechanical Engineering, Technology or a closely related discipline.

RPL will be granted, if appropriate, as part of the admissions process and then ratified by the FSE RPL committee. All non-standard applicants to this course will be dealt with on a case-by-case basis. In this instance, substantial professional experience can substitute for graduate status.

All first-degree qualifications in General Engineering and Physical Sciences (B Eng and B Sc) will be considered.

Normal University of Wolverhampton criteria for English will apply to students admitted to this course. This being IELTS 6 minimum or equivalent.

Distinctive Features of the Course:

New teaching facilities are an integral part of a recent £10m investment at the University of Wolverhampton's Telford Innovation Campus, which meets the teaching and learning requirements of students on this MSc course. All the specialist equipment needed for the delivery of the course including Solid Mechanics and Fluid Mechanics laboratories, Subsonic and Supersonic Wind Tunnels, Advanced Materials and Composites Analysis and Advanced Additive Manufacturing Engineering Facilities, already exist. The course will be underpinned by high quality teaching, highly experienced and qualified members of academic staff who are at the cutting-edge of research in their respective fields.

The course has been developed according to the UK Engineering Council's benchmark requirements for professional engineering, to ensure that our students enter the workforce with the broad expertise and relevant capabilities that employers' value.

Educational Aims of the Course:

his innovative MSc course provides an advanced understanding of Mechanical Engineering with the aim to produce postgraduates with the versatility and depth of understanding to deal with new and exciting challenges in Engineering, alongside the necessary imagination and creativity to innovate. Balancing academic theory with practical considerations, this course covers key areas of mechanical sciences, such as Stress Analysis, Computational Fluid Dynamics and Heat Transfer, along with Product Design, Advanced Materials, Research Methods and Computer Aided Engineering.

A principal component of the course is the dissertation project, which is usually associated with current research activity or industrial consultancy in the School of Engineering, allowing students to gain substantial expertise in one specific area.

You will pay attention to the development of investigative, modelling and computational strategies. This will

allow you to acquire advanced knowledge and a systematic understanding of contemporary finite element modelling techniques to analyse the behaviour of complex engineering systems and components. It will allow you to develop a comprehensive understanding of advanced solid mechanics, fluid mechanics and other analytical techniques pertinent to product development, manufacture and sustainability, and to apply these techniques to synthesise novel designs for a range of engineering applications.

Intakes:

September
January

Major Source of Funding:

OTHER FUNDING

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	£6400.00
2020/1	Overseas	Full Time	£13350.00
2020/1	H	Part Time	£3200.00

PSRB:

None

Course Structure:

January (Full-time)

Year 1

Module	Title	Credits	Period	Type
7ET014	Computational Fluid Dynamics (CFD) and Heat Transfer	20	INYR	Core
7ET032	Applied Stress Analysis	20	INYR	Core
7CM003	CAD and Product Definition	20	INYR	Core
7ET023	Dissertation	60	CRYRA	Core

January (Part-time)

Year 1

Module	Title	Credits	Period	Type
7ET014	Computational Fluid Dynamics (CFD) and Heat Transfer	20	INYR	Core
7CM003	CAD and Product Definition	20	INYR	Core
7ET022	Research Methods and Professional Skills	20	INYR	Core
7MA020	Design Optimation and Simulation	20	INYR	Core
7MA018	Advanced Materials and Manufacturing Processes	20	INYR	Core
7ET022	Research Methods and Professional Skills	20	INYR	Core
7MA020	Design Optimation and Simulation	20	INYR	Core

January (Part-time)

Year 2

Module	Title	Credits	Period	Type
7ET032	Applied Stress Analysis	20	INYR	Core
7ET023	Dissertation	60	CRYRA	Core
7MA018	Advanced Materials and Manufacturing Processes	20	INYR	Core

September (Full-time)

Year 1

Module	Title	Credits	Period	Type
7ET022	Research Methods and Professional Skills	20	INYR	Core
7MA020	Design Optimation and Simulation	20	INYR	Core
7MA018	Advanced Materials and Manufacturing Processes	20	INYR	Core
7ET014	Computational Fluid Dynamics (CFD) and Heat Transfer	20	INYR	Core
7ET032	Applied Stress Analysis	20	INYR	Core
7CM003	CAD and Product Definition	20	INYR	Core
7ET023	Dissertation	60	CRYRA	Core

September (Part-time)

Year 1

Module	Title	Credits	Period	Type
7ET022	Research Methods and Professional Skills	20	INYR	Core
7MA020	Design Optimation and Simulation	20	INYR	Core
7ET014	Computational Fluid Dynamics (CFD) and Heat Transfer	20	INYR	Core
7CM003	CAD and Product Definition	20	INYR	Core

September (Part-time)

Year 2

Module	Title	Credits	Period	Type
7MA018	Advanced Materials and Manufacturing Processes	20	INYR	Core
7ET032	Applied Stress Analysis	20	INYR	Core
7ET023	Dissertation	60	CRYRA	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:

N/A

Reference Points:

UK Quality Code for Higher Education

Qualifications and Credit Frameworks

Subject Benchmark Statements

University Policies and Regulations

Accreditation of Higher Education Programmes (AHEP) – Engineering Council

Equality Act (2010)

Learning Outcomes:

PGCert Course Learning Outcome 1 (PGCCLO1)

Demonstrate a systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of your academic discipline, field of study or area of professional practice with a conceptual understanding that enables the student: a) to evaluate critically current research and advanced scholarship in the discipline b) to evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses.

PGCert Course Learning Outcome 2 (PGCCLO2)

Demonstrate a comprehensive understanding of techniques applicable to your own research or advanced scholarship and ability to continue to advance your knowledge and understanding, and to develop new skills to a high level.

PGCert Course Learning Outcome 3 (PGCCLO3)

Demonstrate originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline.

PGCert Course Learning Outcome 4 (PGCCLO4)

Ability to deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate your conclusions clearly to specialist and non-specialist audiences.

PGCert Course Learning Outcome 5 (PGCCLO5)

Demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level.

PGCert Course Learning Outcome 6 (PGCCLO6)

Demonstrate the qualities and transferable skills necessary for employment requiring: a) the exercise of initiative and personal responsibility b) decision-making in complex and unpredictable situations c) the independent learning ability required for continuing professional development.

PGDip Course Learning Outcome 1 (PGDCLO1)

Demonstrate a systematic understanding of knowledge, and a critical awareness of current problems and/or new insights, much of which is at, or informed by, the forefront of your academic discipline, field of study or area of professional practice with a conceptual understanding that enables the student: a) to evaluate critically current research and advanced scholarship in the discipline b) to evaluate methodologies and develop critiques of them and, where appropriate, to propose new hypotheses.

PGDip Course Learning Outcome 2 (PGDCLO2)

Demonstrate a comprehensive understanding of techniques applicable to your own research or advanced scholarship and ability to continue to advance your knowledge and understanding, and to develop new skills to a high level.

PGDip Course Learning Outcome 3 (PGDCLO3)

Demonstrate originality in the application of knowledge, together with a practical understanding of how established techniques of research and enquiry are used to create and interpret knowledge in the discipline.

PGDip Course Learning Outcome 4 (PGDCLO4)

Ability to deal with complex issues both systematically and creatively, make sound judgements in the absence of complete data, and communicate your conclusions clearly to specialist and non-specialist audiences.

PGDip Course Learning Outcome 5 (PGDCLO5)

Demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level.

PGDip Course Learning Outcome 6 (PGDCLO6)

Demonstrate the qualities and transferable skills necessary for employment requiring: a) the exercise of initiative and personal responsibility b) decision-making in complex and unpredictable situations c) the independent learning ability required for continuing professional development.

Masters Course Learning Outcome 1 (MACLO1)

The application of knowledge and comprehensive understanding of design processes and methodologies to complex mechanical engineering problems and demonstrate an integrated approach to design realisation with the ability to apply and adapt them in unfamiliar situations.

Masters Course Learning Outcome 2 (MACLO2)

The ability to apply fundamental knowledge to investigate unfamiliar complex problems within mechanical engineering and related emerging technologies and to propose and evaluate a broad range of solutions, assessing their limitations.

Masters Course Learning Outcome 3 (MACLO3)

A comprehensive understanding of the relevant scientific principles to solve complex problems in the analysis and synthesis of mechanical engineering systems and the ability to evaluate them critically and to apply them effectively, including in engineering projects.

Masters Course Learning Outcome 4 (MACLO4)

The ability to exercise initiative and take personal responsibility for teams of engineers effectively and ethically addressing the prominent social, legal, environmental, commercial and enterprise issues surrounding current and emerging complex mechanical engineering challenges.

Masters Course Learning Outcome 5 (MACLO5)

The ability to collect and analyse research data and to use appropriate engineering analysis tools including software packages for the design, analysis and synthesis of complex mechanical engineering applications and critically evaluate and communicate the results with the ability to monitor and adjust a personal programme of work on an on-going basis.

Masters Course Learning Outcome 6 (MACLO6)

An advanced level knowledge and understanding of a wide range of engineering materials and components thereby facilitating the efficient realisation of viable mechanical engineering products and systems, taking account of a range of commercial and industrial constraints.

Overview of Assessment:

Module	Title	Course Learning Outcomes
7CM003	CAD and Product Definition	MACLO1, MACLO2, MACLO4, MACLO5, MACLO6, PGCCLO2, PGCCLO3, PGCCLO4, PGCCLO5, PGDCLO2, PGDCLO3, PGDCLO4, PGDCLO5
7ET014	Computational Fluid Dynamics (CFD) and Heat Transfer	MACLO2, MACLO3, MACLO5, PGCCLO1, PGCCLO3, PGCCLO4, PGDCLO1, PGDCLO3, PGDCLO4
7ET022	Research Methods and Professional Skills	MACLO2, MACLO5, PGCCLO1, PGCCLO2, PGCCLO5, PGCCLO6, PGDCLO1, PGDCLO2, PGDCLO5, PGDCLO6
7ET023	Dissertation	MACLO1, MACLO2, MACLO3, MACLO4, MACLO5, MACLO6
7ET032	Applied Stress Analysis	MACLO2, MACLO3, MACLO5, PGCCLO1, PGCCLO3, PGCCLO6, PGDCLO1, PGDCLO3, PGDCLO6
7MA018	Advanced Materials and Manufacturing Processes	MACLO2, MACLO3, MACLO4, MACLO5, MACLO6, PGCCLO1, PGCCLO4, PGDCLO1, PGDCLO4
7MA020	Design Optimation and Simulation	MACLO1, MACLO2, MACLO3, MACLO5, PGCCLO1, PGCCLO3, PGCCLO4, PGDCLO1, PGDCLO3, PGDCLO4

Teaching, Learning and Assessment:

You will have the opportunity to engage with a wide range of learning approaches during your studies. You will take part in lectures, seminars and laboratory exercises. Some of these will be more traditional whereas others will require you to undertake research before coming together to discuss technical issues with other students and academic staff. You will have seminars from industry practitioners where you can discuss your project ideas with them to gain real world insight into the problems you are trying to solve. You will have the opportunity to work in a range of dedicated facilities such as our state-of-the-art IT Laboratories to develop practical skills and understand the link between the theory and practical implementation of integrated CAD, Simulation and Finite Element Analysis Techniques.. You will develop solutions to meet real world problems/requirements and be able to present these to your peers, practitioners and third parties to obtain balanced and current feedback.

The assessment methods used with the programme are varied, formative and will develop your transferable skills as well as your technical ability. The ability to plan, judge, communicate complex issues, solve problems logically, and develop original solutions, in appraising critically the work of others, and in managing your own learning are all significant contributors to determining your grade for a module.

Some modules on the course are assessed by a mixture of coursework and examination. The coursework is designed to assess practical skills and problem-solving ability whereas the examination will focus more on assessing knowledge and understanding. Some modules will be teaching practical applied skills and so may be assessed entirely by coursework which might include laboratory work, report writing and presentations.

The learning strategy will promote the transferable skills gained during the course. These will include project management, analytical thinking, process application and materials analysis allowing you to pursue a career in Mechanical engineering. Where possible, you will be encouraged to undertake live industrial projects as part of your study, as this activity will assist those who may choose industrially based careers in research and development, design, or product development. In addition, the combination of materials knowledge, design capability and the understanding of applications for new and emerging technologies will provide you with a wide range of employment opportunities in technical/research environments across the world.

To further underpin the teaching and learning activity, research-led teaching activities will be a significant feature of this MSc course. Research within Engineering is currently being done in several areas including Additive Layer Manufacture, Metal Cutting, Finite Element Analysis, and Design and Process Development; all these areas are fully represented in the MSc course proposed.

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:

General University support:

University Learning Centres are the key source of academic information for students. Learning Centres provide physical library resources (books, journal, DVDs etc.) and offer a range of study areas to allow students to study in the environment that suit them best: Social areas, quiet and silent areas. Learning Centres also provide access to wide range of online information sources, including eBooks, e-Journals and subject databases.

Learning Centres also provide students with academic skills support via the Skills for Learning programme. Students on campus can attend workshops or ask for one-to-one help on a range of skills such as academic writing and referencing. Students can access a range of online skills material at: www.wlv.ac.uk/lib/skills

The University Student Support website offers advice on a variety of matters (careers, counselling, student union advice, etc.) Students can also access these services by booking appointment with the SU, careers, counselling services, etc.

Course Specific Support

Each student will be allocated a personal tutor and will be expected to make contact at regular periods throughout their study. In addition there is a course leader in place that will advise on day to day course matters that may arise.

University Learning Centres are the key source of academic information for students providing access to:

Physical library resources (books, journal, DVDs etc.). Study areas to allow students to study in the environment that suits them best: Social areas, quiet and silent areas. A wide range of online information sources, including eBooks, e-journals and subject databases. Academic skills support via the Skills for Learning programme. Students on campus can attend workshops or ask for one-to-one help on a range of skills such as academic writing and referencing. Dedicated Subject Pages to enable you to explore key online information sources that are recommended for their studies.

Leave of Absence: The University allows breaks in learning of up to two years and there is a process for applying for a leave of absence, which can be accessed through your e:Vision account. Initially you will need to apply for the leave of absence, which could be for medical, parental or personal reasons. A short-term absence, such as annual leave, must not be recorded as a break. The course leader will consider, and where appropriate agree, the leave of absence application. A return date will be identified and agreed for a suitable point in the programme. Additional course fees may be incurred as a result of a leave of absence and you are advised to discuss this with the Faculty Student Services team prior to application.

Employability in the Curriculum:

The course is aimed at students who wish to undertake a career in mechanical engineering administration and management. The examples and case studies used in the course are all designed to increase the students' knowledge of the theory and practice of mechanical engineering to enhance their employability.

This innovative course offers graduates excellent career prospects in a broad field of mechanical engineering related industries. It will also provide excellent preparation for those wishing to undertake a PhD or EngD . This course is a broad-based programme covering an important and industrially-relevant portfolio of mechanical engineering modules including Fluid Dynamics and Heat Transfer, Stress Analysis, Finite Element Analysis Techniques, Advanced Materials and Computer Aided Product Design.

This taught course offers a wide exposure to the philosophy and practice of Mechanical Engineering design whilst simultaneously enabling the students to deepen their knowledge of certain engineering disciplines, which have largely been chosen on the basis of our research and teaching strengths of the discipline in the school of Engineering.

Effective communication is an important employability skill for the modern professional engineer. This course includes sessions to help develop the ability, both through formal guidance sessions dedicated to good practice in report writing, and through oral/poster presentations of project work. This is designed to support the research project (worth 60 credits) which is undertaken throughout the duration of the course. Project work is assessed by dissertation and oral/poster presentations.