



Programme Handbook

MSc

Mechanical Engineering

2015-2016

Faculty of Engineering and Environment

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1 Welcome from the Programme Leader

Dear student,

On behalf of the programme team, I am delighted to welcome you to the MSc Mechanical Engineering programme at Northumbria University. We all hope that you have a fulfilling experience whilst undertaking your postgraduate studies. We wish you every success both during your programme and for your future.



Dr Alireza Maheri

2 About this handbook

In this Handbook you will find key information relating to your programme of study at Northumbria. It should be read alongside the University and Faculty Student Handbooks which contain more general information about being a student at Northumbria within the Faculty of Engineering & Environment. It is important that you keep the Handbook in a safe place for reference purposes throughout the year.

It does not provide all of the information that you will need although it attempts to tell you where to find most of that information. The latest version of much of the further information that you need is to be found in a comprehensive and definitive form on the Northumbria website. A key page is titled 'Student Hub' <https://www.northumbria.ac.uk/student-hub/> (this is also available by clicking on 'Student Hub' on the University home page). In this page you will find many useful links including:

- [My Northumbria](#), where you will find relevant information to help you with your daily life at Northumbria University.
- [Blackboard/eLearning Portal](#), where you have access to the teaching/learning documents and module information for each module you are enrolled in.
- [Desktop Anywhere](#), the portal allowing you to access your online dedicated drive and all available online resources from any computer outside university.
- [University Library](#) The Library has what you need to be successful in your studies from study skills, to good academic practice, as well as access to a wide range of resources.
- [Timetabling](#), where you can download your timetable.
- [IT Services](#), where you receive support for all queries regarding IT Services such as email, login credential, etc.
- [Students' Union](#), the social heart of student life, run by students for students. Everyone who enrolls with the University automatically becomes a member and can therefore enjoy all the benefits the Union offers.

Another useful page is 'Supports for Students' available from the University home page: Home> Study>Support for Students: <https://www.northumbria.ac.uk/study-at-northumbria/support-for-students/>

If there is further information which you need, or queries that you may want answering, please do not hesitate to contact the programme leader at any time.

3 Who's who-Who to go to for help

You will meet a broad range of academic, administrative and technical staff throughout your studies. Staff from the Faculty of Engineering and Environment, and from the wider university (such as the University Library, IT Services and Student Support and Wellbeing Services), are here to help you get the most out of your Programme. In this section, we introduce you to some of the key people who will support you at School and subject area level.

3.1 Faculty Office

Office Location: Ellison Building Room B201

Email: ee.studentsupport@northumbria.ac.uk

Telephone: 0191 227 4722

Office hours: 8.30 am – 5 pm Monday to Thursday, 8.30 – 4.30 pm on a Friday

This is a dedicated point of help for students. It should be your first point of contact for most queries.

3.2 Programme Leader

Dr Alireza Maheri

Office Location: Room WJ212, Wynne Jones Building

Email: Alireza.Maheri@northumbria.ac.uk

Telephone: 0191 227 3860

Your Programme Leader is the academic leader for your Programme and is responsible for managing the programme on a day to day basis, working with other University staff – academic, administrative and technical – as needed. Your Programme Leader is committed to helping you get the most out of the Programme and, where relevant, will liaise with your Module Tutors and other relevant staff to make sure that they are aware of your needs and programme issues.

3.3 Programme Administrator

Your Programme Coordinator holds all the key information regarding your programme. This is the person who manages such processes as enrolment, option choice, day to day correspondence, confirmation of attendance letters, marks entry, etc. They can be contacted via the Student Office.

Programme Coordinator: Mrs Catherine Hambley (Ellison Building, EB201)

3.4 Module Tutor

For each module of study, you will have a designated Module Tutor. The Module Tutor is responsible for the organisation of the module and supporting your learning and assessment on that module.

Further details on all modules including tutor, reading list, aims etc. can be found here: <http://nuweb.northumbria.ac.uk/live/webserv/mod.php>

4 Communication

4.1 Contacting Academic Staff in General

You may occasionally wish to talk to academic staff, including module teaching staff on your programme. You may wish to note that at University, many of your teaching and academic staff may not be available at all times for individual support. Instead, they may be carrying out a variety of other roles and activities that mean they are not always available at short notice; they may be away attending a conference for several days, carrying out some research or consultancy activity, working with collaborating partners at other establishments, or performing other such actions that mean they may not immediately be available to help you with your studies. Thus it is advisable to make an appointment if you wish to see them.

Please note that appointments should normally be requested at least 48 hours beforehand. Also, be aware that a member of staff may have been held up by unforeseen events. If they are late for an appointment, please wait. If you are late or cannot make an arranged appointment, please contact staff, for example by e-mail, to let him/her know as soon as possible.

There are a number of ways to make an appointment. You can do this via email (this is the best way) or by telephone. If you cannot reach a tutor immediately by phone, try again later, preferably by e-mail taking into account the above guidance.

Email is used extensively throughout the University and is a very effective method of communication between students and staff. You will be automatically allocated an email address by the University once you have enrolled. Do remember that the Northumbria email address is the one that should be used when contacting University and faculty staff. Please be aware that staff may not reply to your email immediately due to their other duties and activities (as described earlier). If you do not get a reply within a few days, then email again to remind them of your initial request, or if other people may be able to deal with your issue e.g. Faculty Office, other member of module teaching team, etc. then please try them.

Please note that e-mail is also the dominant means used by staff to make contact with you, so do make sure that you check your University email account regularly- at least daily.

4.2 Contacting Your Programme Leader

IT IS VITALLY IMPORTANT THAT IF YOU HAVE AN ISSUE YOU CONTACT ME AS SOON AS POSSIBLE. The best way to contact me is via email (Alireza.Maheri@northumbria.ac.uk). Alternatively, you can just turn up at my office. Occasionally you may be able to have an immediate appointment.

4.3 eLearning Portal

The eLearning Portal (eLP) is a very important resource for students. You will find specific information related to the modules you are taking, such as copies of lecture and seminar handouts, assignment briefings, instructions, and announcements. Your Programme Leader uses the eLP to pass on information concerning programme matters. Faculty office staff may also make use of the eLP to inform you of things. It is therefore important that you check the eLP regularly - at least daily - for new announcements and new material.

4.4 Plasma Screens

The faculty owns a number of plasma screens used to display announcements, events and opportunities.

4.5 Feedback

The students in your cohort elect the Student Representatives. The Reps' commitment will be to gather 'issues and ideas' from fellow students and feed these back each semester at programme committee meetings with the Programme Management Team. The results of such discussion between the Reps and programme team fed back via published minutes and through the Reps. The main role of the Student Rep is to represent the students on the programme related matters at the programme committees, however their role need not be limited to participation in programme committees, nor need they wait for the committee to meet to act on any issues affecting the student body.

PLEASE NOTE: *IT IS REALLY IMPORTANT THAT IF YOU HAVE AN ISSUE YOU CONTACT US AS SOON AS POSSIBLE – WE ARE HERE TO HELP*

5 Programme Information

Here you will find specific information on your programme of study. There is a national requirement that all university programmes of study have a publicly available Programme Specification and this section is based on that programme specification. The full and definitive version of the programme specification can be found at

<http://www.northumbria.ac.uk/programmespecs/>

5.1 Programme Aims

The world-wide engineering and manufacturing (centralised and distributed) industry continues to be faced with ever increasing competition as globalisation continues apace. To remain competitive, engineering enterprises are continually required to give better value to their customers. This increase in value usually manifests itself in reduced costs and improved quality, where quality is considered in terms of reliability, performance and life. These three factors are often related and their achievement is very dependent upon a thorough understanding and application of a range of advanced engineering techniques. The programme aims to meet the demand for persons with the expertise to understand, critically evaluate and apply modern advanced Mechanical Engineering techniques.

The programme curriculum is such that it requires students to consider the application of the techniques within the wider context of mechanical engineering. Graduates are expected to possess in-depth knowledge and understanding with the skills to analyse, model and optimise advanced Mechanical Engineering systems.

Specifically the programme aims to:

- Provide a coherent educational experience based on the analysis of engineering problems, which leads to the award of the degree of Master of Science.
- Provide the opportunity to study, understand and apply appropriate advanced analytical engineering techniques.
- Produce graduates who can apply fundamental principles and techniques in the problem-solving process.
- Enhance the academic and professional development of the students to enable them to be self-evaluative, reflective practitioners and life-long learners.
- Produce graduates who can competently evaluate and apply a range of research techniques using both primary and secondary sources to successfully undertake a research or investigative project in the area of specialisation.
- Develop the application of professional and ethical principles, standards and practices in the related subject discipline.
- Develop a critical awareness of and the ability to evaluate current issues in the specialist area in order to foster the ability to produce new insights and propose new solutions.
- Produce graduates who can evaluate theoretical frameworks and models and select appropriate techniques and tools for the analysis of complex systems.

5.2 Programme Learning Outcomes

Knowledge and Understanding

Students will be able to demonstrate specialist in-depth knowledge and critical understanding of:

- essential facts, concepts, principles, theories, methods, techniques and tools in Mechanical Engineering and related topics.
- the role, nature, evolution, and limitations of methods and technologies appropriate to Mechanical Engineering and relevant interdisciplinary areas.
- the major issues at the frontiers of research and development in Mechanical Engineering.
- professional, ethical and legal issues involved in the development and operation of new technologies and methodologies.

Intellectual Skills

Students will be able to:

- apply knowledge and understanding to systematically identify and analyse complex problems and offer appropriate strategic solutions using a range of effective methods and tools.
- critically examine, understand, apply, discuss and evaluate philosophies, techniques, tools and methods relevant to the subject discipline for a range of applications
- use evidence and criteria to integrate, evaluate, interpret and synthesise information and data from a variety of sources.
- understand how the boundaries of knowledge are advanced through research and advance scholarship.
- apply and evaluate appropriate research techniques to undertake a research problem.
- identify, plan and execute a significant individual project by conducting independent research and applying a range of specific skills and established techniques in research methodologies and literature reviewing.

Practical Skills

Students will be able to:

- define problems and identify the key issues and parameters affecting their solutions.
- select and apply scientific principles to model problems
- apply a range of knowledge, techniques and tools in analysis, design, testing and maintenance of high quality solutions to complex problems
- select and use appropriate methods and techniques to analyse non-routine problems
- search for, retrieve, evaluate and apply information to support research, using a rigorous, scientific approach.
- manage projects, integrating practical skills across disciplines effectively and safely.

Transferable/Key Skills

Students will be able to:

- learn independently, enhancing their existing skills and developing new ones to a high level, enabling them to sustain their own continued professional development.
- demonstrate creativity in problem solving and decision making in complex and unpredictable solutions
- effectively and professionally communicate information, ideas, arguments, problems and their solution in both written and oral form to a range of audiences.

- demonstrate initiative, personal responsibility, personal enterprise, self-reliance and self-direction, acting autonomously in planning and implementing tasks at a professional level.
- manage their time and resources effectively.
- engage in critical self-appraisal of their own learning experience, personal strength, limitations and performance.
- justify, organise, complete and appraise research at a high level over an extended period.

5.3 Programme Structure

September Start Programme Structure

Semester 1	Semester 2	Summer	Semester 1
Sept - Jan	Feb - May	Jun - Sept	Sept - Jan
EN0774 (20 credits) Advanced Dynamics and Vibration Systems	EN0767 (20 credits) Engineering Research & Project Management	<u>16 month programme</u> Vacation	<u>16 month programme</u> EN0765 (60 credits) MSc Engineering Project
EN0773 (20 credits) Computational Thermofluids	EN0775 (20 credits) Advanced Stress and Structural Analyses	<u>12 month programme</u> EN0765 (60 credits) MSc Engineering Project	
EN0758 (20 credits) Modern Engineering Design and Optimisation	EN0771 (20 credits) Product Design and Development		

January Start Programme Structure

Semester 2	Summer	Semester 1	Semester 2
Feb - May	Jun - Sept	Sept- Jan	Feb - May
EN0767 (20 credits) Engineering Research & Project Management	Vacation	EN0774 (20 credits) Advanced Dynamics and Vibration Systems	EN0765 (60 credits) MSc Engineering Project
EN0775 (20 credits) Advanced Stress and Structural Analyses		EN0773 (20 credits) Computational Thermofluids	
EN0771 (20 credits) Product Design and Development		EN0758 (20 credits) Modern Engineering Design and Optimisation	

6 Learning, Teaching and Assessment Strategy

The learning, teaching and assessment, methods follow the University strategy and guidelines and the QAA Code of practice on assessment. The methods provide wide diversity, incorporating the appropriate techniques to fit both the particular subject under study and the depth of learning required at postgraduate level.

Assessments are designed to reflect module learning outcomes and are varied. The assessment methods employed reflect the wide range of teaching and learning practices and diversity of subject matter and test the learning outcomes of each module in an appropriate way. Both summative and formative assessments are utilised, the latter to provide students with developmental feedback to help students develop the skills, techniques and expectations of summative assessment. Summative assessment methods include assignments, exams, technical reports, presentations, portfolio and project work.

As well as ensuring that you prepare yourself properly for the end of Module examinations, it is important to maintain a high standard of course work, and that you submit all the course work required from you. The lecturer may specify the length of the report that is required and deviating from these guidelines could carry a penalty.

The students are expected to evaluate theoretical or practical frameworks for the analysis and critical evaluation of a variety of issues, informed by recent research. Where appropriate, they are expected to produce new critiques, methodologies and insights and propose new solutions to problems.

The learning, teaching and assessment methods are designed to provide a development continuum from the Certificate through to the Diploma and full Masters Awards, supporting the progressive development of the learning outcomes and the demands of increasingly advanced postgraduate work. Students participate in a mixture of learning experiences including lectures, small group seminars, laboratory sessions, simulated practical skills sessions and field study visits where appropriate. Delivery is also supported by the use of a range of academic and case study based learning materials. There is an emphasis on independent learning and using new research developments in the relevant subject area.

For the award of MSc students must undertake a substantial individual project, which critically evaluates and applies appropriate research techniques and methodologies. All students are prepared for the project by an earlier core module on research methods and project management. Students are encouraged to find a real-problem linked to industry. All students are allocated an academic project supervisor who is a suitable subject specialist. Supervisors meet their students regularly on a one-to-one basis, providing full support throughout the period of the project.

6.1 Assessment Regulations for Northumbria Awards (ARNA)

All matters relating to progression and awards are contained within Assessment Regulations for Northumbria Awards (ARNA) document accessible by link below and you should familiarise yourself with these regulations. If you are unsure about any of the details in these regulations please do not hesitate to contact the Programme Leader or the Faculty Office.
<http://northumbria.ac.uk/sd/central/ar/qualitysupport/assess/assproc/assdocstud>

6.2 Submission of Assignments and Coursework

Work that is submitted for assessment is often handed in via the Faculty Office (EB B201) unless other arrangements are made by the module staff e.g. via the eLP. The lecturer will inform the Faculty Office that work is to be handed in on a particular day and time period. The student must obtain a pro-forma (from the office) to attach to the front of the work and fill in the necessary details such as Module Number, Module Leader, Student Name etc. and they will get back a receipt as proof of handing in. The work can only be handed in at this time and failure to do so will result in a mark of zero.

The rules and regulations regarding the late submission of work and personal extenuating circumstances (PEC) are as defined in ARNA, details of which are available from the University website. The Faculty Office will also be able to offer guidance on this.

6.3 Academic Misconduct

Any assessed work that is submitted by a student should ensure that it is their own work and it fully acknowledges the opinions of others. Full details of the regulations governing academic misconduct can be found in the Assessment Regulations for Northumbria Awards (ARNA). These guidelines apply to all University programmes, their modules and assessment, and are equally applied to all aspects of study. The Penalty for academic misconduct may vary between a mark no higher than a pass through to being required to withdraw from your programme. It is suggested that you always refer to the current version of ARNA prior to submission of any piece of work to avoid accidental infringement and ensuring the academic integrity of your work.

7 2015-2016 Programme Schedule*

Semester One		
Welcome/Induction Week	Monday 14 September to Friday 18 September 2015	1 Week
Teaching Weeks	Monday 21 September to Friday 11 December 2015	12 weeks
December Congregation for courses completing after June Examination Boards	Monday 7 & Tuesday 8 December 2015	2 days
Winter Break	Monday 14 December 2015 to Friday 1 January 2016	3 weeks
Assessment Weeks	Monday 4 January to Friday 15 January 2016	2 weeks
Semester Two		
Welcome/Induction week	Monday 11 January to Friday 15 January 2016	1 week
Teaching Weeks	Monday 18 January to Friday 18 March 2016	10 weeks
Spring Break	Monday 21 March to Friday 8 April 2016	3 weeks
Teaching Weeks	Monday 11 April to Friday 29 April 2016	2 weeks
Assessment Weeks	Tuesday 2 May to Friday 20 May 2016	3 weeks
Final year results published	Friday 24 June 2016	1 day
Summer Award Congregations <i>(provisional)</i>	Thursday 7 to Wednesday 13 July 2016	1 week
Reassessment Period <i>(provisional)</i>	Monday 22 August to Friday 26 August 2016	1 week

* Correct at time of going to press, may be subject to change.

Important Note:

Students must note the above dates and ensure their availability to fulfil all academic requirements for their programme of study. This may include term time dates even after your last assessment is completed.

8 Other Course Specific Information

8.1 Assessment and Feedback Schedule

You will receive the course work assessment and feedback schedule during the second teaching week of each semester.

8.2 Timetables

Timetables are subject to change at short notice and should be checked regularly, and your notice board will display timetable and other related information. To check online timetables for teaching weeks and examination periods, please see

<http://nuweb.northumbria.ac.uk/timetabling/tt/ttreports.htm>

Also Look at MyNorthumbria for your personal timetable.

8.3 Attendance Monitoring

Registers of attendance are taken in several scheduled teaching sessions (e.g. in workshops). These are used to monitor attendance and if students are found not to be attending they will be contacted to determine the reason. If there is a problem causing poor attendance it may be that the University can help. Experience shows that that good attendance helps students to pass and do well. Please note that continued non-attendance can result in the student being asked to leave their programme of study.

8.4 Computing Resources and Laboratories

The faculty is housed in Pandon Building, Ellison Building and Wynne Jones Centre. Some computing laboratories are open to all University students, such as those in the Library or Pandon Basement. Some of the computers in the open access Pandon Basement lab also have specialist software. Guidance as to appropriate specialist facilities will be provided by the module tutors as required.

The faculty has approximately thirty laboratories with many of them containing fast moving, high voltage or dangerous machinery. It is for this reason that the faculty has a Student Code of Practice for Safe Working, and Health and safety guidelines in the faculty that can be found in the Faculty Handbook.

8.5 Safety and Security

The University is committed to ensuring the safety and security of all students. To this end the University has an approved Student Safety and Security strategy and a permanent Working group which:

- Addresses student safety and security concerns – both on and off campus.
- Fosters good relations between students and other residents in the local community.
- Ensures students are aware of safety and security issues.
- Helps students understand their potential responsibilities as residents of the local community.

It is important that all students understand issues of personal safety and community responsibility.

Library

The libraries at City Campus and Coach Lane provide access to a wide range of print and electronic resources including over half a million print books, over 700,000 eBooks and more than 50,000 electronic journals. More details can be found on the University Library website: <http://library.northumbria.ac.uk/home>

City Campus Library (number 14 on City Campus map) is housed near the Student Union building (number 30 on City Campus map).

Coach Lane Library is situated on the East Side of the Campus, in F Block (number 16 on Coach Lane Campus map).

City Campus library is open 24/7 during term time and from 9am to midnight during vacation times. Coach Lane library is open 7am until midnight (Monday to Friday), 9am until midnight (Saturday and Sunday). Opening hours are prominently displayed in the foyers of the library buildings, any changes are advertised on the Library website and on social media. Opening hours vary during bank holidays and are subject to change, so please check before you travel.

You will need to keep your smartcard with you to gain access to and leave the libraries. Your Smartcard is a universal card which not only gives access to the Libraries and other University buildings, but it also allows you to print, copy, scan, borrow books and make cashless payments.

The Library Catalogue can be accessed on and off-campus through the University Library website and the dedicated catalogue computers on each floor of both Libraries. The catalogue can be used to search for books and eBooks located in the University Library. It is quick and easy to use and will give you the information you need to locate the material on the shelves or read online. eBooks can be read on and off-campus, anytime, anywhere. NORA can be used to search for, and retrieve, up-to-date scholarly materials including articles, reports and statistics that are relevant to your studies. You can browse through all the online resources relating to your subject in one place including databases, journals and websites.

Students are entitled to borrow up to 15 items at any one time. Items can be issued using the self-issue machines on the ground floor of City and Coach Lane Libraries. You can renew your library books online through the MyLibrary section of MyNorthumbria or via the Library Catalogue.

Northumbria students can use other libraries such as the Robinson Library at Newcastle University and Newcastle City Library using the SCONUL access scheme. For more information see the Library SCONUL information page: <http://library.northumbria.ac.uk/sconul-holiday>

The Northumbria Skills Programme is a comprehensive skills programme designed to develop the key skills you need to succeed at university and beyond provided by the Library. It runs throughout the year and provides classroom style skills sessions on many topics including academic writing skills, giving accomplished presentations, and referencing your work correctly, as well as regular drop in surgeries. Some sessions are bookable; simply consult the timetable on the Northumbria Skills Programme website: <http://library.northumbria.ac.uk/skillsdev-nspp>

Skills Plus is the Library's collection of online learning materials, with a focus on digital literacy and study skills that can be accessed on and off-campus. Using these resources is an excellent way to develop your skills through a range of online tutorials with quizzes, video demonstrations and printable help guides. <http://nuweb2.northumbria.ac.uk/library/skillsplus/topics.html?l3-0>

If you need help or advice, on or off campus, you can contact Ask4Help. The Ask4Help service provides you with help and support to access a range of University services including Library, Disability Support, Student Finance and Careers. The quickest way to find answers to some of the most popular questions asked by students is to look at Ask4help online. You can also contact us by phone and speak to a member of our dedicated enquiry team or email us your questions.

www.northumbria.ac.uk/ask4help

ask4help@northumbria.ac.uk

0191 227 4646

Northumbria Students' Union (NSU)

Northumbria Students' Union (NSU) is here to make sure you have the best experience possible. NSU is one of the largest and most exciting Unions in the country and that's all because of YOU. We represent you, the student, on all levels, on the issues students are concerned about; receiving a great academic experience, being very employable when you graduate, being safe on campus and in the city and having a fantastic time while a student.

NSU is run by students for students. You can have your say in what NSU does and how it is run, by contacting your [Sabbatical Officers](#) or by coming along to [Student Council](#)

MEMBERSHIP: As a student of Northumbria University you are automatically a member of the Students' Union. We also sell NUS Extra Card from the Students' Union at both [Coach Lane](#) and [City Campus](#) giving you discounts in shops and online, but you don't need one to use any of our services.

DIVERSE: Your Students' Union is a place which brings together students from all walks of life, all parts of the country and the world and many different cultures. NSU provides lots of opportunities for you to [Get Involved](#), make lasting friendships, increase employability and have FUN!

INDEPENDENT: NSU is independent of the University, with its own staff, services and decision-making structure. Run by students for students, providing the best services and opportunities for students we push for change from the University to deliver for students. Find out more at our [You Said, SU Did](#) page. If you need advice about academic appeals or other issues, we can help. Check out the [Advice Page](#).

VALUE: Your NSU offers the best value for money, and everything you spend goes straight back into the Students' Union to fund all the activities that we run for you.

If you would like more information check out the website www.mynsu.co.uk or come and see us at our [offices](#) in City, Coach Lane and London.