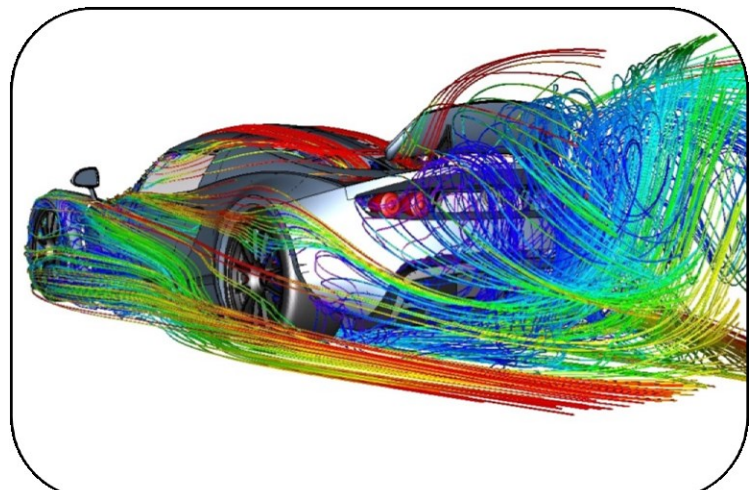


**Faculty of Engineering and Environment  
Department of Mechanical and Construction Engineering**

**PROGRAMME HANDBOOK 2015-16**

*MEng Mechanical and  
Automotive Engineering*

*BEng (Hons) Mechanical and  
Automotive Engineering*



# Contents

1	Welcome from the Programme Leader	3
2	About this handbook	4
3	Who's Who and Communication	4
	3.1 Where to go for help	4
	3.2 Communication	6
	3.3 eLearning Portal (aka Blackboard)	6
4	Programme Information	7
	4.1 Programme Aims	7
	4.2 Mechanical & Automotive Engineering Lab Provision	7
	4.3 Programme Structure	8
	4.4 Learning Teaching and Assessment Strategy	13
	4.5 Feedback	13
	4.6 Module Options	14
	4.7 Student Representatives	14
	4.8 Industrial Placement	14
	4.9 Timetable information	15
	4.10 Programme Assessment Scheme	15
	4.11 ACADEMIC CALENDAR 2015-2016	18
	4.12 Course work Guidelines	19
	Course work Styles	19
	Handing work in	21
	Academic Misconduct	21
	Calculators	21
5	Resources and Laboratories	22
	5.1 Laboratory Work	22
	5.2 Personnel Protective Equipment (PPE)	22
	5.3 Safety and Security	22
6	Supplementary Information	24
	6.1 Absence Monitoring	24
	6.2 Personnel Extenuating Circumstances (PEC)	24
	6.3 Professional Body	24
	6.4 Assessment Regulations for Northumbria Awards (ARNA)	24
	6.5 City Campus Map	27

All details are correct at time of going to press. Every effort is made to ensure that the information in the Handbook is accurate at the time of going to press. However, over time, circumstances may change and the University reserves the right to change or amend the information provided in this document. The University does not accept any liability arising out of or in connection with any such changes.

# **1 Welcome from the Programme Leader**

Welcome to Northumbria University and especially to the Department of Mechanical and Construction Engineering! Our department has over 1000 students based at Northumbria, and you are part of a growing number of students who are undertaking our degree courses at various worldwide institutes, in locations such as China, South Korea, Malaysia and Singapore.

Northumbria is strongly established as one of the leading Universities and the quality of our academic and professional staff has made this possible. Many of our lecturers have spent time in industry and research centres and are experts in their fields. We are actively involved in research and consultancy activities and these relate to how engineering knowledge can be applied to solve key industrial issues. This interaction with industry is key, as it keeps the knowledge and the content of our degree courses up to date, with the latest techniques and protocols from research and industry being introduced to undergraduate and postgraduate students via their studies.

The BEng (Hons) Mechanical and Automotive Engineering degree is a three/ four year programme, each year consisting of studying modules with a total value of 120 credits. The MEng Mechanical and Automotive Engineering degree is a four/ five year programme, each year consisting of studying modules with a total value of 120 credits. The course is characterized by a 'hands on' practical approach, with most of the modules having practical laboratory components within them.

The BEng/MEng and MSc programmes will seek accreditation by the Institution of Mechanical Engineers (IMechE). IMechE is the fastest growing professional engineering institution in the UK. The 100,000 members work at the heart of the country's most important and dynamic industries.

I hope you enjoy and find your learning experience at Northumbria University academically stimulating and enjoyable. I am sure the degree will provide you with the skills and knowledge base required to enable you to successfully achieve the goals in your chosen future career.

Best wishes,

**Dr Ulugbek Azimov**

PhD, BEng (Hons)

*Program Leader and Senior Lecturer  
Mechanical and Automotive Engineering*

Northumbria University  
Faculty of Engineering and Environment  
Department of Mechanical & Construction Engineering  
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WWW [www.northumbria.ac.uk](http://www.northumbria.ac.uk)

## **2 About this handbook**

This handbook is designed to provide a guide 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 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 'New Students' <http://www.northumbria.ac.uk/browse/newstud/> (this is also available by clicking on 'New Students' on the University home page).

## **3 Who's Who and Communication**

### **3.1 Where to go for help**

You will meet a broad range of academic, administrative and technical staff throughout your studies. The majority of staff will be drawn from the various subject areas within the Faculty. However, we also draw upon subject specialism outside the Faculty and external consultants, industrialists and advisors.

Staff from the Faculty 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 Department and subject area level.

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#### **Faculty Office**

Office Location: Ellison Building Room B201

Email: [ee.studentsupport@northumbria.ac.uk](mailto: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.**

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**Programme Administrator:** Linda Scott (email: [linda.scott@northumbria.ac.uk](mailto:linda.scott@northumbria.ac.uk))

Your Programme Administrator 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. She can be contacted via the Faculty Office.

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**Programme Leader:** Dr Ulugbek Azimov (email: [ulugbek.azimov@northumbria.ac.uk](mailto:ulugbek.azimov@northumbria.ac.uk))

Your Programme Leader is the academic leader for your Programme and is responsible for managing the programme, working with other Faculty and University staff – academic, administrative and technical, as needed, to ensure its development and delivery. 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.

Office Location: Wynne Jones Building, Room 202

Email: [ulugbek.azimov@northumbria.ac.uk](mailto:ulugbek.azimov@northumbria.ac.uk)

Telephone: 0191 243 7663

## **Year Tutors**

Your Year Tutor is a member of the academic staff and is responsible for students on this particular year of the course. They work closely with the programme leader and programme administrator to support you on your programme.

**Year tutors will be appointed later.**

## **Module Tutor**

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

Further details on all modules including reading list, aims etc. can be found here:

<http://nuweb.northumbria.ac.uk/live/webserv/mod.php>

## **Guidance Tutor**

Guidance tutors are there to support your academic and personal development for first year students. You will be allocated your guidance tutors shortly. Your guidance tutor will be getting in touch with you soon.



## 3.2 Communication

### Contacting Your Year Tutor or Programme Leader

**PLEASE ALSO ENSURE YOU MAKE USE OF YOUR MODULE TUTOR AND THEN YOUR YEAR TUTOR!** They should be your first point of call for any issue that may arise, such as timetabling issues, missing lectures/other academic sessions, absence due to illness or other problems with your course etc. **The best way to contact us is via email.**

### Contacting the Programme Team

**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.

There are a number of ways in which you may contact the programme team.

#### **By Appointment**

Sometimes you may want to talk to one of the tutors on the programme. The best way of requesting an appointment is by e-mail. 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 the tutor, for example by e-mail, to let him/her know as soon as possible.

#### **By Telephone**

Tutors will not always be able to answer your call: they may be in a meeting, teaching, doing research, working off-campus or... on holiday! If you cannot reach a tutor immediately by phone, try again later, preferably by e-mail.

#### **Email**

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. It is also the one that is used by staff to make contact with you, so do make sure that you check it regularly, particularly if you also use a personal email account. Please be aware that staff **may not reply to your email immediately** due to their other duties and activities.

*Please quote your Name (Enrolled Name), Student Number, Programme Name and Year of course in all correspondence as this will help in providing you with a prompt reply.*

Please ensure your contact details are up to-date. Any changes can be updated on "MyNorthumbria"

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

## 3.3 eLearning Portal (aka Blackboard)

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 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/>

### **4.1 Programme Aims**

The main aims of the programmes are to:

- Produce graduates in Automotive Engineering with the necessary skills and attributes to take roles within industry as Professional Engineers, and provide the educational basis to facilitate progression to Chartered Status.
- Produce graduates who can apply fundamental scientific principles and mathematical and computational techniques to realize and conceive creative and innovative solutions to engineering problems.
- Equip students with an awareness of engineering in the wider social, ethical, sustainable and economic context.
- Offer a challenging programme, which is current, relevant and informed by staff research, consultancy and professional experience.
- Provide wide opportunities for access, personnel and professional development, consistent with Professional Body requirements.

### **4.2 Mechanical & Automotive Engineering Lab Provision**

Some of the most interesting learning happens in a laboratory environment the main labs are;

- EB E003 - Mechanics, Materials and Manufacturing laboratory
- EB E002 - Project space and workshop
- EB C002a - Rapid Manufacturing Lab
- EB C002 - Thermodynamics, Fluids and Materials Laboratory
- EB E005 - Automotive Engineering Laboratory
- EB E004 - Engine and Combustion Laboratory
- EB C004c - Research Laboratory
- EB C004d - Composites Laboratory
- Specialist Software labs and open access areas
- Ellison Building - E303, D211, D201
- Pandon Building - G2
- Wynne Jones Building 301 306 and 310
- The Zone

## 4.3 Programme Structure

### Full-time BEng (Hons) Mechanical and Automotive Engineering

#### Level 4 (Year 1)

EN0100 Introductory Mechanics  20 credits Y/L	MS0265 Engineering Mathematics  20 credits Y/L	EN0402 Introduction to Vehicle Design  20 credits Y/L	EN0416 Engineering Skills in Experiment and Presentation  20 credits Y/L	EN0101 Energy and Environment  20 credits Y/L	EN0146 Materials and Manufacture  20 credits Y/L
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#### Level 5 (Year 2)

EN0200 Applied Mechanics  20 credits Y/L	MS0264 Further Engineering Mathematics  20 credits Y/L	EN0204 Computer Modelling and Design  20 credits Y/L	EN0576 Engineering Economics and Professional Skills  20 credits Y/L	EN0507 Powertrain and Chassis Systems  20 credits Y/L	EN0575 Manufacturing Technology  20 credits Y/L
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**Optional placement year**

#### Level 6 (Final year)

EN0612 Vehicle Dynamics  20 credits Y/L	EN0613 Automotive Control Systems and Mechatronics  20 credits Y/L	EN0614 Automotive Design and Analysis  20 credits Y/L	OPTION module  20 credits Y/L	EN0360 Investigative Project  40 credits Y/L
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#### Level 6 Options

A	EN0620 Digital Product Design and Analysis	B	EN0621 Advanced Manufacturing Technology
C	EN0622 Renewable Energy Technologies		

Y/L = Year long



## Part-time BEng (Hons) Mechanical and Automotive Engineering

### Level 4 (Year 1)

EN0100 Introductory Mechanics  20 credits Y/L	MS0265 Engineering Mathematics  20 credits Y/L	EN0101 Energy and Environment  20 credits Y/L
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### Level 5 (Year 2)

EN0200 Applied Mechanics  20 credits Y/L	MS0264 Further Engineering Mathematics  20 credits Y/L	EN0576 Engineering Economics and Professional Skills  20 credits Y/L	EN0575 Manufacturing Technology  20 credits Y/L
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### Level 5 & 6 (Year 3)

EN0612 Vehicle Dynamics  20 credits Y/L	EN0204 Computer Modelling and Design  20 credits Y/L	EN0507 Powertrain and Chassis Systems  20 credits Y/L	EN0613 Automotive Control Systems and Mechatronics  20 credits Y/L
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### Level 6 (Year 4)

EN0614 Automotive Design and Analysis  20 credits Y/L	OPTION module  20 credits Y/L	EN0360 Investigative Project  40 credits Y/L
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### Level 6 Options

A	EN0615 Vehicle Aerodynamics	B	EN0621 Advanced Manufacturing Technology
C	EN0622 Renewable Energy Technologies		

**NOTE: Part time students are given exemption (APEL) for the following level 4 modules: EN0402, EN0146 and EN0416. Y/L = Year long**

## Full-time MEng Mechanical and Automotive Engineering

### Level 4 (Year 1)

EN0100 Introductory Mechanics  20 credits Y/L	MS0265 Engineering Mathematics  20 credits Y/L	EN0402 Introduction to Vehicle Design  20 credits Y/L	EN0416 Engineering Skills in Experiment and Presentation  20 credits Y/L	EN0101 Energy and Environment  20 credits Y/L	EN0146 Materials and Manufacture  20 credits Y/L
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### Level 5 (Year 2)

EN0200 Applied Mechanics  20 credits Y/L	MS0264 Further Engineering Mathematics  20 credits Y/L	EN0204 Computer Modelling and Design  20 credits Y/L	EN0576 Engineering Economics and Professional Skills  20 credits Y/L	EN0507 Powertrain and Chassis Systems  20 credits Y/L	EN0575 Manufacturing Technology  20 credits Y/L
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### Optional placement year

### Level 6 (Year 3/4)

EN0612 Vehicle Dynamics  20 credits Y/L	EN0613 Automotive Control Systems and Mechatronics  20 credits Y/L	EN0614 Automotive Design and Analysis  20 credits Y/L	OPTION module  20 credits Y/L	EN0360 Investigative Project  40 credits Y/L
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### Level 6 Options

A <i>EN0615 Vehicle Aerodynamics</i>	B <i>EN0621 Advanced Manufacturing Technology</i>
C <i>EN0622 Renewable Energy Technologies</i>	

### Level 7 (Final year)

EN0750 Engineering Technology Management  20 credits (SEM 2)	EN0776 Computational Fluid Dynamics and Heat Transfer  20 credits (SEM 1)	MS0702 Applied Engineering Statistics  20 credits (SEM 1)	OPTION module  20 credits (SEM 2)	EN0751 Interdisciplinary Engineering Project  40 credits Y/L
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### Level 7 Options

A <i>BE1397 Low Carbon HVAC Plant</i>	B <i>EN0757 Wind, Photovoltaics and Hybrid Renewable Energy Systems</i>
C <i>EN0771 Product Design and Development</i>	D <i>EN0761 Advanced Internal Combustion Engines and Alternative Fuels</i>

**Y/L = Year long**

## Part-time MEng Mechanical and Automotive Engineering

### Level 4 (Year 1)

EN0100 Introductory Mechanics  20 credits Y/L	MS0265 Engineering Mathematics  20 credits Y/L	EN0101 Energy and Environment  20 credits Y/L
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### Level 5 (Year 2)

EN0200 Applied Mechanics  20 credits Y/L	MS0264 Further Engineering Mathematics  20 credits Y/L	EN0576 Engineering Economics and Professional Skills  20 credits Y/L	EN0575 Manufacturing Technology  20 credits Y/L
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### Level 5 & 6 (Year 3)

EN0612 Vehicle Dynamics  20 credits Y/L	EN0204 Computer Modelling and Design  20 credits Y/L	EN0507 Powertrain and Chassis Systems  20 credits Y/L	EN0613 Automotive Control Systems and Mechatronics  20 credits Y/L
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### Level 6 (Year 4)

EN614 Automotive Design and Analysis  20 credits Y/L	OPTION module  20 credits Y/L	EN0360 Investigative Project  40 credits Y/L
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### Level 6 Options

A	<i>EN0615 Vehicle Aerodynamics</i>	B	<i>EN0621 Advanced Manufacturing Technology</i>
C	<i>EN0622 Renewable Energy Technologies</i>		

**Y/L = Year long**

## Level 7 (Year 5)

EN0750 Engineering Technology Management  20 credits (SEM 2)	EN0776 Computational Fluid Dynamics and Heat Transfer  20 credits (SEM 1)	MS0702 Applied Engineering Statistics  20 credits (SEM 1)	OPTION module  20 credits	EN0751 Interdisciplinary Engineering Project  40 credits
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## Level 7 (Year 6)

OPTION module  20 credits	EN0751 Interdisciplinary Engineering Project  40 credits Y/L
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### Level 7 Options

A	BE1397 Low Carbon HVAC Plant	B	EN0771 Product Design and Development
C	EN0757 Wind, Photovoltaics and Hybrid Renewable Energy Systems	D	EN0761 Advanced Internal Combustion Engines and Alternative Fuels

**NOTE:** Part time students are given exemption (APEL) for the following level 4 modules: EN0402, EN0146 and EN0416. Y/L = Year long

***The modules currently on our courses are outlined in these tables.***

***Please note that more information can be found on the individuals modules by using the module search facility (<http://nuweb.northumbria.ac.uk/live/webserv/mod.php>) on the University web site– here you look up a module by module code (e.g. EN0146).***

## 4.4 Learning Teaching and Assessment Strategy

At all Levels LEARNING and TEACHING take place via lectures supported by small-group seminars (problem-solving classes) or computer laboratory sessions, in which students obtain direct help, from academic staff, with problems associated with a particular module.

Lecturers are free to adopt teaching styles to suit the material delivered, and their own personalities and abilities, and may choose to use distributed materials (including via Blackboard), specified texts, OHP slides, projected material via a PC, lab-based teaching with appropriate software, traditional 'chalk and talk', or combinations thereof.

To support lecture materials, lecturers generally supply students with problem sheets of a routine nature. Students are expected to consider these prior to seminars or laboratory sessions, referring to lecture notes and/or recommended texts. In this way the problem sheets encourage both directed and independent learning. During seminars students attempt problems and obtain help with any difficulties encountered. Seminars also provide a point of contact where both students and staff can reflect on the learning experience.

At all Levels ASSESSMENT takes place via a combination of formal examinations and/or In-Course Assessments, such as individual or group assignments. The form of assessment, and weightings, is specified by the Module Tutor, appropriate to the particular module.

At Level 4 all core modules, Mechanics, Energy, Manufacture and Mathematics, providing vital underpinning, are assessed by a combination of formal examination in course tests and practical laboratory work. This aims to encourage students to develop a good attitude to their studies from an early stage. Students will be encouraged to develop independent learning skills and techniques in Level 4 and these will be used increasingly in levels 5 and 6. At levels 5 and 6 students are increasingly expected to incorporate critical analysis and critical evaluation into their learning. Students will be supported in developing these skills throughout the programme. The development of transferable skills permeates the whole of the programme, particularly with regard to communication and presentation of the results of investigations in an engineering and business environment.

The subject matter is continuously developing, evolving and changing and as a result students will be expected to keep up to date with developments through independent research. The input from guest speakers (practitioners and industry experts) will contribute to the currency of the subject material).

## 4.5 Feedback

Students receive feedback on their progress throughout the year in a number of ways. We aim to mark assignments within 21 days of submission. Class time is usually then set aside to return scripts to students and for lecturers to give general verbal feedback. More specific remarks are written on the front of the assignment, whilst detailed annotations are usually made on the script itself. Students retain individual assignments once marked and moderated. Formative assessment and feedback is incorporated into modules wherever appropriate and students are encouraged to participate in formative assessment (this is not marked but rather is designed to help you improve your work) through linking those activities to personal development plans (PDP) and using the formative activities to develop the skills, techniques and expectations of summative assessment. Summative assessment methods include assignments, exams, technical reports, case study analyses, presentations, portfolio and project work.

## 4.6 Module Options

You will be required to make your choice of any available Options around Easter. The Options actually delivered in any year will be subject to satisfactory demand. The options available are shown in the Programme Structures, see Section 4.3.

## 4.7 Student Representatives

Student Representatives are elected in Induction Week (if possible). Being a Student Representative is a responsible task and one that is important, not only to help the University operate effectively, but also to make sure that you and your fellow students are getting the best experience possible whilst at Northumbria. The students in your Year Group elect the Student Representatives for the coming academic year. The Reps' commitment will be to gather 'issues and ideas' from fellow students and feed these back each semester at Staff Student Liaison Committee (SSLC) meetings with the Year Tutors and Programme Leader and at Programme Committee Meetings with the Programme Management Team. The results of such discussion between the Reps and programme team may then be actioned as appropriate, and results fed back via published minutes and through the Reps.

The main role of the Student Rep is to represent the students in the Faculty on 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.

## 4.8 Industrial Placement

Students without industrial experience are strongly encouraged to undertake a one-year placement in industry (36 weeks minimum). The placement does not contribute directly to the degree classification but will count towards a graduate training programme possibly leading to the CEng professional status and will also result in a City and Guilds qualification. A placement year is found to be invaluable in developing general knowledge and engineering skills. These will be helpful during the final year and often provide a Programme into full time employment after graduation. Students often gain sponsorship (and the offer of permanent employment) from their placement employer. There are opportunities to work abroad for this period.

Over the years the Department has developed close contacts with many companies and will assist you to find a suitable placement. Information on available placements will be issued during year two by the Placement Tutor. You will be strongly encouraged to seek a suitable placement yourself. In this way you are more likely to spend time in the area of engineering in which you have most interest. However you obtain your training place, it is important to remember that you will be employed by the company and have a responsibility to it. Department staff will assist you to gain maximum benefit from the experience. Arrangements for the industrial placement must be made before the end of year two. The Placement Office is located in Pandon Building.



## 4.9 Timetable information

Timetables are subject to change at short notice and should be checked regularly, your 'MyNorthumbria' page will display timetable and other related information.

To check timetables for lectures, labs seminars and EXAMS etc. use the online service at

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

1. Select the programme or module option.
2. For programme enter (where 'x' is the year):
  - 21SENG\_MEE1\_BNN\_x for full time BEng
  - 21SMCG\_MCG1\_BNN\_x for full time MEng
  - 21PENG\_MEE1\_BNN\_x for part time BEng
  - 21PMCG\_MCG1\_BNN\_x for part time MEngfor example year one full time would be: **21SENG\_MEE1\_BNN\_1**

**Note: Laboratory sessions are scheduled by the central timetabling and appear on your "MY Northumbria" approximately 2 weeks prior to the session, it is YOUR responsibility to attend labs and to know which labs you should have from your module tutor!**

## 4.10 Programme Assessment Scheme

### Year 1 (Level 4)

This consists of the following six year-long 20 credit modules with the form of assessment and weightings shown:

**EN0100 Introductory Mechanics and EN0101 Energy and the Environment**

Class test/Laboratory work - 40%, Examination - 60%

**EN0146 Materials and Manufacture**

Class tests - 30%, Examination - 70%

**EN0402 Introduction to Vehicle Design**

Design assignments 50%, Design and build car prototype - 50%

**EN0416 Engineering Skills Experimentation and Presentation**

Portfolio of assignments, presentation and reports integrated with the EN0146 Materials and Manufacture labs – 100%

**MS0265 Engineering Mathematics**

Examination - 100%

### Year 2 (Level 5)

This consists of the following six year-long 20 credit modules with the form of assessment and weightings shown:

**EN0200 Applied Mechanics and**

Assignments / Laboratory work - 30%, Examination - 70%

**EN0507 Powertrain and Chassis Systems**

Assignment - 30%, Laboratory work - 30%, Examination - 40%

**EN0204 Computer Modelling and Design**

Portfolio 100%

**EN0575 Manufacturing Technology**

Class test - 20%, Examination - 80%

**EN0576 Engineering Economics and Professional**

Portfolio - 30%, Examination - 70%

**MS0264 Engineering Mathematics**

Examination - 100%

**Year 4 (Level 6)**

This consists of the following three year-long 20 credit modules, one year-long 40 credit project, and one 20 credit module option:

**Year-long 20 credit modules:**

**EN0612 Vehicle Dynamics**

Assignment – 30%, Laboratory work - 30%, Examination - 40%

**EN0613 Automotive Control Systems and Mechatronics**

Assignment – 30%, Laboratory work - 30%, Examination - 40%

**EN0614 Automotive Design and Analysis**

Individual project - 50%, Group project - 50%

**EN0615 Vehicle Aerodynamics**

Assignment – 30%, Laboratory work - 30%, Examination - 40%

**Year-long 40 credit module:**

**EN0360 Investigative Project**

Draft Document 15%, Project Report 60%, Viva 25%

**EN0621 Advanced Manufacturing Technology**

20% individual assignment, 80% Examination

**EN0622 Renewable Energy Technologies**

Examination – 100%

**Year 5 MEng only**

This consists of the following three year-long 20 credit modules, one year-long 40 credit group project, and one 20 credit module option:

**Year-long 20 credit modules:**

**EN0776 Computational Fluid Dynamics and Heat Transfer**

Individual assignment - 80%, Examination - 20%

**MS0702 Applied Engineering Statistics**

Coursework 100%

**EN0761 Advanced Internal Combustion Engines and Alternative Fuels**

Assignment – 30%, Laboratory work - 30%, Examination - 40%

**EN0750 Engineering Technology Management**

Coursework 100%

**Year-long 40 credit module:**

**EN0751 Interdisciplinary Engineering Project**

Coursework 100%

For options, see module descriptors as explained in section 4.3.

## 4.11 Academic Calendar 2015-2016

### Semester Dates

Semester One Starts Monday 14 September 2015

Semester One Ends Friday 15 January 2016

Semester Two Starts (continuing students) Monday 18 January 2016

Semester Two Ends Friday 20 May 2016

<b>Semester One</b>		
International student enrolment	Friday 11 & Saturday 12 September 2015	2 days
Home student enrolment	Saturday 12 September 2015	1 day
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 07 & Tuesday 08 December 2015	2 days
<b>Winter Break</b>	Monday 14 December 2015 to Monday 04 January 2016	3 weeks
Assessment Weeks	Monday 04 January to Friday 15 January 2016	2 weeks
<b>Semester Two</b>		
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

<b>Spring Break</b>	Monday 21 March to Friday 08 April 2016	3 weeks
Teaching Weeks	Monday 11 April to Friday 29 April 2016	2 weeks
Assessment	Tuesday 03 May to Friday 20 May 2016	3 weeks
Final year results published	Friday 24 June 2016	1 day
Summer Award Congregations <b>(provisional)</b>	Thursday 07 July to Wednesday 13 July 2016	1 week
Reassessment Period	Monday 22 August to Friday 26 August 2016	1 week

Students must note the above dates and ensure their availability to fulfil all academic requirements for their programme of study. Bank holidays during the semester are:

- Good Friday 25 March 2016
- Easter Monday 28 March 2016
- Bank Holiday Monday 02 May 2016
- Bank Holiday Monday 30 May 2016
- Bank Holiday Monday 29 August 2016

#### 4.12 Course work Guidelines

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. Some subjects such as Design are 100% course work, while in many lecture based subjects course work counts for 20-40% of the marks. Briefly the types of course work are:

- Assignment;
- Class Tests;
- Short Laboratory Report;
- Formal Laboratory Report;
- Design Report;

#### Course work Styles

##### **Assignments**

These are usually questions to research and require you to submit a solution. They

may be mathematically based, requiring calculation, or they may involve a technical report on a topic. The lecturer will specify the length of the report that is required and deviating from these guidelines could carry a penalty. References should be presented as in "Cite them right" which is available from Learning Resources. The lecturer will provide a summary of the assessment criteria for your guidance. You will have at least TWO WEEKS to complete each assignment. Sometimes assignments are undertaken in 'test' conditions where you are presented with a question paper and have to answer it immediately. This happens particularly in the first year. These tests are designed to focus your efforts and to ensure that you tackle the tutorial work systematically for each subject. They also give you a rapid feedback on the success of your study pattern, and enable you to judge the pace of work you must maintain in order to cope with each subject.

### ***Short Laboratory Reports***

For each Laboratory session, you will be given information on the theory and the procedure for completing the practical work. You must complete ALL of the data collection before the end of the Laboratory session (2 or 3 hours).

During the session, you will be given a laboratory sheet. For each experiment you may be required to submit the following for marking:

1. The set of results that you obtained during the Laboratory period - on the original piece of paper provided - you should NOT spend time rewriting these results - record them CLEARLY in the first place.
2. Any graphs that you thought necessary or were asked to produce.
3. Any calculations (normally handwritten).
4. Conclusions based on the results and calculations.
5. Answers to the questions on the question sheet.

If a logbook is not being used, the reports must be submitted on A4 paper stapled together, and as a guide it is anticipated that no more than 2 additional sheets per laboratory report will be needed. (The report MUST NOT be placed in any kind of plastic folder or wallet).

Since this Report represents a piece of experimental work which you have done, it follows that you cannot submit a report if you were absent from a particular laboratory REGARDLESS OF THE REASON.

### ***Formal Laboratory Reports***

In the second year you will complete a formal report for a sample of your experiments. Your Tutor will tell you which experiment you have to submit at the relevant time. You must keep full records of each experiment you perform (i.e. a short report, or a detailed LOG BOOK) so that you have the information available for the formal report. Formal reports are deliberately introduced at level 4 and 5 to give you experience of producing the type of report frequently required in industry. It is probable that the reader may not be known to you, or may not be in daily contact with you e.g. a Senior Manager or other Engineers. The department believes that with practice you should learn to write this type of report quickly, concisely and efficiently. This ability will stand you in good stead during your professional career. Two or three reports are required and it is anticipated that you will enter into discussions with the staff supervising the laboratories with the object of improving this skill as quickly as possible.



The reports should be written in a style which can be easily understood by the reader, arouse and hold their interest, and provide a logical and critical analysis of the work carried out.

A good guide as to the type and level of contents of the report is to imagine that you are writing it for a member of your class who has not done the experiment. You are to tell him/her, why, with what, and how you did the experiment, and what you found, followed by a critical discussion of the experiment as a whole and ending with a statement of any definite conclusions you can draw.

### ***Handing work in***

All work that is submitted for marking is handed in via the Faculty Office. 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 proforma (from the office) to attach to the front of the work and fill in the necessary details such as Module Number, Lecturer, Students 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. Staff may require work to be handed in electronically through the e-learning portal but work should not be emailed to staff directly.

### **Late submission of work**

The rules and regulations regarding the late submission of work and personal extenuating circumstances are as defined in the Assessment Regulations for Northumbria Awards (ARNA).

### ***Academic Misconduct***

Any assessed work that is submitted by a student must be their own work and must fully acknowledge the opinions of others. **To assist in this, several modules will use "Turn it in" software to detect possible collusion and plagiarism.** This will normally include the following:

- A full citation of all sources of material used including text and graphics
- Properly referenced sources using a recognized referencing system. Use "Cite them right" available at:  
<http://nuweb2.northumbria.ac.uk/library/skillsplus/loader.html?55388321>

***NOTE: You need your Northumbria login to access this site.***

Full details of the regulations governing academic misconduct can be found in the Assessment Regulations for Northumbria Awards (ARNA) or at:

<https://www.northumbria.ac.uk/static/worddocuments/ardocs/arna.doc>

### ***Calculators***

The Department has identified a range of calculators which have all the necessary functions required to complete all programmes. The allowed model numbers for existing students are Casio FX 83M, FX 85MS, FX570MS, FX 991MS, FX 570 and FX9925, and those recommended for new students are the Casio FX range including the 115ES, 115MSPLUS, 300ES, 300MS, 250HS and 260 models. No other calculator will be allowed to be used in examinations. It is therefore very important that every student has one of the allowed models. They are readily available and cost between £6 - £15.

## **5 Resources and Laboratories**

The Faculty of Engineering and Environment is mainly housed in Pandon Building and Ellison Building and most of your classes will take place in these buildings. Computing laboratories abound – some are open to all University students, such as those in the Library or Pandon Basement.

### **5.1 Laboratory Work**

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 and can be found in **Faculty Handbook**.

#### **Introduction to safe use of Hand & Power Tools including Workshop Cutting Machines**

The Faculty of Engineering and Environment Student code of Practice for Safe Working requires STUDENTS to attend a course on the safe and practical use of hand and power tools including workshop cutting machines.

This compulsory one day course provides instruction in safety, use of drawings and measuring equipment, hand and power tool operations, correct work holding techniques and drilling and sawing operations.

**STUDENTS WILL NOT BE ALLOWED TO ATTEND TIMETABLED LABORATORY SESSIONS OR USE WORKSHOP FACILITIES UNLESS THEY HAVE ATTENDED THIS SAFETY COURSE.**

Non-attendance will result in the LOSS OF MARKS allocated to modules involving laboratory work and the use of workshop facilities.

The course normally takes place within the first 2 weeks of the semester. Attendance dates will be allocated to each student by the programme leader for your programme. If you are a new direct entry (other than first year) student please contact your Year tutor to arrange your training. Alternative dates CANNOT be provided for students who do not turn up on the date allocated.

### **5.2 Personnel Protective Equipment (PPE)**

All Students who wish to work in the laboratory or workshop are required to wear Safety shoes, Lab coat (Blue) and safety spectacles, these will be available during Induction week only. After that Students must purchase their own PPE.

### **5.3 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. To help you with this you are asked to visit the website indicated and take time out to familiarize yourself with the information contained at:

<https://www.northumbria.ac.uk/sd/central/campus/hse/healthandsafety/>

## 6 Supplementary Information

### 6.1 Absence Monitoring

Registers of attendance are taken in scheduled teaching sessions (e.g. in lecturers/seminars/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.

### 6.2 Personnel Extenuating Circumstances (PEC)

If you feel your study or assessment performance has been affected by circumstances that could not have been foreseen and were outside your control, then you can submit a Personnel Extenuating Circumstance (PEC) application. The PEC will then be reviewed at a PEC board prior to the exam boards and if found to have evidence and validity can be considered at progression Exam boards. For instance a long term illness if supported by a doctors sick note, may allow Late Authorized Submission of Assessment (LASA). **Contact the Faculty Office to discuss PEC and LASA prior to the assessment submission deadlines.**

### 6.3 Professional Body

All Mechanical and Automotive Engineering students are eligible to free membership as a student member and graduates of Northumbria University are eligible to apply for Graduate Membership of the Institute of Mechanical Engineers (IMechE). We have a very strong Young IMechE division who provide a seminar programme with invited guest speakers and social events often held within the University. The IMechE also awards prizes each year to our top graduates.



**Link to Young IMechE events this year:**

<http://nearyou.imeche.org/near-you/UK/North-Eastern>

### 6.4 Assessment Regulations for Northumbria Awards (ARNA)

The Assessment Regulations for Northumbria Awards are usually referred to as ARNA. ARNA applies to all Northumbria programmes (or courses) delivered in the UK and overseas. PLEASE FIND THE LATEST ARNA ON THE WEBSITE LINK GIVEN AT THE END.

#### **What does ARNA cover?**

ARNA includes specific rules for full-time and part-time programmes. It also includes regulations and procedures applying to cheating, plagiarism and other forms of academic misconduct (in Appendix 1), and regulations governing examinations (in Appendix 2). A glossary of terms (in Appendix 3) provides further explanation of some of the terms used and defines what ARNA means by a full-time or part-time programme.

#### **Module pass mark (ARNA Section 2)**

- Your programme (or course) is made up of modules
- The pass mark for undergraduate modules (levels 3-6) is 40%

- The pass mark for postgraduate modules (level 7) is 50%
- Some modules are pass/fail and you will not receive a mark.

To pass a module, you must also complete each assessment component defined in the module descriptor. If you do not, you will have failed the module even if you have achieved the module pass mark.

It is your responsibility to ensure that the Exam Board is aware of any extenuating circumstances affecting your ability to complete assessments (see 'what are extenuating circumstances' below).

### **If you are on a full-time programme (ARNA Section 3)**

- If your programme has more than one level ARNA tells you what is required to progress to the next level. This is referred to as **progression** (Section 3.2).
- If you have failed any modules, ARNA indicates:
  - That your average mark is more important than the number of modules you have failed as it determines whether the module failure can be **compensated** (Section 3.3) or whether you will have a **referral** opportunity, i.e. whether you can resit the failed module/s (Section 3.4.1).
  - When a failed module is compensated by the Exam Board, you will not have to resit and will be awarded credit for the module. If you are part way through an undergraduate programme the module pass mark of 40% will also be awarded (Section 3.3.4/3.3.5).
  - When the referral (resit) opportunity takes place (Section 3.4.4)
  - That if you pass the resit, the module pass mark will be awarded although if you are at the award stage of your programme, this will not improve the classification of your award (see *Classification of awards* below)
  - What happens if you fail the programme (Section 3.5)?

### **If you are on a part-time programme (ARNA Section 4):**

- If your programme lasts more than an academic or calendar year, ARNA tells you what you need to do to progress to the next stage of your programme. This is referred to as **progression**. (Section 4.2)
- If you are part-way through your programme and have failed any modules you will have referral or resit opportunities which must be passed before you can progress to the next stage (Section 4.2)
- If you are at the final stage of your programme, up to 20 failed module credits may be compensated, and you will receive your award (Section 4.3). Otherwise, you will be referred in all failed modules (Section 4.4.2).

### **Classification of awards**

If you are on an honours degree, your award may be classified as First, Second Class Honours Upper Division (2.1), Second Class Honours Lower Division (2.2) or Third. Integrated Masters degrees are also classified in the same way except there is no Third class honours classification. Other awards may be classified with Distinction or Commendation. ARNA explains the rules for classification and how the Exam Board will reach a decision for students who are at the borderline between two classifications (Sections 5, 9.11/10.12 and 9.16/10.17).

### **What is academic misconduct?**

In all assessed work you should take care to ensure that the work you submit is your own. The University takes academic dishonesty and cheating very seriously and it is your responsibility to ensure that you don't attempt to cheat or become victim to cheating.

There are many different forms of academic misconduct or 'cheating'. Plagiarism (intentional and unintentional) is most common and both the University Library and your academic tutors are able to provide further guidance on proper citation and referencing in your assessed work.

You will find further information on types of academic misconduct and penalties which the University can impose in ARNA (Appendix 1).

### **What are extenuating circumstances?**

Exam boards take account of personal and technical extenuating circumstances affecting student assessment.

You can apply for an extension of time to complete assessed coursework if you have personal circumstances which are unforeseen and unpreventable and have a serious effect on your ability to submit work by the published hand-in deadline (section 6).

If personal extenuating circumstances which are serious, unforeseen and unpreventable have significantly affected your performance in examinations or other forms of assessment, you can submit a personal extenuating circumstances (PEC) claim (Section 7). You should discuss this with the appropriate guidance staff, who will be asked to comment on the claim. The claim form should be submitted, with medical or other independent evidence, as soon as possible and no later than the published Faculty deadline for the period in which the affected work is assessed (e.g. semester 1). If you are unable to submit work by the assessment deadline, or to attend an examination, you must register intention to submit a PEC claim with the Faculty Office as soon as practicable.

Circumstances which affect the conduct of an examination or assessment for individual students or groups of students are described as **technical extenuating circumstances** (Section 8). If there is a problem during an exam (e.g. there is a power failure), this will be formally reported by the invigilator. If you are the only student affected, you will need to explain the circumstances to the module tutor and Faculty office. If extenuating circumstances are likely to affect your ability to continue studying, you should seek advice from guidance staff.

### **Need to find out more?**

On the Student Hub, under Academic Links, click on 'Assessment Documentation' - in addition to this brief overview, you will be able to access the following documents:

- Assessment Regulations for Northumbria Awards
- Personal Extenuating Circumstances: Student Form
- Personal Extenuating Circumstances: Student Medical Form
- Student Guide to Extenuating Circumstances
- Student Module Record Form (SMRF) – Guide for Students.

They are also available via:

<https://www.northumbria.ac.uk/sd/central/ar/qualitysupport/assess/assproc/assdocstud/>



## **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-nsp>

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?I3-0>

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](http://www.northumbria.ac.uk/ask4help)

[ask4help@northumbria.ac.uk](mailto: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](http://www.mynsu.co.uk) or come and see us at our [offices](#) in City, Coach Lane and London.