

Course Specification

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Core Information

Awarding Body / Institution:	University of Wolverhampton		
School / Institute:	School of Engineering, Computing, and Mathematical Sciences		
Course Code(s):	MA029P01UV	Full-time	2 Years
Course Title:	MSc Mechanical Engineering with Professional Practice		
Hierarchy of Awards:	Master of Science Mechanical Engineering Postgraduate Diploma Mechanical Engineering Postgraduate Certificate Mechanical Engineering University Statement of Credit University Statement of Credit		
Language of Study:	English		
Date of DAG approval:	07/Nov/2019		
Last Review:	2019/0		
Course Specification valid from:	2019/0		
Course Specification valid to:	2025/6		

Academic Staff

Course Leader:	Mr Iain Llyall
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)

Students should normally be educated to honours degree level, with a minimum classification of 2:2 in Mechanical Engineering, Technology or a closely related derivative.

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 and demonstrable professional experience can substitute for graduate status.

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

Normal University of Wolverhampton criteria for English Language will apply to international students admitted to this course - Students whose first language is not English, and who live/study in a non-majority English-speaking country are required to have an appropriate grade/score in an approved English language examination. Students will need to achieve IELTS (or equivalent*) with minimum entry requirement 6.0 overall, and a minimum of 5.5 in each of the four skills.

**The university also accepts many other UK and International Qualifications in place of IELTS-*

<https://www.wlv.ac.uk/international/internationalacademy/english-at-the-international-academy/language-entry-requirements/>

Please use the following link <https://www.wlv.ac.uk/international/international-academy/> to see the range of English Language Pre-Sessional courses and related Pre-Master's courses offered by the University of Wolverhampton International Academy.

For further information relating to overseas qualification please use the following link

<https://www.wlv.ac.uk/international/our-locations/your-country/>

Distinctive Features of the Course:

At a time when there is an international shortage of mechanical engineers, there has never been a better time to enter this dynamic and rewarding industry. This course has been developed in close partnership with employers, focusing on the development of key skills that employers specifically demand. New learning and teaching facilities are an integral part of a recent £10m investment at the University of Wolverhampton's Telford Innovation Campus - A significant and carefully targeted investment to meet all the teaching and learning needs of students on this postgraduate course. Our state-of-the-art specialist equipment used in the delivery of this course including Solid Mechanics and Fluid Mechanics laboratories, Subsonic and Supersonic Wind Tunnels, Advanced Materials and Composites Analysis and Advanced Additive Manufacturing facilities are available at our Innovation Campus. 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.

This two-year master's degree with an integrated Professional Practice Placement enhances your qualification

by adding a vocational or research-based placement to the traditional taught master's programme. A vocational internship is a superb way to gain work experience and give your CV a competitive edge and make you more attractive to international employers, whilst a research internship provides you with the opportunity to develop your analytical, team-working, research and academic skills by working alongside a research team in an academic setting.

By studying this two-year master's degree with Professional Practice, you will enjoy a wider experience of study and culture whilst living in the UK also benefiting from a vacation period when you can gain extra work experience, enjoy travel, or relax.

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:

This innovative MSc with Professional Practice 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, the taught elements of this course cover 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.

In the First Year you will pay attention to the development of investigative, modelling and computational strategies in Mechanical Engineering. 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 contemporary analytical techniques pertinent to product development, manufacture and sustainability and to apply these techniques to synthesise novel designs for a range of engineering applications.

A principal component in the Second Year of this 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 of interest. Dissertation project work involves regular meetings with an academic supervisor, with the remaining time devoted to project management, practical lab or computer work and preparation for written and oral reporting.

The integrated Professional Practice Placement offers the opportunity to spend six months working full-time to gain all-important work experience and employability skills. It will enable you to critically engage with either external stakeholders or internal academic staff and to reflect on your own personal development through your Professional Practice experience. You'll complete the Professional Practice Placement after you have completed the taught part of your degree, but before your final dissertation project! Students will be required to complete an additional Module: *7CS025 – Professional Work Experience and Development* and produce a reflective learning portfolio to demonstrate tasks undertaken and experience gained during their Professional Practice Placement.

There are two Professional Practice Placement options;

1. Professional Practice - Research Placement**: Develop your research and academic skills by undertaking a 26-week research internship within a University of Wolverhampton research centre/institute. You can experience working as part of a research team in an academic setting. This option is most suitable for those who are interested in a career in research or academia.
2. Professional Practice - Vocational Placement**: Spend 26 weeks working full-time in industry. The School of Engineering enjoys close links with a variety of local, national and international companies who can offer you the chance to develop your knowledge and professional skills in the workplace through a Vocational Placement.

** We can guarantee a limited number of Professional Practice – Research Placement positions but cannot guarantee a Professional Practice - Vocational Placement. We will, however, provide you with practical

support and advice on how to find and secure your own Vocational Placement position should you prefer this type of placement – *all are subject to approval by the University in accordance with agreed Health, Safety and Welfare requirements. Research Placements are unpaid and Vocational Placements may be paid or unpaid and enhances the students' employability.*

Vocational Placement opportunities will be available on a competitive basis as determined by employers and a limited number of Research Placement opportunities will be allocated on a first come, first served basis.

Intakes:

September
January

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
2021/2	H	Full Time	£7278.00
2021/2	Overseas	Full Time	£14950.00
2022/3	H	Full Time	£8883.00
2022/3	Overseas	Full Time	£15450.00
2023/4	H	Full Time	£9328.00
2023/4	Overseas	Full Time	£16450.00
2024/5	H	Full Time	£9794.00
2024/5	Overseas	Full Time	£16950.00

PSRB:

None

Course Structure:

January (Full-time)

Module	Title	Credits	Period	Type
7ET014	Computational Fluid Dynamics (CFD) and Heat Transfer	20	SEM2	Core
7MA018	Advanced Materials and Manufacturing Processes	20	SEM2	Core
7CM003	CAD and Product Definition	20	SEM2	Core

January (Full-time)

Module	Title	Credits	Period	Type
7ET032	Applied Stress Analysis	20	SEM1	Core
7ET022	Research Methods and Professional Skills	20	SEM1	Core
7MA020	Design Optimisation and Simulation	20	SEM1	Core

January (Full-time)

Module	Title	Credits	Period	Type
7CS025	Professional work experience and development	20	CRYRA	Core

January (Full-time)

Module	Title	Credits	Period	Type
7ET023	Dissertation	60	CRYRA	Core

September (Full-time)

Module	Title	Credits	Period	Type
7ET022	Research Methods and Professional Skills	20	SEM1	Core
7MA020	Design Optimisation and Simulation	20	SEM1	Core
7MA018	Advanced Materials and Manufacturing Processes	20	SEM2	Core
7ET014	Computational Fluid Dynamics (CFD) and Heat Transfer	20	SEM2	Core
7ET032	Applied Stress Analysis	20	SEM1	Core
7CM003	CAD and Product Definition	20	SEM2	Core

September (Full-time)

Module	Title	Credits	Period	Type
7CS025	Professional work experience and development	20	YEAR	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:

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

Section 2.3.6 - Exemption to exceed the standard credit requirements for a Master's Degree, increasing to a minimum of 200 credits, in order to include a 20 credit placement module.

Section 3.3.2 - Exemption to extend the maximum period of registration to three years, with a normal duration of 18 months (or three semesters), in full-time mode of study.

Section 4.2.6 - Exemption in accordance with Institution of Engineering and Technology (IET) and Institution of Mechanical Engineers (IMechE) requirements. Compensation will be permitted for a maximum of 20 credits overall. There is no compensation permitted for independent study or project 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).

Section 6.1.1 - Exemption to exclude placement modules from the criteria for classification of a Master's Degree.

APPROVED (by Chair's Action on 1/10/2024).

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)

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
MA01 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.	
MA02 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.	
MA03 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.

Learning Outcomes

Modules

MA04 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.

MA05 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.

MA06 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.

01 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.

02 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.

03 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.

04 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.

05 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.

06 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.

07 Demonstrate your transferable skills to analyse self and other actions in enabling a wide range of vocational outputs within an organisational context and adhere to legal, social and ethical frameworks in the area of practice. Demonstrate analytical and advanced problem-solving skills in a working Engineering environment; and reflect upon and critically appraise the work undertaken enhancing employability and career prospects in the Engineering industry.

PGCERT01 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.

PGCERT02 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.

PGCERT03 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.

PGCERT04 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.

PGCERT05 Demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level.

PGCERT06 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.

PGDIP01 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.

PGDIP02 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.

PGDIP03 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.

PGDIP04 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.

PGDIP05 Demonstrate self-direction and originality in tackling and solving problems, and act autonomously in planning and implementing tasks at a professional or equivalent level.

PGDIP06 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

Modules

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 computer 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 within 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 and ultimately, your degree classification.

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 and management environments across the world.

To further underpin the teaching and learning activity, research-led teaching activities will be a significant feature of this MSc with Professional Practice course. Research within the school of 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 this MSc course.

Successful completion of the Professional Practice Placement element will require you to submit a satisfactory placement portfolio at the end of your placement in accordance with the Learning outcomes and assessment requirements of the module 7CS025 – Professional Work Experience and Development. Students who are unable to secure, or satisfactorily pass, their Professional Practice Placement will be completed on the MSc Mechanical Engineering title (180cr).

The Professional Practice semester and thus completion of the module 7CS025 – Professional Work Experience and Development, will be assessed on a pass/fail basis and as such, it does not contribute to the classification of the final degree. However, when taken and passed it is recognised both in the transcript as a 20 credit Module and in the degree title – MSc Mechanical Engineering (with Professional Practice) – 200 Credits.

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 Libraries](#) are the key source of academic information for students. Libraries 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. Libraries also provide access to wide range of online information sources, including eBooks, eJournals and subject databases.

Libraries 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 on-line 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 Libraries 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, eJournals 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 on-line 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.

Professional Placement and Work Experience: 'The Workplace' offers a great range of opportunities for current students to gather much valued work experience during their course of study at the University of Wolverhampton. The team at 'The Workplace' constantly search for new placement opportunities but if you find an opportunity that interests you or you have been successful in securing one yourself, the Workplace team can be contacted for further support! More information can be found here

<https://www.wlv.ac.uk/current-students/careers-enterprise-and-the-workplace/jobs-and-placements/student-support/placements/>

Employability in the Curriculum:

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

This innovative course offers you 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 you to deepen your 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 you 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 in the second year of the course. Project work is assessed by dissertation and oral/poster presentations.

The Professional Practice Placement offers you the opportunity to spend six months working full-time to gain all-important work experience and employability skills. It will enable you to critically engage with either external stakeholders or internal academic staff and to reflect on your own personal development through your Professional Practice experience. This placement experience gives you the opportunity to apply skills and knowledge acquired during the taught part of your programme and to acquire new skills and knowledge in an alternative learning environment.

The addition of 7CS025 – Professional work experience and development module will embed employability in this course by allowing students to undertake a Professional Practice with an employer or a School/Faculty research Centre/Institute.

This MSc Mechanical Engineering with Professional Practice develops the competencies you will need to apply for registration as a Chartered Engineer (CEng) when you graduate.

On successful completion of this award, students will also be eligible to apply for progression to PhD studies within the School of Engineering at University of Wolverhampton.

