

IMPORTANT

The aim of this handbook is to answer the many questions you may have about the different aspects of studying for a degree at the University of Strathclyde. The handbook contains practical information about the University, the Department and your course of study including course regulations, class syllabi and departmental procedures. It is an important reference document which will help you to ensure that your time here is organised efficiently and to maximum benefit.

The University of Strathclyde was formed from the Royal College of Science and Technology and the Scottish College of Commerce, and received its Royal Charter in 1964, both former institutions having had long traditions of involvement in higher education. In the case of the Royal College this dates back as far as 1796. Since receiving its Charter, the University has thrived on the John Anderson Campus in the city centre, with four faculties having developed - the Faculties of Engineering, Humanities & Social Sciences, Science and the Strathclyde Business School.

We believe the information provided in this Handbook is correct at date of publishing but may be subject to revision

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Session 2016/17 - Dates to Note

(up-to-date 'Key Dates' available at <http://www.strath.ac.uk/studying/currentstudent/>)

Semester 1: 12 September 2016 – 06 January 2017

Semester 2: 09 January 2017 – 19 May 2017

Please note that the University is **closed** on the following dates:

26 September 2016

23 December 2016 to 03 January 2017 inclusive

14, 17 April 2017

01, 29 May 2017

14, 17 July 2017

Graduation Ceremonies (*provisional dates*)

22 to 30 June 2017 inclusive

NOTE: Students should register for graduation well in advance of graduation day (usually around three months beforehand) and should check the above Key Dates page or notice boards in the McCance Building for specific dates.

Semester 1 – 2016/17	
Week No.	Date Beginning
0 (W&D Week)	12 September
1	19 September
2	27 September
3	03 October
4	10 October
5	17 October
6	24 October
7	31 October
8	07 November
9	14 November
10	21 November
11	28 November
Exam Period	05 - 16 December
Christmas Vacation	19 Dec'16 – 06 Jan'17

Semester 2 – 2016/17	
Week No.	Date Beginning
0 (C&D Week)	09 January
1	16 January
2	23 January
3	30 January
4	06 February
5	13 February
6	20 February
7	27 February
8	06 March
9	13 March
10	20 March
11	27 March
Spring Break	03 - 17 April
Exam Period	*18 April – 19 May
Resit Exams	TBC 02-15 August

*Honours exams often fall at start of exam period

Section 1

The Department of

Mechanical & Aerospace Engineering

Welcome

From the Head of Department

It is my very great pleasure to extend a warm welcome to new students joining the Department of Mechanical and Aerospace Engineering (MAE) and to welcome returning students back to the department after what I hope was an enjoyable and refreshing summer break.

Engineering is a fascinating, stimulating and rewarding career. Engineers are always in demand and in a very wide range of settings. Your engineering education will stand you in the best possible stead and open doors in all sorts of organisations or indeed equip you to start one of your own. Modern life has been shaped by engineers and they are always at the forefront when new challenges emerge. I think the 21st century will be replete with challenges as fierce as any society has ever faced and that engineers, as usual, will be in the vanguard. In short, I think it's a great time to be an engineer and to study engineering.

For those of you new to the subject and to studying at university you will find the learning environment rather different to that at school or college. Indeed adapting to studying in a university setting can, at the start, be almost as challenging as the technical content of the programme of study itself. I urge all students to think carefully about how you manage your time and to try and develop effective study methods. If you do and if you approach your studies with diligence, commitment and intelligence, you will build an excellent platform for success both in your studies at Strathclyde and in the fulfilling career that follows. Furthermore, with good time management and study technique there should be ample time for you to enjoy everything that life at university has to offer and I encourage you to do just that!

This handbook will provide you with guidance on the operation of the department and is designed to assist you with your studies and to let you know how and where to seek help should you need it. It gives contact information for all the people in the Department, and details the requirements and regulations for the Department's degree courses. Your Year Adviser of Studies can help clarify regulations and academic requirements and your Personal Development Adviser can help deal with any problems you may encounter. You can also get help and advice on specific classes from individual lecturers and class registrars. Please let your Student Representatives know about any persistent issues, and they will convey these to us through regular meetings of the Staff/Student Committee. If you wish to talk to me about any issues, please email Donna Fairley (donna.fairley@strath.ac.uk) to arrange a suitable time for us to meet.

I hope you find the coming academic year challenging, enjoyable and rewarding and I look forward to getting to know you and to working with you.

Prof Andrew Heyes

People in the Department

PLEASE REFER TO THE UNIVERSITY DIRECTORY (<http://but.mis.strath.ac.uk/Teldir/control/search>)

or MAE 'FIND A MEMBER OF OUR STAFF' WEBPAGE

(<http://www.strath.ac.uk/staff/?department=Mechanical%20and%20Aerospace%20Engineering>)

FOR FULL DEPARTMENT STAFF NAMES AND CONTACT DETAILS.

Departmental academic staff can be found on Level 8 of the James Weir Building.

(please report to Central Services Reception on arrival prior to meeting staff)

Head of Department: Prof Andrew Heyes

Deputy Heads: Prof David Nash / Prof Massimiliano Vasile

UG Course Director: Dr James Boyle

Director of Education / PDS Co-ordinator: Prof Matthew Cartmell

UG Administrator: Mrs Donna Fairley

See next page for UG Year Adviser information.

Student Support Services

Where to find help

There are numerous support services within the University and these are detailed on the University's 'Strathlife' student page at <http://www.strath.ac.uk/studywithus/strathlife/>.

In this section of the Departmental Handbook, we explain where you can find support within the Department of MAE.

Course Director and Year Advisers

There is an Adviser of Study for each year of your course, in addition to the UG Course Director. The aim of the Adviser is to counsel you on aspects of your current year (in particular academic queries) and to assist you in choosing optional subjects to study.

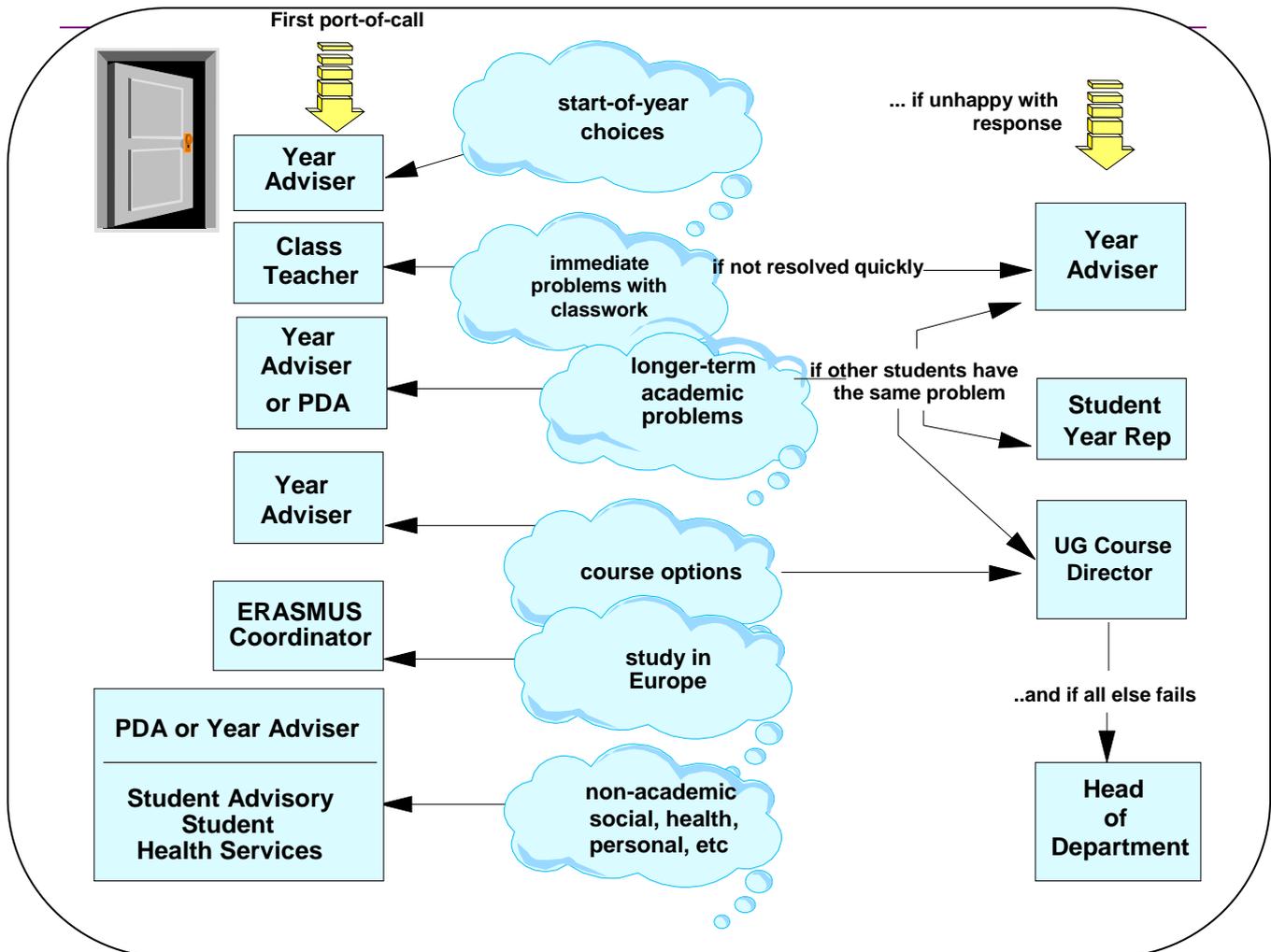
First Year Adviser	Prof James T Boyle
Second Year Adviser	Prof Donald Mackenzie
Third Year Adviser	Mr Cameron Johnstone
Fourth Year Adviser	Dr Marcus Wheel
Fifth Year Adviser	Dr Mónica Oliveira
Course Adviser (Mechanical)	Prof James T Boyle
Course Adviser (Aero-Mechanical)	Dr Matthew Stickland
UG Course Director (all programmes)	Prof James T Boyle
Deputy UG Course Director (all progs)	Dr Barbara Keating

Staff-Student Liaison Committee (SSLC)

A Staff-Student Liaison Committee, which normally meets twice per year, provides a forum where academic problems may be raised by student representatives. Students are encouraged to consider the benefits of becoming a Student Rep, further information on which can be found from the USSA at www.strathstudents.com.

Departmental Student Reps are encouraged to run the SSLC, which normally comprises two reps from each year, the Director of Education, Year Advisers of Study plus senior members of staff or others as appropriate. When selected, the names of reps will be notified to all students. If there is an issue which is important to a large number of students and you believe should be discussed at this Committee, you should inform the Student Rep for your year so that it can be placed on the agenda for the next meeting. However, before the issue is brought to the meeting, it is IMPORTANT that it has first gone through the proper 'Problems' channels which follow. Only once there has been no satisfactory resolution of a problem should it be brought before the SSLC.

Problems? - Where to go



Personal Development Scheme

A student Personal Development Scheme exists, the objectives of which are to create an environment where students are able to discuss freely and in confidence any personal matters. Staff provide advice either personally or, if the student is agreeable, through another specialist member of staff. Few students encounter substantial difficulties but for those who do it is hoped this scheme will ensure academic welfare and encourage satisfactory progress with your studies.

The success of the scheme depends on the participation of both staff and students. Students are encouraged to see their PDA at least once every semester, even if only to confirm that all is well.

Disability Service

If you have, or think you have, a disability you should disclose it as soon as possible. This will enable you to access any additional support that you may need. The information you provide will be treated as confidential and will not be shared with other staff without your consent. The University has a dedicated Disability Service that offers specific advice, information and assistance. For information on this service please refer to the 'Strathlife' student webpage.

Prof Matthew Cartmell is the Departmental Disability Coordinator/Contact.

Donna Fairley is the Departmental Examinations Coordinator for students with disabilities.

If you believe you qualify for special exam arrangements, then you must visit the Disability Service. **Requirements must be in place several weeks prior to the start of examinations.**

Educational Policy

Course Aims and the Learning Experience

Your aim in choosing your degree course is undoubtedly to graduate and qualify as a competent professional engineer. Our aim is to assist you in the best ways we can to achieve that goal. There are various elements of knowledge, skills, experience and understanding which are to be found in competent engineers and your course will give you the opportunity to acquire and develop these. By the end of your course, we expect that you will:

- have a good working knowledge of the fundamentals of systems and processes which are generally recognised to be in the domain of mechanical engineering and its related subjects;
- be able to understand, model and predict the behaviour of engineering artefacts through the application of scientific and technological principles;
- have had a great deal of practice in creating new solutions, adapting old ones, and in using your acquired knowledge in materials, energy systems, manufacture and computer-aided design techniques.

We also expect you to develop many new capabilities which are not simply concerned with engineering technology; in fact we will be disappointed if your outlook does not change radically during your course. In particular, we expect that you will:

- continue to develop the capacity you already have to learn about many things - a good engineer can do anything;
- increase your skills in communicating and working effectively with others - engineers work in teams and lead teams;
- grow to understand your place as an engineer in a complex and fascinating professional community - the world is your oyster.

Student Charter

Departmental staff aim to:

- be responsible and responsive in all matters related to students
- respect individual students as partners in the learning process
- maximise learning opportunities
- minimise bureaucracy and ensure the transparency of procedures
- maintain a friendly and caring environment
- operate an efficient information system
- identify clearly the responsibilities of staff and students
- facilitate innovative developments where appropriate
- ensure equality of opportunity for all

Assessment and Feedback

The Department fully subscribes to the approach to Assessment and Feedback stated by the University, <http://www.strath.ac.uk/learn/learn/informationforstudents/students/assessfeedback/> and elucidated in the 12 Principles of Good Assessment and Feedback, <http://www.strath.ac.uk/learn/learn/informationforstaff/staff/assessfeedback/12principles/>.

Accordingly, assessment and feedback methods used by each class are explicitly stated in the associated Module Descriptor Form (MDF). Up-to-date MDFs can be found on our MAE webpage at <http://www.strath.ac.uk/engineering/mechanicalaerospaceengineering/student-information/>. The Department also recognises that, in addition to constituting a formal response to assessment, feedback also incorporates informal communication between staff and students (either individually or collectively) that provides information on progress and performance. This implies a more bilateral process in which students are encouraged to seek feedback by actively engaging with staff as appropriate.

Engineering Profession

All courses in the Department are designed to lead to Chartered Engineer (CEng) status, in that they are accredited by one or more of the professional institutions in the Council of Engineering Institutions. It is your responsibility to exploit this benefit, although staff here will be pleased to help you with advice, form-filling and so on.

The paths to CEng registration are given in an Engineering Council publication – UK SPEC - which defines the initial education required and the subsequent stages of education, training and experience needed to achieve full membership. For those students who entered courses in 2000 or later, the MEng courses provide the only direct route to Chartered Engineer status, without further academic study. BEng (Hons) courses fulfil the CEng requirements in part, but graduates of these courses will require, under current Engineering Council rules, to complete a so-called 'Matching Section' of further study - equivalent to one year of full-time study, approximately.

In any event, you are strongly recommended to begin your own developing association with the professional body you choose by joining up now. It costs little (Student Membership is sometimes free for students on accredited courses). You will keep abreast of changes in UK SPEC and your time as a student will be credited to you when you eventually apply for full membership.

Useful Administrative and Other Information

MAE Department's Central Services / Reception

All general enquiries should be directed in the first instance to Central Services/Reception on Level 8 of the James Weir Building. Student opening hours, which may be subject to change, are:

Monday – Friday: 1000 - 1600

Class lecturers should indicate submission dates for coursework. Where possible coursework will be submitted electronically but failing that it should be submitted via Central Services/Reception during opening hours. The lecturer for each class will either provide students with a front page for submitting coursework or enable you to download one from Myplace <http://classes.myplace.strath.ac.uk>. Coursework cannot be handed in without a front cover sheet.

Marked paper coursework submissions can be picked up from student boxes located near JW801.

Access to Buildings

If you wish to access University premises out-with normal hours (0800 – 1800) it is important that you read Appendix 2 of this Handbook. All students must complete the appropriate form.

For access to computer rooms it will be necessary for you to have a 'Red Card' signed by a member of staff in Central Services.

Thereafter the card must be taken for counter-signature to the Information Technology Services (ITS) Helpdesk, level 3 of the University Library.

Normally we can guarantee your obtaining a card if your request is made within Central Services opening hours, but you should be aware that certain staffing situations can prevent this. Therefore, you must plan ahead and not leave it until late on a Friday afternoon to ask for a card.

If you experience an issue with physical access anywhere on campus, please email: physicalaccess@strath.ac.uk where a member of Estates staff will be able to help.

Change of Address

Students are required to notify Student Experience of any change in your permanent home or term-time addresses. Student Experience can send several letters to each undergraduate student every year. It is therefore important that they have the correct home and term-time addresses. Students can update their personal details via Pegasus.

Email Accounts

You must check your '@strath' email account on a regular basis to ensure that you do not miss important announcements. Emails should also be cleared out regularly as communications cannot be received when your account has reached capacity.

Graduation

Award Ceremonies (or Congregations) are normally held in June/July and October/November. All students hoping to graduate or be presented must enroll to graduate by completing a form and paying the appropriate fee. Details of the ceremonies and enrolment forms are usually available from Student Experience in March each year. See <http://www.strath.ac.uk/studywithus/graduation/>

MAESA

MAESA is the Mechanical & Aerospace Engineering Students Association. It is run by students, for students who are undertaking courses in the Department and is comprised of undergraduates across all 5 years. If you're looking for a way to be part of the Mechanical and Aerospace community outside of your studies, then get involved with the committee as a volunteer. Being part of MAESA allows students to build on existing skills, develop new ones, gain new experiences and meet new people.

Being a student group, MAESA rely on your involvement to host events. If you're not able to be involved directly, you can always support the group in other ways. Suggestions for new events or new ideas can be sent to maesa.strath@gmail.com.

References

Frequently companies will ask for referees who can comment on your academic progress as well as on your general conduct. You should ask your Project Supervisor (where applicable), Year Adviser or perhaps your Personal Development Adviser to act as a referee.

(The) Sir William Arrol Bursary

This bursary is available to first year students in the MAE department. The recipient will receive £1000 per year for the 4/5 years of their course. All first years are invited to apply via an application form obtainable from Central Services. Completed forms must be returned by the end of November each year.

Sponsorship

Student sponsorship is reasonably common within the Faculty of Engineering – see <http://www.strath.ac.uk/engineering/scholarships/>. The advantage is that a company will usually supplement a student's income and offer employment during the summer vacation. There may also be the possibility of graduate employment on completion of studies. Students in 1st, 2nd or 3rd year may find it worthwhile to spend some time identifying companies willing to offer sponsorship. Look out for those that operate a sponsorship scheme – check the notices in the Careers Library, the department or newspapers. If unsure whether a particular company operates a sponsorship scheme, write to their Human Resources Manager requesting information.

Student Experience

Student Experience is based on Level 1 of the McCance Building. All changes to classes/courses **must** be notified to Student Experience **by your department** (please contact your Year Adviser). Student Experience hours of opening are:

Monday-Friday: 1000 to 1600 hours

Out-with these times, information and forms are available on a stand outside Student Experience and much of the information/forms you may require are available on the Student Experience website at:

<http://www.strath.ac.uk/sees/> or <http://www.strath.ac.uk/studentlifecycle/>

Student Complaints

Please refer to the website for the complaints procedure.

<http://www.strath.ac.uk/staff/policies/academic>

Use of Computing Facilities and Resources

The University will not permit the use of its computer facilities and resources for access to, or transmission of, information which is considered by the University to be unacceptable; illegal; in breach of university policies, such as those on Equal Opportunities and Harassment; wasteful of resources or not commensurate with the provision of facilities for legitimate educational purposes.

Examples of such unacceptable use may include:

accessing/displaying pornographic material; stating defamatory opinions/views concerning individuals or organisations; accessing/displaying discriminatory material or material which encourages discrimination; engaging in games or chain E-mail; publishing information which is intended to misinform and thereby causes anxiety or inconvenience to another; unauthorised use of University logos, titles etc; spamming; corrupting or destroying another user's data; violating the privacy of other users; disrupting the work of others; using JANET in a way that denies service to others; misuse of networked resources such as the introduction of viruses.

The University actively monitors usage of the University computer facilities and resources which includes monitoring the access to, publication or receipt of, any Internet materials by any user.

General Information - summary

General Course regulations are published on the University web-site at:

<http://www.strath.ac.uk/sees/educationenhancement/qualityassurance/universityregulations/>

Policies and Procedures for students are published on the University web-site at:

<http://www.strath.ac.uk/sees/studentpolicies/>. These include:

- Absence and Voluntary Suspension
- Academic Appeals
- Personal Circumstances
- Student Discipline
- Academic Dishonesty
- Assessment and Feedback
- Compensation Scheme and Progress
- Honours Classification & Other Awards Rankings
- Motivation Merit & Distinction
- Careers, Education, Information, Advice & Guidance
- Dignity & Respect (inc Equality & Diversity)
- Charging for Course Material
- Internal Review of Learning & Teaching
- Role, Selection & Briefing of Student Members of Review Teams
- Research: Code of Practice on Investigations Involving Human Beings
- Student Representation

Absence and Personal Circumstances (key points to note)

The following procedures and regulations relating to absence through illness should be noted:-

- Students must sit all assessments/examinations unless prevented by illness, in which case a medical certificate must be produced as documentary evidence. Personal Circumstances must be notified to Student Business **within five working days** of the latest affected examination or date of submission of affected assessment. Self-certification is not sufficient.
- Failure to attend due to being “unaware of the dates or times or submission deadlines” of examinations and missing an examination due to “misreading the timetable or oversleeping” are not valid reasons for non-attendance. An ‘Absent’ will be recorded in such situations (refer to the Personal Circumstances policy).
- Students whose performance has been, or will be, affected by circumstances that are severe and outside their control should **inform the University as soon as they are aware of these circumstances** by recording them on Pegasus under ‘Personal Circumstances’ (clearly state the extent, duration and nature plus how they are affecting performance) and by also

submitting **supporting documentary evidence to Student Business**. In addition, Students should provide details on adverse circumstances to their Year Adviser.

CIRCUMSTANCES THAT WILL NOT BE CONSIDERED

Personal Circumstances Boards (PCBs) will disregard circumstances which a student could reasonably have avoided, where measures should have been taken to reduce their impact or where circumstances are no different from those facing a significant number of other students (which you are expected to cope with as part of a properly managed workload). Computer problems, failure of a single data source or lack of back up are not acceptable grounds for discounting attempts or appealing.

If a student does not submit Personal Circumstances via Pegasus, they will not be considered by the PCB or subsequent Exam Board. In **NO** cases will a notification of circumstances be accepted after the PCB has met and students cannot appeal if they fail to report them prior to Exam Boards.

Finally, poor attendance makes the course more difficult and is usually associated with poor performance. If a student has to miss classes for any good reason (medical, domestic, etc) he/she must inform their Year Adviser in writing.

Examination Boards (key points to note)

There are two types of Examination Board: the Final Year 'Honours' Board and the General Board.

The Honours Board of Examiners meets at the end of each academic session to review the performance of all final year students. A decision is made at the Board on the class of degree to be awarded to each student. Following the Board meeting, results are made available to individual students via PEGASUS.

The MEng degree may be awarded 'with Distinction' or 'with Merit'.

Students can graduate from the BEng degree with one of five classifications:

- First Class Honours
- Second Class Honours (Upper Division)
- Second Class Honours (Lower Division)
- Third Class Honours
- Pass

The General Board of Examiners considers the performance of all students other than those in their final year. The General Board meets first at the end of each academic session (after the Honours Board) and analyses students' performance in all degree examinations, whether taken in semester 1 or semester 2. The Board makes one of the following decisions:

Pass - clear passes with no re-sits; should proceed to the next year of study.

Withdraw - student will be instructed to withdraw from the course.

Re-sit (June Board only) - student must take re-sit examinations in August, after which a decision will be made on possible progress to the next year of study.

Overseas Semester(s) (June Board only) - student has taken part in overseas exchange and some marks are not yet available.

May Proceed (September Board only) - may proceed to the next year of the course, but must take further re-sits in those classes which (s)he has failed.

Do Not Proceed (September Board only) - student has not satisfied the requirements for progress to the next year of the course and will be required to enter academic suspension. (S)he may take re-sit examinations in the coming academic session.

Re-attend - student has not satisfied the requirements for progress to the next year of his/her course. (S)he is required to re-attend the current year (for which the standard tuition fee will be charged) before a further decision will be made by the Board regarding progress.

Transfer - student will be transferred to another course. This can be qualified by a decision of **Transfer and Suspend** or **Transfer and Resit**.

In addition to making one of the aforementioned decisions, the Board may also decide to either:

i **caution** a student whose performance has been poor. In this case, the student will be informed that their poor performance gives cause for concern and they should consult with their Year Adviser of Studies.

or

ii **warn** a student that (s)he has almost exhausted their attempts at a class and that (s)he will have just one further opportunity to obtain a pass.

A student may be transferred from the MEng to BEng Hons stream or from the BEng Hons to BEng Pass stream if not performing at a high enough level.

Unusual circumstances can dictate that a student receive a 'Special Letter, outlining his/her academic position as determined by the Examiners.

Students who do not pass all compulsory classes after exhausting their maximum attempts must be withdrawn, though some may be eligible to transfer to the BEng Engineering Studies pass degree.

Faculty Compensation Scheme

The Faculty operates a Compensation Scheme which is designed to assist Boards of Examiners to take decisions about student progress at the end of each of the first, second and third years of undergraduate study and the first four years of an integrated Masters degree. Fail marks in the range 30-39% may be eligible for compensation under the scheme and converted to a pass provided the weighted credit average across the students prescribed curriculum is 45% or higher. Up to 20 credits may be compensated in this way. The scheme can be applied only to the student's first attempts and, therefore, is normally used only at the June meetings of the Boards of Examiners when the results from the semester 1 and semester 2 degree examinations are considered.

Study Abroad

The Department encourages all suitably qualified students to consider the benefits which foreign study brings to the learning experience. Students who wish to participate in exchange are ambassadors for the Department and the University, and should note that it is **IMPERATIVE** that prior permission, in principle, to pursue study overseas is obtained from both the Year Adviser for the year when they will be overseas (usually the Year 3 Adviser) and the Department's Outgoing Exchange / ERASMUS+ Coordinator, Dr Andrew McLaren.

Normally this will be covered by their signature on the Learning Agreement which has to be completed by all students wishing to study overseas. Only once results are known will this permission be ratified as explained at (c) below.

Those students enrolled on courses which require foreign study as part of the requirements for the award of their degree, should be aware that such study can only proceed where the student has reached an appropriate standard and has a reasonable expectation of benefiting from the experience; if this poses a difficulty it is possible to change to another, related course where foreign study is not obligatory.

For those participating in an exchange programme, attention is drawn especially to the following:

- (a) FEES: Do not forget to apply for your fees for the subsequent academic year. You should write to Student Experience in March asking them to send you an application form.
- (b) EXAMINATIONS OFF CAMPUS/OUTWITH THE UNIVERSITY: Please see page 25.
- (c) While the Department encourages students to participate in overseas exchange studies in their third year (and additionally in fifth year), it is important in the case of second year students that, prior to embarking on an exchange programme, the following objective must be met:
 - all first and second year classes have been passed

This is especially important in the case of non-European exchange studies, not simply from an academic point of view, but also from a practical viewpoint. The large time difference involved in international exchanges makes it difficult (and in most cases impossible) for students to take a resit examination overseas.

While agreement to participate in an exchange programme may be given in principle before the end of the academic year, it is imperative that the student concerned has this agreement ratified **in writing** by Dr McLaren, as soon as their examination results are known. **Without this ratification no student from the Department of Mechanical & Aerospace Engineering will be considered to have the necessary permission to embark on an exchange programme.**

ERASMUS+

What is it?

ERASMUS is the name given to the **EuRopean Community Action Scheme for the Mobility of StUdentS**. It forms a major part of the efforts of the European Union to ensure that graduates within its member countries should be able to function on a Union-wide basis within the single European market.

What is Strathclyde's involvement in it?

The University (and in particular the Department of Mechanical & Aerospace Engineering) has entered into the scheme in a comprehensive way because it believes firmly in its overall aims.

What does the scheme involve?

The scheme provides a wonderful opportunity for students to spend part of their degree course at a university in another country within the European Union. This study elsewhere counts as a normal part of the degree curriculum. The various schemes have therefore been designed to ensure complementarity with studies which the student would otherwise have taken if he or she had remained at Strathclyde. Where language permits, students can attend lectures in their European university. Alternatively, for those with less well-developed language skills, project work may be undertaken in the host University in collaboration with a supervisor who speaks English.

Credits are awarded for overseas study just as they would be at Strathclyde and are normally awarded at the September Examination Board once transcripts have been received from the partner institution. Since performance in earlier years of the course contributes to the class of Honours, for this purpose, each student will be awarded an overall grade for their period of foreign study which will be agreed between the ERASMUS Coordinator and the Adviser of Studies.

The minimum length of an exchange is three months and the maximum is a full academic year.

Is language not a difficulty?

The Faculty has recognised that proficiency in another European language is highly desirable for the success of any student exchange. Arrangements have therefore been made with the Language Learning Centre to offer specially designed classes in French. These classes are pitched at different levels to take account of previous knowledge (ranging from nil to passes in Highers). They are normally taught in small groups and aim to teach spoken and written language in an enjoyable and relevant way. These classes are recognised by all courses in the Faculty as "approved elective classes". Classes in other European languages may also be available. During the period of the exchange itself, language tuition is normally provided by the host university. This may include basic classes in languages such as Danish and Swedish. If you think you may be interested in participating in a European exchange programme you should ask your Year Adviser about the elective classes on offer from the Language Learning Centre.

What are the benefits for me?

While the exchanges usually mean hard work when you are there, they can also be enormous fun. Strathclyde students have taken the opportunity to travel, to spend time with students from their European university and sometimes to obtain relevant vacation employment in Europe.

How much does it cost me?

A supplementary grant is provided by the ERASMUS+ Scheme to help towards travel and higher living costs. It should be stressed that this grant is a supplement and not a substitute for your normal funding arrangements. Even although you are studying overseas, it is important to ensure that you have applied for fees through your normal funding body for the academic year in which you will be spending time overseas, and that you are properly registered, otherwise you will not be eligible for a student loan.

When can I go?

Students presently in second year may opt to spend all or part of their third year abroad; exceptionally it may be possible to spend part of the fifth year overseas. What you do abroad is normally agreed beforehand, and may be a combination of lectures, labs and project work, depending upon the courses on offer and your facility with languages. All MEng students are expected to consider going abroad at some stage during their course. This is an essential element in their personal development.

There is much to be said for starting your time abroad in semester 1, if possible, since you can go early enough to check out the social scene, lecture schedules, etc, before classes start. If you want to pursue classes in Germany, you may need to go in semester 2 - project work can be carried out in either semester. Studying abroad for the whole year is by far the most beneficial and is an absolute must for France.

How do I find out more?

Almost all you need to know about ERASMUS+ can be found at <http://www.strath.ac.uk/rio/exchangestudyabroad/goingabroad/erasmus>. This gives links to our partner institutions. Student Grant Contract forms and the Learning Agreement mentioned above may be obtained from MAE Central Services. The deadline for completion of both of these forms is usually **30 April**.

Further information on European exchange arrangements is available from the Department's Outgoing Exchange / ERASMUS Coordinator Dr Andrew McLaren andrew.mclaren@strath.ac.uk.

The Course

General Course regulations are published on the University web-site at:

<http://www.strath.ac.uk/sees/educationenhancement/qualityassurance/universityregulations/>

Core Curriculum

The Department of Mechanical & Aerospace Engineering courses are organised through a number of principal themes depending on which course is undertaken e.g. Materials/Engineering Manufacture and Design, Mathematics and Computer-Aided Engineering, Engineering Science and Applications, Professional Management Studies.

For example, fundamental topics which underpin the practice of mechanical engineering develop through the themes of Mechanical Engineering Science and Applications. Mathematics and Computer-Aided Engineering studies provide competence in the use of modern, analytical IT tools; appreciation of Materials, Manufacture and Design complements the base of fundamentals. More specialised topics relating to the degree in Aero-Mechanical Engineering have an increasing presence after the second year. The individual topics are progressively integrated over the duration of the courses, Engineering Design being the unifying theme in the third year. In the fourth year, the skills, knowledge and understanding developed earlier are brought to bear on a practical project. Specialised studies, in particular Engineering subjects and a Computer-Aided Engineering class based on industrial software, round off the final years of the course.

Engineering is pursued within a Business climate and the theme of Professional and Management Studies is an essential ingredient of preparing to operate as a competent engineer.

4/5 Year Course Structure

The MEng provides the opportunity for students of above-average ability to enhance their studies in alternative ways. For example there are Masters level classes in a wide variety of Engineering topics but it may also be possible to take classes from the extensive portfolio offered by the Strathclyde Business School (popular classes include Accounting and Financial Management).

The main reason for most students to pursue the 5 year MEng option is to complete the educational requirements for Chartered Engineer status before graduating and therefore to avoid the need to return for further study at a later stage. The option to graduate after four years with a BEng Honours award is open to all students and many employers traditionally take on such graduates with a view to further in-house training which may also provide a route to Chartered status. However, current experience is that such employers look for a good class of degree and evidence of a well-rounded portfolio of achievement.

Transfer between Courses

The Department operates a policy which allows students to delay final degree choices until their career aspirations have been determined. Normally such transfers can be delayed until the start of the third year of the course.

It is normally possible to transfer from the BEng course to the more demanding MEng stream. To transfer to (and remain on) the MEng stream, students must achieve a credit weighted average (CWA) of 60% or above for their curriculum in an academic year. Any student who may wish to consider such a transfer should seek advice from their Year Adviser.

Such students should note that in addition to meeting the progress Regulations, transfers require the approval of the Board of Examiners. This approval will readily be granted provided that a student has achieved the necessary 60% or above CWA for the academic year. Conversely, students registered on the MEng courses will be required to transfer to the BEng stream if their performance is not at the required standard (i.e. those with a CWA of lower than 60%). Further

advice on all such transfers may be sought from the UG Course Director.

Note that it is also possible to change courses between the major discipline areas such as Mechanical, Aero-Mechanical and Mechanical Engineering with International Study. Such major changes are usually only possible in the earlier years of the courses. Changes at the end of first year usually present few problems (although are conditional on satisfactory progress). Major changes of direction become progressively less viable if delayed. If in doubt, take advice from the Director of Education.

Course Regulations - Guidance Notes

You are encouraged to consult the Regulations governing your course on a regular basis. The Regulations set out the framework for your studies and specify the criteria for your progression through the course. The language is carefully chosen to cover all eventualities and may need some interpretation or clarification. The following notes do not stand in place of the Regulations but are merely intended to explain the terms used or the thinking behind the text.

There are two main streams; MEng and BEng Honours. The MEng course is intended for high achievers and can be expected to be challenging. It is a five year course. The curriculum is mainly common with BEng in the early years but different progression and award criteria may apply. You should make yourself familiar with all of these.

Registration/Curriculum Choice

Please note that it is your responsibility to ensure that you are registered correctly. If you take a class but have not registered officially for that class you will not be awarded the credits. Conversely, if you register for a class then do not take it, you will be recorded as having failed unless you delete the class from your record before the curriculum change deadline.

1. The standard curriculum for full time undergraduate students is 120 credits per academic session.
2. Exceptionally, an extra 20 credits per year may be taken, subject to approval of the Course Director.
3. Compulsory classes cannot be substituted, and where additional optional classes are taken, the overall mark will be based on performance in all classes attempted.

Coursework

Try hard to keep up with your coursework - it is important. If you miss the deadlines without satisfactory reasons, you may find that your assessment for that class is heavily compromised. Only you can judge if you can afford to lose marks which might affect either your progress on the course or your final assessment. It should be noted that penalties may be incurred for late coursework. In any event, all coursework should be submitted not less than 3 weeks prior to the relevant Examination Board.

Progress

Progress on the different streams is based on the accumulation of credits for which the pass mark is normally 40% (note: level 5 subjects require a pass mark of 50%). This is the minimum acceptable for credit accumulation; however, it is important to note that students on Honours and Masters courses are expected to perform at a substantially higher level.

To progress to the next year of the MEng Degree course, **a credit-weighted average (CWA) of 60% minimum is required**. If a student's CWA drops below 60%, they will be moved by the Examination Board to an appropriate BEng Degree programme, provided all other progress requirements have been satisfied. It is important to understand that, at the end of fourth year, if appropriate, failure to maintain this standard can result in the requirement to transfer from MEng to BEng and graduate immediately.

Award of the degrees

It is important to understand that your performance in the earlier years of your course can have a bearing on your final award. This means that continued high performance will be rewarded but with emphasis on the later stages of the course. You should also be aware that, in line with recommendations of the accrediting institutions, the performance to be taken into account is based on **first diet assessment**. The mechanism for calculating your final marks is given below.

Mechanical Engineering

BEng

Composition of final mark:	15% of Year 2 mark 25% of Year 3 mark 60% of Year 4 mark
Year 2:	Credit Weighted Average of first attempt at compulsory credits.
Year 3:	Credit Weighted Average of first attempt at compulsory credits. External study has been assigned a mark.
Year 4:	120 credit curriculum: Honours mark composed of 25% of the Y4 Individual Project (ME409/ME420) plus 75% of credit weighted average of remaining compulsory credits. 120 + credit curriculum: Honours mark composed of 25% of the Y4 Individual Project (ME409/ME420) plus 75% of credit weighted average of remaining compulsory and elective credits.

MEng

Composition of Final Mark:	15% of Year 2 mark 25% of Year 3 mark 60% of Year 4/5 mark
Years 2 and 3:	As BEng
Year 4/5:	Credit Weighted Average of all credits taken over Years 4 and 5, including compulsory credits.

BEng/MEng (following direct entry to 3rd year)

Composition of Final Mark:	25% of Year 3 mark 75% of Year 4/5 mark
Year 3:	As BEng
Year 4/5:	Credit Weighted Average of all credits taken over Years 4 and 5, including compulsory credits.

Classification of awards

The Honours bands may vary slightly from year to year at the discretion of the Final Honours Examination Board on the advice of the External Examiner. To let you know what to aim for, the bands will normally be of the order of:

BEng	1 st	≥ 70%
	2.1	60-69%
	2.2	50-59%
	3rd	40-49%
MEng with Distinction		≥ 70%
MEng with Merit		60 – 69%
MEng		50 – 59%

Proctoring/Second year project elective

A scheme exists whereby second year students may choose a ten credit project elective which involves assisting final year project students. This enables the final year student to gain experience in managing and supervision while the second year student gains an insight into the final year project requirements. Students are strongly encouraged to consider this option.

Examinations (General information)

It is important to note that:

- students **MUST** be available for exams during all of the exam periods/diets and should therefore not book any holidays that fall into these periods. Published exam dates may change and therefore **you must not make arrangements to leave the area prior to the official end of examination periods**. No special arrangements will be made in such cases.
- students will normally be given two attempts to pass classes during the course of the academic year. Students who fail to complete a class at the first attempt will be given one additional assessment opportunity before the September Board of Examiners. This will either be a re-submission of coursework or a formal examination in the August diet (as detailed in the class Module Descriptor Form).
- those who are permitted to carry over classes to subsequent years will be given the opportunity to resit them during the following academic year. Students should note that failure to pass any compulsory class after four attempts will result in withdrawal from the degree. **NOTE: for Level 4 and 5 classes, only ONE resit attempt is allowed (i.e. two attempts in total).**

Please check the Student Experience and Enhancement Services (SEES) webpage <http://www.strath.ac.uk/exams/> for further examination information.

Resit Attempts

If a student does not pass a particular examination then it is essential to resit at the next examination diet or at the next available opportunity (or complete supplementary work to a satisfactory standard) so that eventually the total credits required for the final degree can be accumulated.

Note: although Examination Boards normally allow undergraduates two attempts to gain a particular credit, such attempts must be at two consecutive offerings of the examination. It should also be noted that **the marks used for the purpose of determining final Honours or MEng degree classifications are based on those obtained at the first attempt.**

External Examiners

Dr Robert Cripps (Deputy Head of School/Head of Learning and Teaching), from the School of Mechanical Engineering, University of Birmingham is currently External Examiner for:

Mechanical Engineering / with Financial Management / with International Study / with Materials Engineering

Prof Mark Lowenberg (Professor of Flight Dynamics), from the Department of Aerospace Engineering, University of Bristol is currently External Examiner for:

Mechanical Engineering with Aeronautics
Aero-Mechanical Engineering

Students must not contact External Examiners with queries against an academic decision. You should contact the Department for feedback or submit an appeal at the appropriate time as per the Personal Circumstances and University's Academic Appeals Procedure.

Use of calculators

It is recommended that students have a basic scientific calculator for use in examinations as, although calculators may normally be taken into an exam venue, they must not be used to store text nor formulae nor be capable of communication. Invigilators may require calculators to be reset. Candidates are not permitted to share the use of calculators.

Use of dictionaries

Regulations state that students whose native language is not English are permitted to use paper-based English/native language dictionaries in University examinations. These dictionaries will be subject to scrutiny by the Invigilator in charge of each examination. Electronic dictionaries are not permitted in University examinations. Regulations state that, unless instructions have been issued to the contrary, dictionaries shall not be used in language examinations.

Use of Electronic Devices

Electronic devices are not permitted during examinations (unless with prior written permission of the Department/School). Electronic devices include, but are not limited to: mobile phones, music players, tablets and smart watches. Candidates are not permitted to bring earphones into the examination room. **DEVICES CANNOT BE USED AS CALCULATORS DURING EXAMS.**

Pass mark

Normally the pass mark for each class is 40% unless otherwise notified (NB: level 5 subjects require a pass mark of 50%). However there are a number of reasons why you should set your sights higher than this, not least being the fact that your marks will appear on your Academic Transcript, copies of which are often sought by prospective employers. In addition, where the classes contribute to the grading of your final degree classification, it is important for you to secure the highest possible marks. Students in their first, second and third years, and fourth year (MEng only) who perform well, will be rewarded by the award of a Dean's Certificate for meritorious performance. In addition to this, a number of other prizes are awarded each year to top students.

Requests to sit Examinations off-campus

Your attention is drawn especially to the following:

All students are expected to attend for examination at the University of Strathclyde on the dates and times scheduled. Only EXCEPTIONALLY will permission be given for students to sit examinations out-with the University.

Such an exception may be:

- when a student participating in an exchange programme has to take a University of Strathclyde examination while at the exchange institution

Permission will NOT be granted by the Department in the following cases:

- if a student wishes to leave the University prior to the end of the examination period
- where a student has a resit examination (all students must attend resits in Glasgow in person)

NOTE – arrangements to travel overseas must not be made until you know that you have passed all classes for the current academic year.

Students who choose to make travel arrangements (such as purchasing non-flexible/changeable airline tickets) prior to receiving official results at the end of the academic year, must return to the University of Strathclyde in Glasgow during the resit diet to carry out examinations on campus for any failed classes.

Where necessary and where provisionally agreed in principal by the Exam Co-ordinator, requests to take an examination at a BONA FIDE institution other than this University (normally one of our overseas exchange institutions or a British Council Office) should be formally made in writing via the appropriate Year Adviser.

This request must be made no later than SIX WEEKS prior to the start of the examination diet. Once permission, in principle, has been granted you must thereafter arrange for written communication to be sent by an authorised person at the proposed examination site confirming that the institute is prepared to act for the University of Strathclyde in this matter and giving a contact name, telephone number, e-mail address and full postal address. **NB: Post box addresses are not suitable as exam papers will be transported by courier.** This written communication must reach your Year Adviser no later than FOUR WEEKS prior to the start of the examination diet. Your request and the statement from the “authorised person” mentioned above are then sent by the departmental Examination Co-ordinator to the Director of Professional Services from whom formal approval must be obtained. **Examination papers cannot be sent abroad unless the above procedure has been followed.**

For all MAE classes with codes beginning “16” and “ME” the MAE Examination Co-ordinator is:

Donna Fairley, donna.fairley@strath.ac.uk

Names of Examination Co-ordinators for other Departments may be obtained from the ‘Students’ section on the Disability Service webpage <http://www.strath.ac.uk/disabilityservice/> or from the relevant Department.

You should also note that you will be liable for all expenses incurred and fees charged (if any) by the overseas institution.



Section 2

Educational Aims & Course Regulations

The educational aims communicated to students via course literature indicate that the course is designed to graduate qualified professional engineers and that a student will:

Develop the capacity to learn independently and to master new ideas and technologies.

Increase skills in communicating and working effectively with others – individually and in teams.

Develop a sound working knowledge of the fundamentals of systems and processes, which are generally recognised to be in the domain of mechanical engineering and related subjects.

Develop the ability to understand, model and predict the behaviour of engineering artefacts through the application of mathematical, scientific and technological principles.

Be provided with extensive practice in creating new engineering solutions, adapting old ones, and in using acquired knowledge in materials, energy systems, manufacture and computer-aided design techniques.

Practice formulating, monitoring and adjusting project plans in the light of changing circumstances.

Develop an understanding of financial, organisational and strategic aspects of engineering businesses.

Have as many opportunities as practicable to follow special interests and activities during the programme.

Have the opportunity to develop foreign language capabilities.

Grow to understand his/her place as a professional engineer within engineering and the wider community.

Meet the Educational Base requirements for eventual registration as a Chartered Engineer.

11.47 Department of Mechanical & Aerospace Engineering**Mechanical Engineering****BEng with Honours in Aero-Mechanical Engineering****BEng with Honours in Mechanical Engineering****BEng with Honours in Mechanical Engineering with International Study****BEng in Mechanical Engineering****Diploma of Higher Education in Mechanical Engineering****Certificate of Higher Education in Mechanical Engineering**

Course Regulations [These regulations are to be read in conjunction with Regulation 11.1] **UP-TO-DATE REGULATIONS FOR 2016/17 ARE YET TO BE OFFICIALLY RATIFIED BY THE UNIVERSITY; BELOW DETAILS ARE A CURRENT GUIDE ONLY.**

Status of the Courses

- 11.47.1 All students are normally admitted in the first instance as potential Honours students. Transfer between these courses is possible prior to the third year of study. Transfer to the MEng degree courses in Mechanical Engineering, Mechanical Engineering with International Study and Aero-Mechanical Engineering is possible prior to the fourth year of study subject to satisfying the appropriate progress requirements.

Mode of Study

- 11.47.2 The courses are available by full-time study only.

Place of Study

- 11.47.3 The BEng course in Mechanical Engineering with International Study requires study at an approved institution abroad. Such study will normally extend over a minimum period of 30 weeks.

Curriculum**First Year**

- 11.47.4 All students shall undertake classes amounting to 120 credits as follows:

Compulsory Classes	Level	Credits
16 132 Engineering Mechanics 1	1	20
EE 108 Electrical Circuits	1	10
ME 101 Heat and Flow 1	1	10
ME 105 Mechanical Engineering Design	1	20
ME 107 Experimental and Laboratory Skills	1	10
ME 108 Engineering Analysis and Numerical Methods	1	10
MM 117 Mathematics 1M	1	20
Elective Class(es)		20

Second Year

- 11.47.5 All students shall undertake classes amounting to 120 credits as follows:

Compulsory Classes	Level	Credits
16 232 Engineering Mechanics 2	2	20
16 288 Professional Studies	2	10
19 222 Electrical Machines and Control	2	10
ME 203 Heat and Flow 2	2	20
ME 209 Mathematical Modelling and Analysis	2	20
ME 212 Materials Engineering and Design	2	10
ME 214 Mechanical Engineering Design 2	2	10

together with classes appropriate to the chosen course:

Aero-Mechanical Engineering

16 231 Flight and Spaceflight 1	2	10
ME 201 Aero Design and Flight Test	2	10

Mechanical Engineering
Mechanical Engineering with International Study
 Elective Class(es)

20

Third Year

11.47.6 All students shall undertake classes amounting to 120 credits as follows:

Compulsory Classes		Level	Credits
16 327	Structural Mechanics	3	10
16 361	Dynamics and Control	3	20
16 363	Engineering Analysis 3	3	20
ME 301	Heat and Flow 3	3	20
ME 415	Strategic Analysis of Engineering Business Case Studies	4	10
ME 416	Engineering Ethics	4	10

together with classes appropriate to the chosen course:

Aero-Mechanical Engineering

16 351	Flight and Spaceflight 2	3	10
16 309	Aero-Design 2	3	20

Mechanical Engineering**Mechanical Engineering with International Study**

ME 312	Mechanical Design 3A	3	10
ME 313	Mechanical Design 3B	3	20

Mechanical Engineering with International Study

All students are normally required to undertake study abroad at an approved institution and shall follow an approved curriculum reflecting that undertaken by students taking the Mechanical Engineering course. Such study will normally extend over a minimum period of 30 weeks.

Fourth Year

11.47.7 All students shall undertake classes amounting to 120 credits as follows:

Compulsory Classes		Level	Credits
16 402	Case Studies in Engineering	4	10
16 429	Computer Aided Engineering Design	4	20
ME 403	Engineering Materials Selection	4	10
ME 405	Heat and Flow 4	4	10
ME 414	Advanced Mechanics and Dynamics	4	20

together with classes appropriate to the chosen course:

Aero-Mechanical Engineering

ME 420	Individual Project - Aerospace	4	40
ME 425	Aerospace Propulsion	4	10

ME420 Individual Project - Aerospace can be used to contribute towards a Vertically Integrated Project (VIP).

Mechanical Engineering**Mechanical Engineering with International Study**

ME 404	Energy Systems Modelling	4	10
ME 409	Individual Project	4	40

ME409 Individual Project can be used to contribute towards a Vertically Integrated Project (VIP).

Progress

- 11.47.8 Progress to a period of study abroad is dependent on passing all compulsory classes. A student registered for the Mechanical Engineering with International Study course who does not meet this requirement at this stage will be required to transfer to another course.
- 11.47.9 In order to progress to the second year of the course, a student must have accumulated at least 100 credits from the course curriculum.
- 11.47.10 In order to progress to the third year of the course, a student must have accumulated at least 220 credits from the course curriculum.
- 11.47.11 In order to progress to the fourth year of the chosen course, a student must have accumulated at least 360 credits from the course curriculum.

11.47.12 Final Assessment and Honours Classification

The final Honours classification will normally be based on the first assessed attempt at compulsory and specified optional classes taken in the second, third and fourth years.

Award

- 11.47.13 **BEng with Honours:** In order to qualify for the award of the degree of BEng with Honours in the chosen course, a candidate must have accumulated no fewer than 480 credits from the course curriculum
- 11.47.14 In order to qualify for the award of BEng with Honours in Mechanical Engineering with International Study, in addition to satisfying the provisions of Regulation 11.47.13, a student must normally have spent no fewer than 30 weeks of approved study abroad.
- 11.47.15 **BEng:** In order to qualify for the award of the degree of BEng in Mechanical Engineering, a candidate must have accumulated no fewer than 360 credits from the course curriculum.
- 11.47.16 **Diploma of Higher Education:** In order to qualify for the award of a Diploma of Higher Education in Mechanical Engineering a candidate must have accumulated no fewer than 240 credits from the course curriculum.
- 11.47.17 **Certificate of Higher Education:** In order to qualify for the award of a Certificate of Higher Education in Mechanical Engineering, a candidate must have accumulated no fewer than 120 credits from the course curriculum.

Transfer

- 11.47.18 A candidate who fails to satisfy the progress or award requirements for the BEng in Mechanical Engineering or BEng in Aero-Mechanical Engineering may be transferred to the degree of BEng in Engineering Studies.

12.47 Department of Mechanical Engineering**Mechanical Engineering****MEng in Aero-Mechanical Engineering****MEng in Mechanical Engineering****MEng in Mechanical Engineering with Aeronautics****MEng in Mechanical Engineering with Financial Management****MEng in Mechanical Engineering with Materials Engineering****MEng in Mechanical Engineering with International Study**

Course Regulations [These regulations are to be read in conjunction with Regulation 12.1] **UP-TO-DATE REGULATIONS FOR 2016/17 ARE YET TO BE OFFICIALLY RATIFIED BY THE UNIVERSITY; BELOW DETAILS ARE A CURRENT GUIDE ONLY.**

Status of the Courses

- 12.47.1 The courses are at Integrated Masters level. Transfer to the BEng degree in Mechanical Engineering or to the BEng with Honours degrees in Aero-Mechanical Engineering, Mechanical Engineering or Mechanical Engineering with International Study is possible at any time subject to satisfying the appropriate progress requirements. Transfer between the MEng degrees may be possible at any time prior to the fourth year of study.

Mode of Study

- 12.47.2 The courses are available by full-time study only.

Place of Study

- 12.47.3 The MEng in Mechanical Engineering with International Study requires study at an approved institution abroad. Such study will normally extend over a minimum period of 30 weeks.

Curriculum**First Year**

- 12.47.4 All students shall undertake classes amounting to 120 credits as follows:

Compulsory Classes		Level	Credits
16 132	Engineering Mechanics 1	1	20
ME108	Engineering Analysis and Numerical Methods	1	10
EE 108	Electrical Circuits	1	10
ME 101	Heat and Flow 1	1	10
ME 105	Mechanical Engineering Design	1	20
ME 107	Experimental and Laboratory Skills	1	10
MM 117	Mathematics 1M	1	20

Elective Class(es) 20

Second Year

- 12.47.5 All students shall undertake classes amounting to 120 credits as follows:

Compulsory Classes		Level	Credits
16 232	Engineering Mechanics 2	2	20
16 288	Professional Studies	2	10
19 222	Electrical Machines and Control	2	10
ME 203	Heat and Flow 2	2	20
ME 209	Mathematical Modelling and Analysis	2	20
ME 212	Materials Engineering and Design	2	10
ME 214	Mechanical Engineering Design 2	2	10

together with classes appropriate to the chosen course:

Mechanical Engineering		
Mechanical Engineering with International Study		
Mechanical Engineering with Materials Engineering		
Elective Class(es)		20
Aero-Mechanical Engineering		
16 231 Flight and Spaceflight 1	2	10
ME 201 Aero Design and Flight Test	2	10
Mechanical Engineering with Aeronautics		
16 231 Flight and Spaceflight 1	2	10
16259 Aero Design 1	2	10
Mechanical Engineering with Financial Management		
AG 151 Introduction to Finance and Accounting	1	20

Third Year

12.47.6 All students shall undertake classes amounting to 120 credits as follows:

Compulsory Classes	Level	Credits
16 327 Structural Mechanics	3	10
16 361 Dynamics and Control	3	20
16 363 Engineering Analysis 3	3	20
ME 301 Heat and Flow 3	3	20
ME 415 Strategic Analysis of Engineering Business Case Studies	4	10
ME 416 Engineering Ethics	4	10

together with classes appropriate to the chosen course:

Aero-Mechanical Engineering		
Mechanical Engineering with Aeronautics		
16 351 Flight and Spaceflight 2	3	10
16 309 Aero- Design 2	3	20
Mechanical Engineering		
Mechanical Engineering with Financial Management		
Mechanical Engineering with Materials Engineering		
Mechanical Engineering with International Study		
ME 312 Mechanical Design 3A	3	10
ME 313 Mechanical Design 3B	3	20

Mechanical Engineering with International Study

Students who elect to undertake study abroad in their third year must do so at an approved institution and shall follow an approved curriculum reflecting that undertaken by students taking the Mechanical Engineering course. Such study will normally extend over a minimum period of 30 weeks.

Fourth Year

12.47.7 All students will undertake classes amounting to 120 credits as follows:

Compulsory Classes

	Level	Credits
16 402 Case Studies in Engineering	4	10
16 429 Computer Aided Engineering Design	4	20
ME 403 Engineering Materials Selection	4	10
ME 405 Heat and Flow 4	4	10
ME 414 Advanced Mechanics and Dynamics	4	20

together with classes appropriate to the chosen course:

Aero-Mechanical Engineering

ME 420 Individual Project - Aerospace	4	40
ME 425 Aerospace Propulsion	4	10

ME420 Individual Project - Aerospace can be used to contribute towards a Vertically Integrated Project.

Mechanical Engineering with Aeronautics

ME 409 Individual Project	4	40
<u>Either</u> ME 404 Energy Systems Modelling	4	10
<u>Or</u> ME 425 Aerospace Propulsion	4	10

ME409 Individual Project can be used to contribute towards a Vertically Integrated Project.

Mechanical Engineering***Mechanical Engineering with Financial Management******Mechanical Engineering with Materials Engineering******Mechanical Engineering with International Study***

ME 404 Energy Systems Modelling	4	10
ME 409 Individual Project	4	40

ME409 Individual Project can be used to contribute towards a Vertically Integrated Project.

Fifth Year

12.47.8 All students, with the exception of those who elect to spend fifth year of studies abroad, shall undertake 120 level 5 credits as follows:

Aero-Mechanical Engineering**Compulsory Classes**

ME 525 MEng Group Project - Aerospace	5	40
16 599 Aerodynamic Propulsion Systems	5	10

together with optional classes chosen from Regulation 12.47.9

Mechanical Engineering***Mechanical Engineering with Aeronautics******Mechanical Engineering with International Study*****Compulsory Classes**

ME 519 Group Project	5	40
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together with optional classes chosen from Regulation 12.47.9

Mechanical Engineering with Financial Management**Compulsory Class**

ME 519 Group Project	5	40
ME 515 Finance for Mechanical Engineers	5	60

together with optional classes chosen from Regulation 12.47.9

Mechanical Engineering with Materials Engineering

ME 519	Group Project	5	40
16 565	Engineering Composites	5	10
ME 523	Polymer and Polymer Composites	5	10

together with optional classes chosen from Regulation 12.47.9

ME519 Group Project or ME525 MEng Group Project - Aerospace can be used to contribute towards a Vertically Integrated Project.

Students who elect to undertake their period of study abroad in fifth year must do so at an institution acceptable to the Head of Department and shall be registered for ME524 – MEng Group Project Abroad.

12.47.9 Optional Classes

16565	Engineering Composites	5	10
16587	Pressurised Systems	5	10
16599	Aerodynamic Propulsion Systems	5	10
ME505	Machine Dynamics	5	10
ME507	Machinery Diagnosis and Condition Monitoring	5	10
ME511	Mathematical Modelling in Engineering Science	5	10
ME512	Spaceflight Mechanics	5	10
ME514	Advanced Topics in Fluid Systems Engineering	5	10
ME517	Spaceflight Systems	5	10
ME520	Advanced Research Project A	5	10
ME521	Advanced Research Project B	5	20
ME523	Polymer and Polymer Composites	5	10
ME526	Engineering Plasticity	5	10
ME527	Introduction to Engineering Optimisation	5	10
ME528	Control Systems Design	5	10
ME529	Aerodynamics in C	5	10

Exceptionally, such other level 5 classes totalling no more than 20 credits as approved by the Course Director.

12.47.10 Class Combinations

ME 515 Finance for Mechanical Engineers	60	Finance classes at an appropriate level as may be approved by the Adviser of Study
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Progress

- 12.47.11 Progress to a period of study abroad is dependent on passing all compulsory classes. A student registered for the Mechanical Engineering with International Study course who does not meet this requirement at this stage will be required to transfer to another course.
- 12.47.12 In order to progress to the second year of the course, a student must have accumulated at least 100 credits from the course curriculum.
- 12.47.13 In order to progress to the third year of the course, a student must have accumulated at least 220 credits from the chosen course curriculum.
- 12.47.14 In order to progress to the fourth year of the course, a student must have accumulated at least 360 credits from the chosen course curriculum.
- 12.47.15 In order to progress to the fifth year of the course, a student must have accumulated at least 480 credits from the chosen course curriculum.

Final Assessment and Classification

- 12.47.16 The final classification for the degree of MEng in the chosen course will normally be based on the first assessed attempt at compulsory and specified optional classes in the second, third, fourth and fifth years.

Award

- 12.47.17 **MEng:** In order to qualify for the award of the degree of MEng in Aero-Mechanical Engineering or the MEng in Mechanical Engineering or the MEng in Mechanical Engineering with International Study, or the MEng in Mechanical Engineering in the chosen specialisation, a candidate must have accumulated no fewer than 600 credits from the appropriate course curriculum.

In addition, candidates for the degree of Mechanical Engineering with International Study must satisfy the requirements of 12.47.19.

- 12.47.19 A candidate for the award of MEng in Mechanical Engineering with International Study in addition must normally have undertaken no fewer than 30 weeks of approved study abroad.

Transfer

- 12.47.20 A candidate who fails to satisfy the progress or award requirements for the degree of MEng may be transferred to the degree of BEng in the chosen course where available.

Section 3

Class Details

Compulsory Classes

Module Description Forms for all classes which follow can be found on the Departmental website at <http://www.strath.ac.uk/engineering/mechanicalaerospaceengineering/student-information/>. These contain comprehensive and up-to-date information on all classes.

Module Assessments/Syllabuses: please refer to each specific MDF on the above webpage.

NB: Past exams papers (hard and electronic copies) can be found via the University Library.

(R) = Registrar in charge of class.

First Year

Year Adviser: Prof J T Boyle (all class enquiries to be directed to Registrars (R))

16132 Engineering Mechanics 1 - 20 credits (ECTS 10)

Semester 1 and 2: Prof J T Boyle (R), Dr R Hamilton

ME101 Heat and Flow 1 - 10 credits (ECTS 5)

Semester 1 and 2: Dr W Dempster (R), Dr M Lappa

ME105 Mechanical Engineering Design - 20 credits (ECTS 10)

Semester 1 and 2: Dr A McLaren (R), Dr T Comlecki

ME107 Experimental and Laboratory Skills - 10 credits (ECTS 5)

Semester 1 and 2: Dr A McLaren (R), Dr B Keating, Dr D Garcia Cava

ME108 Engineering Analysis and Numerical Methods – 10 credits (ECTS 5)

Semester 1 and 2: Dr M Lappa (R), Dr H Cheng, Dr A Riccardi

EE108 Electrical Circuits - 10 credits (ECTS 5)

Semester 1: Dr P Niewczas (R), Dr R O'Leary

MM117 Mathematics 1M - 20 credits (ECTS 10)

Semester 1 and 2: Dr E Dombi (R), Dr A Sonnet, Dr V D Maini, Dr Y Eom

Second Year

Year Adviser: Prof D Mackenzie (all class enquiries to be directed to Registrars (R))

16231 Flight and Spaceflight - 10 credits (ECTS 5)

Semester 1 and 2: Dr M Stickland (R), Dr M Fossati

16232 Engineering Mechanics 2 - 20 credits (ECTS 10)

Semester 1 and 2: Dr R Hamilton (R), Dr L Yang

16259 Aero-Design 1 - 10 credits (ECTS 5)

Semester 2: Dr M Macdonald (R) , Dr M Afsar

16288 Professional Studies - 10 credits (ECTS 5)

Semester 2: Prof J Boyle (R)

ME201 Aero-Design and Flight Test - 10 credits (ECTS 5)

Semester 2: Dr M Macdonald (R), Dr M Stickland, Dr M Afsar

ME203 Heat and Flow 2 - 20 credits (ECTS 10)

Semester 1 and 2: Dr M Oliveira (R), Dr S Haeri, Prof A Heyes

ME209 Mathematical Modelling and Analysis - 20 credits (ECTS 10)

Semester 1 and 2: Dr H Chen (R), Dr E Minisci

ME212 Materials Engineering and Design - 10 credits (ECTS 5)

Semester 1: Dr A McLaren (R), Dr D Garcia Cava

ME214 Mechanical Engineering Design 2 – 10 credits (ECTS 5)

Semester 1: Dr T Comlekci (R), Prof J Thomason

19222 Electrical Machines and Control - 10 credits (ECTS 5)

Semester 2: Dr A Roscoe (R), Dr L Xu

AG151 Introduction to Finance and Accounting – 20 credits

Semester 1 and 2: Prof A Marshall (R), Dr D Andriosopoulos

Third Year

Year Adviser: Mr C Johnstone (all class enquiries to be directed to Registrars (R))

16309 Aero-Design 2 - 20 credits (ECTS 10)

Semester 2: Dr M Stickland (R)

16327 Structural Mechanics - 10 credits (ECTS 5)

Semester 1: Dr M Wheel (R)

16351 Flight and Spaceflight 2 - 10 credits (ECTS 5)

Semester 1: Dr M Stickland (R)

16361 Dynamics & Control – 20 credits (ECTS 10)

Semester 1 and 2: Prof M Cartmell (R), Prof M Vasile

*NB: Alternative codes for certain exchange students only: ME305 sem1, 16318 sem2 (10 credits)

16363 Engineering Analysis III - 20 credits (ECTS 10)

Semester 1 and 2: Prof D Mackenzie (R), Dr B Keating, Prof Y Zhang, Dr T Scanlon

*NB: Alternative codes for certain exchange students only: 16366 sem1, 16367 sem2 (10 credits)

ME301 Heat and Flow 3 - 20 credits (ECTS 10)

Semester 1 and 2: Dr T Scanlon (R), Dr L Wu

*NB: Alternative codes for certain exchange students only: ME303 sem1, ME302 sem2 (10 credits)

ME312 Mechanical Engineering Design 3A - 10 credits (ECTS 5)

Semester 1: Prof D Nash (R), Mr C Johnstone

ME313 Mechanical Design 3B - 20 credits (ECTS 10)

Semester 2: Prof D Nash (R), Mr C Johnstone

ME415 Strategic Analysis of Engineering Business Case Studies - 10 credits (ECTS 5)

Semester 1: Prof D Nash (R)

ME416 Engineering Ethics - 10 credits (ECTS 5)

Semester 2: Prof J T Boyle (R)

Fourth Year

Year Adviser: Dr M A Wheel (all class enquiries to be directed to Registrars (R))

16402 (*16460, 16464) Case Studies in Engineering - 10 credits (ECTS 5)

Semester 1 and 2: Prof M Stack (R), Dr G Rasool

*NB: Alternative codes for incoming exchange students only: 16460 sem1, 16464 sem2 (5 credits)

16429 Computer Aided Engineering Design - 20 credits (ECTS 10)

Semester 1 and 2: Prof Y Zhang (R), Dr T Comlekci, Dr H Chen, Dr B Keating

ME403 (*ME406) Engineering Materials Selection - 10 credits (ECTS 5)

Semester 1 and 2: Dr A Galloway (R), Dr A Toumpis

*NB: Alternative code for incoming exchange students only: ME406 sem1, ME418 sem2 (5 credits)

ME404 Energy Systems Modelling - 10 credits (ECTS 5)

Semester 2: Professor J Clarke (R)

ME405 Heat and Flow 4 - 10 credits (ECTS 5)

Semester 1: Dr T Scanlon (R)

ME414 Advanced Mechanics & Dynamics - 20 credits (ECTS 10)

Semester 1 and 2: Dr M Wheel (R), Dr R Hamilton, Prof D Mackenzie, Prof D Nash

ME425 Aerospace Propulsion - 10 credits (ECTS 20)

Semester 2: Prof A Heyes

ME409 Individual Project Project - 40 credits (ECTS 20) 400hrs

ME420 Individual Project - Aerospace – 40 credits (ECTS 20) 400hrs

ME421 Graduate Diploma Individual Project – 40 credits (ECTS 20) 400hrs

Semester 1 and 2: Prof J T Boyle (R and Project Coordinator) and All Project Supervisors

Fifth Year

Year Adviser: Dr M Oliveira (all class enquiries to be directed to Registrars (R))

NOTE: THE PASS MARK FOR LEVEL 5 CLASSES IS 50%

16565 Engineering Composites - 10 credits (ECTS 5)

Semester 2: Prof J Thomason, (R), Prof M Stack

16599 Aerodynamic Propulsion Systems - 10 credits (ECTS 5)

Semester 2: Prof A Heyes (R)

ME515 Finance for Mechanical Engineers - 60 credits (ECTS 30)

Semester 1 and 2: Prof J Boyle (R)

ME519 MEng Group Project – 40 credits

ME525 MEng Group Project–Aerospace – 40 credits

Semester 1 and 2: Dr A McLaren (R), and Supervisors

Optionals (also 16565 and 16599 above)

16587 Pressurised Systems - 10 credits (ECTS 5)

Semester 1: Prof D Nash (R)

ME505 Machine Dynamics - 10 credits (ECTS 5)

Semester 1: TBC (R) ****MODULE NOT ON OFFER 2016/17****

ME507 Machinery Diagnosis and Condition Monitoring - 10 credits (ECTS 5)

Semester 1 and 2: Dr I Trendafilova (R), Dr G West, Dr V Caterson

ME511 Mathematical Modelling in Engineering Science - 10 credits (ECTS 5)

Semester 2: TBC (R) ****MODULE NOT ON OFFER 2016/17****

ME512 Spaceflight Mechanics - 10 credits (ECTS 5)

Semester 1: Dr M Vasile (R)

ME514 Advanced Topics in Fluid Systems Engineering - 10 credits (ECTS 5)

Semester 2: Dr Y Zhang (R), Dr T Scanlon, Dr M Oliveira, Dr L Wu, Dr M Lappa, Dr S Haeri

ME517 Spaceflight Systems – 10 credits

Semester 2: Dr M Macdonald (R), Visiting Lecturers

ME520 Advanced Research Project A – 10 credits

Semester 1: Dr A McLaren (R) and Supervisors

ME521 Advanced Research Project B – 20 credits

Semester 2: Dr A McLaren (R) and Supervisors

ME523 Polymer and Polymer Composites – 10 credits (ECTS 5)

Semester 2: Dr L Yang (R)

ME526 Engineering Plasticity – 10 credits

Semester 1: Prof D Mackenzie (R)

ME527 Introduction to Engineering Optimisation – 10 credits

Semester 2: Dr E Minisci (R), Prof M Vasile

ME528 Control Systems Design – 10 credits (ECTS 5)

Semester 2: Dr C Maddock (R)

ME529 Aerodynamics in C – 10 credits (ECTS 5)

Semester 2: Dr M Stickland (R)

Appendix 1

Departmental Occupational Health and Safety Arrangements

Emergency telephone numbers (internal) - Extension 2222 or 3333

Emergency telephone number (external) 9/999 Fire/Police/Ambulance

1. Safety Organisation

Health and safety within the Department is organised in accordance with the University Safety Code (Section 6.6 of the University Calendar) which should be studied by all members of staff. All members of staff will be issued with a copy of these Regulations and are required to sign a declaration stating that the Regulations have been read and understood. Supervisory staff should ensure that the attention of students is drawn to the provisions of the Safety Code and Departmental Safety Regulations.

The Head of the Department has ultimate responsibility for all health and safety matters.

Health and safety management is undertaken by the Departmental Safety Convener.

An Area Safety Committee has been formed to monitor health and safety issues within specific areas. The identities of current post-holders and their areas of responsibility can be obtained from Central Services or from the Departmental Safety Convener.

General information on any health and safety matter should be directed to the Departmental Safety Convener in the first instance.

The University's Safety Services Unit can be contacted on Ext 2726.

2. Departmental Safety Committee

A Departmental Safety Committee has been appointed consisting of at least three persons representative of the main groups of staff working in each area and include, where appropriate, at least one student. The Departmental Safety Convener convenes the meetings of the Departmental Safety Committee and acts on its behalf as necessary.

3. Fire

In the event of a General Fire Alarm the procedure is set out in the Fire Regulations posted at every floor of the James Weir Building and any other building you may occupy. Read these carefully and check from time to time for any changes which may be made.

- Fire drills will be held at least once per semester.
- Know the meaning of the audible fire alarms.
- Know every escape route in the building.
- Exit by a different route at each drill.
- Note locations of fire extinguishers - all are clearly marked.

In the event of a fire being discovered:-

- Leave the room, close the door and raise the alarm by activating the nearest "break-glass" fire alarm call point and informing the security wardens (Ext 2222 or 3333).

- If it is safe to do so, use an appropriate fire extinguisher to attack the fire. Do not use water where electrical equipment or flammable liquids are involved.
- In the case of laboratory fires, if it is safe to do so, switch off all electrical and fuel supplies to the equipment involved or, if necessary, to the entire laboratory.
- Do not store combustible materials on or near electric heaters.
- Do not accumulate waste material.
- Keep litter bins covered.
- Keep fire exits clear of obstructions

4. Accident or Illness

Emergency Telephone Numbers - Extension 2222 or 3333

- If possible give immediate assistance to the patient. General First-Aid Guidance notes are contained in all First-Aid boxes. A First Aid box may be found in all of the Departmental Laboratories.
- Get help of colleagues.
- Telephone 2222 or 3333 giving own name and department, exact location (building, floor, room number) and nature of incident.
- Say if a doctor is required.
- Do not move the patient from reported position (unless obviously necessary to avoid further injury) until the arrival of the ambulance services.
- The patient should be accompanied to the hospital by a colleague.

5. Reporting of Accidents and Dangerous Occurrences

All accidents and dangerous occurrences, however apparently trivial, should be reported to the member of staff in charge or to the technician in charge of the laboratory. **The Departmental Safety Convener** should also be informed.

An official Accident or Occurrence Report Form S.1 should be completed for all accidents and dangerous occurrences and sent to the University Safety Officer via the **The Departmental Safety Convener**. Should an incident result in hospital attendance, the Safety Office should be informed by phone as soon as possible.

6. COSHH

Under the Control of Substances Hazardous to Health Regulations 1988 (COSHH), it is incumbent upon anyone involved in the use of hazardous materials to ensure that a safe working practice is agreed upon. No work is permitted until a **RISK ASSESSMENT FORM (S20/S21)** has been completed. Copies of each assessment must be lodged with the Safety Convener.

All staff and relevant students should be acquainted with the Regulations.

Copies of the approved Guidance handbook on COSHH may be obtained from the Safety Convener or the University Safety Office.

Failure to comply with the Regulations may result in that area of activity being shut down BY LAW.

7. Hazardous Operations

Work should not proceed unless a Risk Assessment has been issued and signed.

Suitable protective clothing must be worn for all potentially dangerous operations (e.g. grinding/welding) supplies of which are available from the technician in charge of the laboratory.

All areas in which special hazards exist (e.g. lasers) are clearly marked and entry to these regions is restricted to those personnel having permission to work in them. Refer to the Protection of Eyes Regulations 1974.

All hazardous materials and glassware should only be transported or carried in properly designed safety containers. Winchestersters should be carried only in proper holders, not in the hand. Passenger lifts should not be used unless special precautions are taken.

8. Permits to Work

All persons, other than trained workshop staff, who wish to use machine tools, hand held tools or welding equipment, etc must have a Permit to Work signed by the Head of Department or his appointed Deputy and an appropriate Academic Supervisor. Permits will only be granted to persons who can show evidence of satisfactory training and relevant experience. Permit holders must liaise with the Laboratory Superintendent before using any equipment. Permit application forms can be obtained from the Departmental Safety Convener.

9. General Laboratory/Workshop Procedure

- Protective clothing and safety glasses must be worn at all times.
- Coat racks or lockers are provided and should be used for outdoor clothing (coats, scarves, etc.).
- Food and drink is not permitted in laboratories or workshops.
- Always use machine guards where provided.
- Clean tools and machines after use and deposit all scrap material in the bins provided.
- Keep litter bins covered.
- Observe and obey No Smoking signs.
- Observe and obey all warning signs.
- Horseplay is forbidden.
- When operating equipment in the laboratories, at least two people should be present. One of these should be a technician or a member of the academic staff. Where working alone is essential, the completion of a Risk Assessment must be performed and endorsed by the Laboratory Superintendent or Academic Supervisor prior to the commencement of such work.
- Avoid loose clothing, long hair and badly fitting footwear.
- Keep all chemicals in suitable storage (see under COSHH).
- Switch off all gas cylinders, water, gas and other taps when not in use.
- Keep labs and workshops tidy.

- Keep floors clean and free of oil and grease deposits.
- Do not obstruct passages, doorways or other thoroughfares.
- Keep clear of overhead lifting-gear.
- Lifting tackle should only be used by trained personnel under the overall supervision of the technician in charge and in accordance with appropriate regulations. Replace all guard rails which may have been removed to facilitate the movement of equipment.
- Do not overload electrical power points.
- Trip hazards, such as trailing cables must not run across working areas.

9.1 Office Areas

- Office areas should be kept clean and tidy and free of trailing electrical cables.
- Cables should be inspected regularly and replaced if the insulation shows signs of wear.
- Materials should not be stored on top of filing cabinets or cupboards particularly near eye level.
- Filing cabinets should be filled from the bottom to ensure stability and drawers kept closed.
- Solvents should only be used in well ventilated areas and kept clear of heat sources.

10. Access to Buildings outwith Normal Hours

See Access to University Premises (Appendix 2) and page 14 of this Handbook.

11. Supervision of Postgraduate and Project Students

Supervisors should establish a mode of working with their students such that the supervisor is aware of and agrees to, each element of work, that safe working practices are agreed and where appropriate set down on paper and that regular, active, supervision is established.

12. Visitors to Laboratories

Visitors to the laboratories who are not accompanied by a member of staff should report to the relevant Laboratory Superintendent.

Maintenance staff should report to the relevant Laboratory Superintendent before commencing work in any laboratory area.

Children under the age of 14 are not normally permitted to enter laboratories or workshops. (See Appendix 2 of this Handbook).

13. Electricity at Work Regulations 1989

All offices, storerooms, workshops and laboratories, of whatever kind, within the Department must comply with these Regulations.

It should be noted that the University's Estates Management Department is responsible for all electrical services in the University, e.g. isolators, sockets and other such fixed equipment and no one may break into the electrical system for any reason without the authorisation of the University Electrical Engineer. Persons involved in the use of, and/or responsible for the use of electrical equipment, must read the Regulations and the University's own handbook entitled "Local Rules for Electrical Safety" (November 1991), a copy of which may be obtained from the Departmental Safety Convener. Work on 'live' equipment is prohibited unless in the most

exceptional circumstances; before any such work is undertaken permission in writing must be granted by the Departmental Safety Convener.

14. General Electrical Safety

Open-bar electric fires and non-automatic kettles are not allowed in the University.

Multi-way distribution boards with 13 amp shuttered outlets may be used from a socket provided the total load does not exceed 13 amps and they are designed to BS1363. Adaptors are not permitted.

Plugs must be fitted by, and new equipment inspected by, a competent person, before being taken into service, normally by arrangement with the relevant Laboratory Superintendent. A record of the equipment must be kept (see 15 below). The Departmental Safety Convener may approve members of staff bringing in their own personal electrical equipment (except those banned items shown above), however, such items must also be included in the Departmental inventory of electrical equipment and appropriately inspected and tested (see 15 below).

All staff have individual responsibility to report obviously faulty equipment, e.g. broken plug tops, damaged cables, etc. to their supervisor or directly to the relevant Laboratory Superintendent. Equipment thought to be defective should not be used and must be reported immediately to the relevant Laboratory Superintendent. Such equipment should be removed from service until compliance with Section 15 is established. Users of equipment should regularly inspect for damage to casings, cables and plugs etc. and for loose screws.

Where specific hazards exist in laboratory/workshop areas they will be clearly marked at the direction of the relevant Laboratory Superintendent.

All persons wishing to use new or existing equipment in laboratory areas must liaise with the relevant Laboratory Superintendent before commencing work.

15. Inspection and Testing of Electrical Apparatus

All electrical apparatus is required to be inspected and tested at certain intervals. Portable electrical equipment should not be used unless it possesses an approved PAT label.

All fixed installations are the responsibility of the University Electrical Engineer.

All other equipment which can be plugged into a socket, including extension cables, etc. (and can also include battery operated equipment) is the responsibility of the Head of Department.

The Regulations require records to be kept of the maintenance, inspection and testing of all equipment in some detail for the duration of its working life. These records will be maintained centrally by the Departmental Safety Convener. Advice should be sought from the relevant Laboratory Superintendent prior to the introduction of any new electrical equipment.

16. Control of Noise at Work Regulations 2005

Loud noise at work can damage hearing therefore, measures have to be put in place to prevent or reduce risks from exposure to noise at work. It can also be a safety hazard at work, interfering with communication and making warnings harder to hear.

The Regulations require the employer to assess the risks to your employees from noise at work; take action to reduce the noise exposure that produces those risks; provide your employees with hearing protection if you cannot reduce the noise exposure enough by using other methods; make sure the legal limits on noise exposure are not exceeded; provide your employees with information, instruction and training; carry out health surveillance where there is a risk to health.

The Noise at Work Regulations 1989 have been revised and the new 2005 updated legislation comes into force on 6th April 2006 (with the exception of the music and entertainment sectors where the Regulations come into force on 6th April 2008).

1. The new Regulations require employers to take specific action at certain action values (previously called action levels). These relate to:

⌚ the levels of noise employees are exposed to averaged over a working day or week (e.g. use of weekly exposure would be appropriate in situations where noise exposures varied markedly from day to day e.g. gardening staff using power tools on two days of the week); and,

⌚ the maximum noise (peak sound pressure – noises due to impacts e.g. hammering, pneumatic impact tools) to which employees are exposed in a working day.

Noise levels are measured in decibels (dB) and the following new values are:

a. **Lower exposure action values:**

⌚ daily or weekly exposure of **80dB** (previously 85dB);

⌚ peak sound pressure of **135dB**.

b. **Upper exposure action values:**

⌚ daily or weekly exposure of **85dB**;

⌚ peak sound pressure of **137dB**.

Exposure limit values: (these are levels of noise exposure which must not be exceeded) daily or weekly exposure of **87dB**, peak sound pressure of **140dB**. These exposure limit values take account of any reduction in exposure provided by hearing protection ie personal protective equipment.

2. There is a new specific requirement to provide **health surveillance** where there is a risk to health.

Hearing protection must now be made available where there is exposure above the new lower exposure action value (80dB).

Hearing protection must be worn and a programme of control measures (see below) implemented where there is exposure above the new upper exposure action value (85dB).

Noise assessments will require to be reviewed to take into account the changes in the action levels. (See below).

Health surveillance must be provided for all individuals, staff or students where there is a risk to health from exposure to noise e.g. employees who are likely to be regularly exposed above the upper exposure action values, or are at risk for any reason, e.g. they already suffer from hearing loss or are particularly sensitive to damage. More information on health surveillance is available from the University's Occupational Health Service. If you have any concerns regarding occupational noise induced hearing loss or tinnitus (ringing or buzzing in the ears) please contact the Occupational Health Service on extension (JA) 4824 or email occupationalhealth@strath.ac.uk

The implementation of these Regulations can be quite complex and advice should be obtained from the Safety Officer by anyone affected by them.

17. Buildings and Equipment

Building structural faults should be brought to the attention of the University's Estates Management Department.

The safety and installation of electrical equipment and the clearance of electrical faults up to the normal 13 Amp socket outlets are the responsibility of the University's Electrical Engineer who is based in Estates Management.

18. Radiation Hazards

Radiation Hazards are the responsibility of the Area Radiation Protection Supervisors. The identities and locations of current post-holders can be obtained from your Departmental Safety Convener.

19. Compressed Gas Safety

Only persons within the Department who have been specifically trained may transport, attach or detach gas cylinders from equipment. These persons will follow the University Guidance on Compressed Gas Safety (15th December 2009).

Appendix 2

Access to University Premises - John Anderson Campus

- 6.7.1 The University Court has approved the following regulations to control access to premises belonging to or in the occupation of the University in order to balance the need for access on the one hand and considerations of general and personal safety (of users), security (of property), and economy (in light, fuel and security staff) on the other.
- 6.7.2 The normal hours of access to departmental accommodation are as follows:
- | | |
|-----------------------|--|
| Monday-Friday | |
| Andersonian Library | (as stated in Regulation 3.5 of the University Calendar) |
| Computer Centre | 0800-2200 |
| | Sports Centre (as stated in the Regulations of the Centre for Sport and Physical Activity) |
| All other departments | 0800-1800 |
- 6.7.3 Some University buildings may be open beyond 1800 hours. Nevertheless, the normal hours of access for departmental accommodation is 0800-1800 hours. Every other time is considered outwith normal working hours.
- 6.7.4 Saturdays, Sundays and public holidays are considered to be outwith normal hours of access.
- 6.7.5 Academic, senior administrative and academic related staff are granted automatic rights of access outwith normal hours of access (please see the above) to communal accommodation and departmental accommodation within the area with which they are identified.
- 6.7.6 Estates Management personnel are granted automatic rights of access outwith normal hours of access (please see above) to communal accommodation and departmental accommodation, normally by prior arrangement with the Head of Department or other departmental staff responsible for the departmental accommodation. However, obviously, in an emergency, for example, flood, Estates Management staff may have to enter departmental accommodation without prior notification. It is, therefore, imperative that any hazardous operations or particularly hazardous material which by necessity is left on open benches be appropriately labelled.
- 6.7.7 Computer Centre staff are granted automatic rights of access outwith normal hours of access to all areas where that department has computer and communications equipment.
- 6.7.8 University Safety Services personnel are granted automatic right of access to all University accommodation at all times.
- 6.7.9 Research fellows, research assistants, individual postgraduate students and members of the technical, secretarial, clerical and manual staff may be granted rights of access to communal accommodation and departmental accommodation outwith normal hours of access. Buildings may be open until 2200 hours but permission (for those who require it) to enter departmental accommodation is required from the Head of Department or their deputy. Individual undergraduate students may also be granted such rights of access through the same procedure. The levels of access available are as follows:
- (1) Unlimited Access
 - (i) An unlimited authorisation access card (RED) must be issued by the department and signed by the Head of Department or their deputy and the person being granted access.
 - (ii) The department and those areas specified within it which have been authorised for entry must be stated on the card.
 - (iii) The card may be valid for up to one year from issue. However, the expiry date must be shown on the card.
 - (iv) The card is only valid if used in conjunction with an unexpired student/staff identity card or other photographic identification.

- (v) The card is issued on the understanding that the cardholder has read and understood that part of the appropriate Departmental Safety Regulations pertaining to out of hours working.
- (vi) Unlimited access should only be granted when considered essential by the Head of Department.
- (vii) Requests for red cards for lab access must be accompanied by a risk assessment (S20 form) and a red card request form (see pages 54 and 55) signed by the project supervisor.

ANY BREACH OF REGULATIONS WILL RESULT IN IMMEDIATE CANCELLATION OF OUT OF HOURS ACCESS AND DISCIPLINARY PROCEEDINGS.

Computer Centre Access

- 6.7.10 RED card access needs a countersignature by Computer Centre staff as well as Head of Department signature.

Temporary Rights of Access

- 6.7.11 The Head of a Department or, in their absence, a deputy previously authorised by the Head of Department may, exceptionally, grant temporary rights of access to departmental accommodation, including laboratories and workshops, outwith normal hours of access for a maximum period of one year at a time to a named visitor of not less than 16 years of age in respect of an individual person deemed by the Head of Department on their own responsibility to be suitable.
- 6.7.12 Some departmental equipment may only, by statute, be used by persons over 18 years of age. The Head of Department must ensure the visitor granted access is fully aware of all appropriate University/Departmental Safety Regulations and Procedures including evacuation.
- 6.7.13 The name of the visitor granted access and a note of the duration of the access granted must be lodged with Security Control.
- 6.7.14 Members of staff and students who would normally need RED CARD access are exempt from this requirement when attending social functions authorised by the Head of Department, in departmental rest areas, for example, common rooms, tea rooms, etc. This exemption is only valid until 2200 hours. If it is expected that the function will continue after this time, special permission must be granted by the Chief Operating Officer. Please see Regulation 6.7.15.
- 6.7.15 The Chief Operating Officer may, exceptionally, grant temporary rights of access to persons other than those granted rights of access under previous Regulations for the purpose of attending specific meetings, examinations or other functions on University premises. When temporary rights of access are so granted Security Control must be notified.
- 6.7.16 Departmental Safety Regulations must make adequate provision for the health and safety of all persons using departmental premises outwith normal hours of access as defined in the Regulations above.
- 6.7.17 All persons granted rights of access who use premises outwith normal hours must inform Security Control of their intention to enter, remain in or leave the premises in order that the security staff may arrange for them to be granted access to or exit from the building concerned. They must also record their presence on the premises either by telephoning Security Control or by signing the log book at Security Control (or, in the case of the Royal College, the James Weir or Thomas Graham Building, the log book held at the James Weir Building, Montrose Street entrance) before they enter the premises. All University staff must carry a University staff identity card or other photographic identification. Students must carry a current student identification card plus the appropriate departmental authorisation (for example, BLUE or RED card). Persons using premises outwith normal hours of access may be refused entry or requested to leave by a member of the Security or University Safety Services staff if they cannot show proof of identity.
- 6.7.18 Security staff must check periodically the safety of individuals recorded as being on the premises outwith normal hours of access.
- 6.7.19 Persons using premises outwith normal hours of access must have access to a telephone in order to contact Security Control in the event of an emergency.

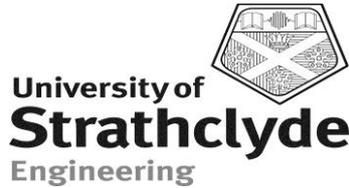
- 6.7.20 Operations outwith normal working hours which have been assessed and identified as having a particular risk associated with them must have appropriate control measures in place to handle the foreseeable consequences of the work.
- 6.7.21 Abuse of the system may result in confiscation of the access card and identity card by Security or Safety Services personnel.

Children - Special Access

- 6.7.22 Children (persons under the age of 16) are permitted to enter the office accommodation and sports and recreational facilities of the University during the normal hours of access. Access to University premises is only permitted if accompanied by a parent or other responsible adult. Outwith normal working hours, children may be allowed access to office accommodation only; they must be accompanied by the parent or legal guardian who must directly supervise the child.
- 6.7.23 Children are not permitted to enter laboratories or workshops or other accommodation whose sole means of access is by way of a laboratory or workshop unless for the purpose of attending a supervised course, demonstration or exhibition in which case all sources of potential hazard will have been removed or rendered safe by other means.

Pet Animals

- 6.7.24 Pet animals of any nature may only be brought on to University premises under extraordinary circumstances. A Head of Department, on advice from a Departmental Safety Convener, may exceptionally authorise access to department premises in which case the animal must be kept under the direct supervision of the owner or other responsible person. A guide dog accompanying a blind person will normally be permitted unrestricted access to University premises but the nature of equipment in certain areas may make it necessary to deny access to such guide dogs.



DEPARTMENT OF MECHANICAL & AEROSPACE ENGINEERING

RED CARD FORM

**Request for a Red Card for After Hours Work
(6PM – 10PM MON-FRI; 9AM-5PM SAT/SUN & HOLIDAYS)**

JAMES WEIR BUILDING

Please complete the following and make two copies. The Safety Convener will retain the original. A copy should be passed to your supervisor and one kept by yourself for reference.

Is this Red card (permission to be in the building after hours);

- A) being issued to allow the researcher to conduct non-hazardous work and/or paper work?
- B) being issued to allow the continuation of practical work (covered by your scheme of work) involving chemicals or hazardous equipment?
[If you are unclear if the latter applies, you are directed to your S20 form. You and your supervisor need to be clear that your after-hours activities do not pose a risk to Health as defined by section E.]

Date:

Name:

Supervisor(s):

Area(s) of the building to which access is requested (floors and/or labs):

.....

For all persons requesting access for activities associated with A only (no partner required)

In return for permission to be in the building after hours, I agree to register my presence with Security on every occasion that I work out of normal hours (6pm - 10pm Mon-Fri; or 9am-5pm Sat/Sun or when the University is officially closed)

Signature

For all persons requesting access for activities associated with B.

In return for permission to be in the building after hours, I agree to register my presence with Security on every occasion that I work out of normal hours (6pm - 10pm Mon-Fri; 9am-5pm Sat/Sun or when the University is officially closed).

It is understood that I can only work when I have a partner who is prepared to remain in the building until my activity has been completed. The onus is on me to ensure that this person has been identified prior to 6pm weekdays and 6pm Fri for Sat & Sun work or for days when the University is to be officially closed.

The programme of work to be conducted will be discussed in advance and approved by my supervisor or his/her nominee prior to its commencement.

Signature

Supervisors

It is my wish that the above be provided with permission to work out of normal hours. Where the researcher has requested access to continue practical work, the programme will have been approved in advance. I understand that I have a duty of care (defined in the area safety regulations Sec. 9) to the researchers under my direction working after hours.

Signature Date:.....

The department will not be held responsible for any accident or incident which occurs should you deviate from the above. Should you be found within the building working alone after hours on activities covered by section B, your permission to work out of normal hours will be withdrawn.

Key to Buildings

See <https://www.strath.ac.uk/estates/admin/roombooking/buildingcodes/> for up-to-date details.

Prefix	Building Name
AB	Robertson Wing, John Arbuthnott Building (SIPBS)
AQ	Lord Todd Building
AR	Architecture Building
AT	Alexander Turnbull Building
BH	Barony Hall
CL	Collins Building
CSR	Sports Centre
CU	Curran Building (Library)
CV	Colville Building
CW	Cathedral Street Wing (Business School)
DW	Sir William Duncan Wing
GH	Graham Hills Building
HD	Henry Dyer Building
HW	Hamnett Wing, John Arbuthnott Building (SIPBS)
JA	John Anderson Building
JW	James Weir Building
LH	Lord Hope Building
LT	Livingstone Tower Building
MC	McCance Building
RC	Royal College Building
SP	St Pauls Chaplaincy Centre
SW	Stenhouse Wing (Business School)
TG	Thomas Graham Building
UC	University Centre
USSA	Students' Union
WC	Wolfson Centre
WD	Sir William Duncan Building