Queen Mary University of London

Science and Engineering Foundation Programmes Handbook

2024-25

This handbook is for all students enrolled on Year 0 of a Science and Engineering Programme with Foundation or an International Science and Engineering Foundation Programme

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Section 1: Disclaimer & Important Reminders

1.1. How to use this handbook and alternative formats

This Foundation handbook should be used together with the Academic Regulations and the Queen Mary Student Handbook.

This handbook provides information specific to the Science and Engineering Foundation Programmes, while the Queen Mary Student Handbook provides information common to all students at Queen Mary. The Academic Regulations provide detailed information on progression, award and classification requirements.

Nothing in this handbook overrides the Academic Regulations, which always take precedence.

The Academic Regulations are available online at: http://www.arcs.qmul.ac.uk/policy/

This is a digital document that can be enlarged on your device. If you have other requirements for the handbook, please contact the Foundation Team, fedu@qmul.ac.uk.

1.2. Disclaimer

The information in this handbook is correct as of September 2024. In the unlikely event of substantial amendments to the material, we will attempt to inform you of the changes.

These changes will generally be announced using one or more of the following methods:
Emails sent to your Queen Mary e-mail account
Posting messages on the Foundation Support QMplus page:
https://qmplus.qmul.ac.uk/course/view.php?id=3829

Queen Mary cannot accept responsibility for the accuracy or reliability of information given in third-party publications or websites referred to in this handbook.

1.3. Important Reminders

Remember to regularly check the following programme website for announcements:
https://qmplus.qmul.ac.uk/course/view.php?id=3829

This website is an important source of additional information about the programme, the modules that you will be taking and other facilities at Queen Mary. You must look at this website regularly.

Remember also to regularly check your Queen Mary e-mail account for messages.
When using e-mail to contact staff, please observe the following points:

- You must use your Queen Mary e-mail account. Staff cannot respond to private email Addresses.
- You must give your full name and Student ID number.
- You should write your email clearly, using formal English and appropriate email format.

Section 2: Preliminary Information

2.1. Director's Welcome

Science and Engineering Degrees with Foundation Year* and the International *Science and Engineering Foundation Programme (ISEFP)

Welcome to our students on the Science and Engineering Degrees with Foundation Year and the International Science and Engineering Foundation Programme at Queen Mary, University of London (QMUL).

Our Science and Engineering Degrees with Foundation Year are integrated four-year programmes of study. Successful completion of the foundation year enables you to continue (without further UCAS application) onto study for a BEng Honours degree in a branch of engineering or a BSc Honours degree in a branch of science or mathematics.

The International Science and Engineering Foundation programme is a standalone one-year programme for overseas students which leads to a Level 3 qualification known as the Foundation Certificate or FdCert. This allows students to move onto a BEng Honours degree in a branch of engineering or a BSc Honours degree in a branch of science or mathematics.

The style of teaching in universities is different from the teaching methods used in most schools or colleges, and you will need to take more responsibility for your studies (*i.e.,* become a more "independent learner"). You will find the programme to be challenging, and we expect you to work hard and spend about 40 hours per week on your academic studies during term time. You must also expect to do some work during vacations, especially the Christmas and Easter vacations which are your main opportunities to revise for the end of term examinations which take place in May/June. The Foundation Year provides an excellent preparation for further study in the science and engineering fields, and many past students who have completed the year, have excelled in their studies to obtain first-class degrees.

This handbook provides you with essential information about the Foundation Year. It contains amongst other things, staff contact details, information regarding the various modules that you will be studying, rules and regulations concerning examinations and other assessments (tests and assignments), as well as general information about the participating Schools and/or support services. You will need to refer to this handbook regularly throughout the course.

The Foundation Year is administered on behalf of the five schools in the Faculty of Science and Engineering by the Foundation Education Development Unit (FEDU). If you have any queries or complaints about any aspect of your year, then we are here to listen and to try to help. Your first point of contact should normally be your advisor in your school, alternatively you can email the Foundation team at fedu@qmul.ac.uk and we will get back to you as soon as possible.

We wish you an enjoyable and successful time at Queen Mary.

Dr Giorgio Chianello
Director of Foundation Education

2.2. Dates and Deadlines

For 24/25 the main semester and examination dates are as follows:

Semester and Exam Period	**Dates**
Welcome Week	16th – 20th September 2024
Semester A Teaching	23rd September 2024– 13th December 2024
Semester B Teaching	22nd January 2025 – 15th April 2025
Semester B Examination period	**8th May 2025 – 6th June 2025**
Late Summer Exam period	4th August – 15th August 2025 (for resit and deferred first sit exams).

These and other key Queen Mary dates are available online at www.qmul.ac.uk/about/calendar/

Extenuating Circumstances (EC) Deadlines

EC Type	**Deadline Date**	**Outcome Release**
Semester A Coursework EC	18th December 2024	Within 7 days
Semester B Coursework EC	23rd April 2025	Within 7 days
May Exam EC	11th June 2025	Mid-July
August (Resit) Exam EC	20th August 2025	Early September

Exam Board Dates & Dates of Official Results & Transcripts Release

May Exams	**Date**
Foundation Exam Board	Late June
Official Results Release	10/07/2025
Official digital transcripts (HEAR) available to access via students Gradintelligence account at: Gradintel.com	Late July

August /Resit Exams	**Date**
Foundation Exam Board	Late August
Official Results Release for continuing students	9th September 2025
Official Results Release for Finalists i.e. ISEFP	23rd September 2025

Deadlines for Interruption and Withdrawal (SEMA & SEMB)

Event	**Deadline Date**
Deadline for students to apply for interruption of study/withdrawal from study prior to SEM A examinations	5th January 2025
Deadline for students to apply for interruption of study/withdrawal from study prior to SEM B examinations.	7th May 2025

Other Key Dates

Event	**Date**
Deadline for submission of applications for Exam Access Arrangements for May examinations (for students who are entitled to extra time etc).	Mid-March
Publication of university's Summer (May) Examination Timetable	24th March 2025
Publication of Late Summer (August) Examination Timetable	18th July 2025

Section 3: Foundation Unit Information

3.1. Contact Details

Your main point of contact for administrative matters is the Foundation Year & ISEFP Administration team.

Foundation Year & ISEFP Administration team:

- Foundation Year Officer: Sarahlouise Lawrence
- Foundation Year Administrator: Rosie Enobakhare

We do not have a permanent office base. However, we are always contactable via our shared email inbox. Students are also able to book a 20-minute online meeting with us via our dedicated online booking system.

Foundation Team Contact Details:
Shared E-mail: fedu@qmul.ac.uk
Online meeting booking link: Online Student Meeting Link
QMPlus: Science and Engineering Foundation Page

Academic Director Foundation Year:
Dr Giorgio Chianello, director-of-foundation-se@qmul.ac.uk

Foundation Senior Tutor
Dr Anum Khalid, anum.khalid@qmul.ac.uk

School Offices & Foundation Year Contacts

School Contact	Contact Details
School of Biological & Behavioural Sciences **Dr Chris Faulkes**	School Office - 1st floor G.E. Fogg Bldg. (c.g.faulkes@qmul.ac.uk)
School of Engineering & Materials Science **Dr Raza Shah**	School Office – 3rd floor Engineering Bldg (raza.shah@qmul.ac.uk)
School of Mathematical Sciences **Dr Lubna Shaheen**	School Office – 1st Floor Mathematics Building (l.shaheen@qmul.ac.uk)
School of Physical and Chemical Sciences **TBC**	School Office – 1st Floor G.O. Jones Bldg
Foundation Year English Language & Communication Skills Co-ordinator (CST) **Sharon Turner**	Bancroft Building – 1st floor (Sharon.Turner@qmul.ac.uk)

Campus Map (Mile End):
The Mile End campus map is available at: Mile End Campus Map

3.2. Communications

Queen Mary will communicate with you in a variety of ways. Formal correspondence will be sent to you by electronic letter, and it is important that you keep Queen Mary up to date with your personal details and

address. You can do this online via the MySIS record system: http://www.arcs.qmul.ac.uk/students/mysis-record/index.html.

It is most common for Foundation Year staff, Queen Mary, and the Students' Union to contact you by your Queen Mary email. You are assigned a university email address when you enrol, and you are responsible for checking this account daily. All major notifications and updates will be sent to you by email first.
You can access your email account by logging on to a Queen Mary computer, or, if you are not on campus, at: https://mail.qmul.ac.uk.

More generally, as a student of Queen Mary you are expected to take responsibility for your studies. This includes keeping yourself informed about the programme requirements and procedures, and about any day-to-day changes in the timetable, lecture venues etc. **We CANNOT take responsibility for you missing vital information if you have not checked your QM email, timetable or QMPlus.**

Communication with relatives: Please be aware, and please inform your relatives, that university students are regarded as adults and therefore to safeguard your personal data, it is Queen Mary policy not to divulge any information concerning your progress or attendance to parents, guardians, or other relatives. The only exception would be if you have given your prior agreement e.g., if you are present with your relatives or if you have given written permission to us to respond to enquiries from your relatives.

3.3. Advisor/Student Support

Advisors

All students are allocated an Advisor by their home school. In some cases, this Advisor may be the Foundation Year contact for the school but in other cases your Advisor may be another member of staff from the school. Your Advisor will fulfil a number of roles:

- they are the first point of contact between yourself and your home school (although you can also refer matters to the main Foundation Year contact for your school)
- they will advise you on matters relating to the degree programme you wish to study after the foundation year or ISEFP
- if there are matters affecting your studies on which you need advice, then they are one of the people you can turn to for help
- they will provide references upon request (although you must normally provide them with at least 2 weeks before any deadline)

Advisor-Student meetings will be held regularly throughout the year, and it is essential that you attend these meetings. You can also contact your Advisor to arrange ad hoc meetings, if you have an urgent matter you wish to discuss.

You will find your allocated Advisor on MySIS. Please let us know if you have not been assigned an Advisor.

Foundation Year Administration Team

If you need information or advice about matters relating to the programme organisation, the scheduling of lectures and tutorials, or similar matters, then you should contact the Foundation Year Administration Team at fedu@qmul.ac.uk

3.4. Safety and Emergencies

You should familiarise yourself with emergency procedures for all areas in which you study, noting the location of emergency exits, assembly points and equipment. On hearing a fire alarm in a QM building, you should immediately leave through the nearest emergency exit, unless redirected by a Fire Marshal. Do not go to any other part of the building for any reason. Proceed to the designated emergency assembly area and report to the Fire Marshal. Do not leave the assembly area or re-enter the building until instructed to do so. Failure to follow these procedures may lead to disciplinary action.

Tampering with fire alarms or fire-fighting equipment is a serious offence, and disciplinary action may be taken against any student responsible for this.

In an emergency, dial 3333 from any internal phone and clearly state the nature and location of the problem, your name, and the number you are calling from (if known). If there is no internal phone available, call 999 and follow the normal procedure. You should ensure that corridors and doorways are not obstructed, and that firefighting equipment is not removed from its station.

First aid assistance for minor accidents can be obtained by dialling 3333 from an internal phone, or 020 7882 3333 from any other telephone.

3.5. Use of Personal Data

Personal information and data protection

Tutors may occasionally use anonymised student essays (or portions from them) as part of the teaching process. We hope you will be willing to support your fellow students by allowing this, but you may opt out by contacting fedu@qmul.ac.uk.

Section 4: Procedures

4.1. In-course Assessment (submission, extension, penalties)

Assessment Types

Most Foundation modules are assessed with a mixture of coursework and an examination. Some will be online, and some will be in-person.

Coursework is an assessment that takes place during the module. This could include in-class tests, presentations, essays, reports, quizzes on QMplus, homework, etc. At the start of each semester, it is important that you make sure you have a clear understanding of each module's coursework so that you can organise your schedule.

Submission of written work

You must submit your coursework by the specified deadline, and following the instructions provided. If you do miss a submission deadline you should still submit the work as soon as you are able to do so. However, it will be recorded as late and a penalty will be applied, unless there are valid extenuating circumstances.

If you are unable to meet a coursework deadline due to unforeseen circumstances beyond your control, then you should contact the Foundation Team (fedu@qmul.ac.uk) and/or submit an Extenuating Circumstances (EC) claim via MySIS. Completion of this form does not necessarily mean that you will be granted compensation/an extension for the missed submission of the assessment – this will be decided after due consideration of the information and any supporting documentation that you have provided.

Late submission penalties and extensions

If an assignment is submitted after the specified deadline, it shall be recorded as late and a penalty shall be applied, as detailed below. If there are valid extenuating circumstances, then the penalty may be fully or partially waived.

i. For every period of 24 hours, or part thereof, that an assignment is overdue there shall be a deduction of five per cent of the total marks available (i.e. five marks for an assessment marked out of 100). After seven calendar days (168 hours or more late) the mark shall be reduced to zero, and recorded as 0FL (zero, fail, late).

ii. A student may submit work of passing standard but fail the module because of the late submission penalty. Where the student is eligible for a resit attempt in such a case, the student shall not be required to resubmit the assessment; instead, the pre-deduction mark from the first attempt shall be entered for the resit. Where a student is not eligible for a resit, this provision does not apply.

iii. Certain assessments may cease to be a valid measure of a module's learning outcomes prior to the seven working day cut-off. For example, where feedback has been provided to the class, any submission made after that point would not be an accurate measure of attainment. In such cases, the late submission policy shall apply as normal up to the day on which feedback is given; at that point, a mark of zero (0FL) shall be applied, even if this is within seven calendar days of the deadline. Schools and Institutes must make clear to students in advance where this variant policy applies, or else the general policy shall be applied.

iv. A late work penalty may be removed where a student provides good reason for the late submission under the extenuating circumstances policy. A student must submit a formal claim with supporting evidence in line with that policy in order for the circumstances to be considered.

v. Schools and Institutes may award extensions to submission deadlines. This is at the discretion of the School/Institute. Where a School/Institute does consider the award of an extension, a student must apply before the submission date with an extenuating circumstances claim and supporting evidence. In no circumstances shall an extension set a new deadline beyond the next meeting of the relevant Subject Examination Board (though a first sit may be awarded).

4.2. Student Engagement Policy

For the timely and effective administration of support, the Foundation Team wishes to use the following markers of student engagement. This is to ensure that students are well supported and given every opportunity to progress with their studies and to achieve to their fullest potential whilst here.

1. Markers of Student Engagement

The Foundation team will monitor your engagement through the following:

1.1 **Attendance:** You are expected to attend scheduled taught sessions including lectures, classes, group work, computer lab sessions and any other events associated with your modules.

1.2 **Coursework Submission:** You are expected to submit reports, exercises essays, and other pieces of coursework associated with each module for which you are registered, by the individually advertised deadlines and method of submission. Coursework submissions will be monitored via QMplus.

1.1 **Participation in formative assessments:** You are expected to participate in a range of activities that help to inform teaching and learning during the learning process. Examples of such activities are subject related quizzes, or exercises linked to module materials on QMPlus.

1.4 **Marks from Summative Assessments:** All undergraduate students are expected to participate in a range of activities assessing the outcomes of a learning process. Provisional and/or confirmed marks allocated from such summative assessments e.g., weekly tests, coursework, and examinations, often contribute to the overall module grade.

2. Action Following Identification of Students Who May Require Support

2.1 If you are identified as approaching or falling below the minimum requirements of engagement, you will be contacted to alert you of this, outlining support mechanisms to deal with the issues that may be contributing to this.

2.2 You may also be invited to a meeting with the Foundation team, to discuss issues that might be affecting their studies, and for the provision of encouragement/advice (with possible referral to Queen Mary support services if necessary). The first port of call is either your Advisor, or the Foundation Team, who in turn may liaise with the relevant Student Support Staff.

2.3 If you are experiencing problems, we will always try to help. However, we cannot do so if we are not kept informed of these issues. If there are factors making your engagement with your programme difficult, it is

essential that you discuss these with your Advisor or with the Foundation team at an early stage. This will give us the opportunity to intervene and provide the necessary support.

4.3. Absence Notification

Short-term Absence as a Result of Illness or Other Good Reasons

You are required to attend all scheduled classes, but we understand that an occasional absence due to minor illness or short-term problem can occur.

If you are absent due to a brief period of sickness (1-2 days), it is not necessary to inform the Foundation team. Please ensure you make the necessary arrangements to catch up with any teaching activities you may have missed.

However, if circumstances beyond your control ("extenuating circumstances") prevent you from attending Queen Mary for an extended period (more than 3 working days) then you must contact the Foundation Team by e-mail as soon as possible (no later than 3 days after the start of your absence), so that we are aware of the reasons for your absence.

If you miss an assessment/s as a result of your absence, you should submit an ***EC Form via MySIS***, specifying the precise dates and reasons for the absence, and what assessments you have missed.

4.4. Deregistration

Should you consistently fail to meet programme requirements for engagement or for submission of coursework, you may be deregistered from your programme of study and will no-longer be a student of Queen Mary. This is in accordance with paragraph 2.61 of the Academic-Regulations-2024-25.pdf

In advance of deregistration, you will be sent a formal, written warning and a specified period in which you must improve your engagement, participation, or submission of assessment before deregistration from your programme of study occurs. You will also have the right to represent your case to the Foundation Team.

For further information about de-registration, please click **here.**

4.5. Interruption & Withdrawal of Studies

It is occasionally necessary for students to cease their studies temporarily or permanently, for either personal or academic reasons. This is clearly a major decision which should not be undertaken lightly; so please do discuss your difficulties with your Advisor or Foundation Year staff before making such a decision. You are also strongly advised to make an appointment with Advice and Counselling, who will be able to give you up-to-date and accurate information and advice, about the personal, financial and academic consequences of such action, and (if you are an overseas student) whether this will affect your right to remain in the UK.

Information on interruption & withdrawal of studies and be found here:

http://www.arcs.qmul.ac.uk/students/study/interrupting/index.html

http://www.arcs.qmul.ac.uk/students/study/withdrawing/index.html

https://www.qmul.ac.uk/welfare/money-and-practical-advice/making-a-change-to-your-studies/

4.6. Extenuating Circumstances

An Extenuating Circumstances guide for students can be found at https://www.qmul.ac.uk/student-experience/student-wellbeing-hub/extenuating-circumstances-a-guide-for-students/

Extenuating circumstances are defined by Queen Mary as:

> "Circumstances that are **outside a student's control** which may have a **negative impact** on a student's ability to **undertake or complete any assessment** so as to **cast doubt on the likely validity of the assessment** as a measure of the student's achievement."

Extenuating circumstances are usually personal or health problems. Health problems include your emotional wellbeing and mental health, as well as your physical health. Extenuating circumstances do not include computer problems, misreading your exam timetable, planned holidays or events, or local transport delays.

Fit to Sit Policy

Queen Mary operates a **fit to sit policy**, which covers all assessments including coursework and exams. If you sit an exam or submit a piece of coursework you are deemed to be fit to do so. In such instances a request for extenuating circumstances will not normally be considered. If you do not feel you are well enough to attend an invigilated exam, then you should not attend and should submit a claim for extenuating circumstances instead.

EC Submission Process

To submit an extenuating circumstance request you must submit a claim via the Extenuating Circumstances section of MySIS. Once you have submitted the claim you will be able to check the progress and will be notified of any decisions or enquiries made.

Standard EC Claim

If you are submitting a **standard EC** claim it must be accompanied by **relevant supporting evidence** (for example medical certification, death certificate, police report and crime number, or other written evidence from a person in authority). Please note that although accompanying documentation can be submitted after the EC form, claims for EC that are not supported by appropriate documentary evidence **cannot be considered.** It is in your best interest to provide evidence and supporting documentation that is as comprehensive as possible.

Self-certification

You are entitled to self-certify on up to **three occasions** each academic year; each self-certification can cover a period of up to **seven calendar days from the assessment deadline.** This means completing and submitting the Queen Mary self-certification form in place of independent evidence. Please note that self-certification does not mean automatic approval of a claim – the School/Institute will consider it in the normal way and will need to be satisfied of the validity of the claim and satisfied that it justifies the outcome. Any claims beyond those three must be accompanied by evidence, as described above.

When you submit an EC form you will be issued with a receipt via email. All claims must be received no later than three working days before the relevant examination board meeting otherwise they cannot be considered.

All extenuating circumstances claims are kept confidential until they are considered by a subcommittee of the School/Institute's Subject Examination Board. All proceedings of the subcommittee are strictly confidential and will not normally be discussed at the full examination board meeting.

It is **your own responsibility** to submit any claims for extenuating circumstances. Please ensure that if you have what you believe is a valid case for ECs, you complete the submission process in accordance with Foundation Year guidelines and deadlines.

It is not possible to make a retrospective claim for ECs, specifically once you know your results of any assessment that might have been affected. Consequently, claims for ECs submitted after the deadline will **not** be considered by the EC panel.

4.7. Code of Conduct

Code of Student Discipline

The Code of Student Discipline applies to any action of misconduct whether it takes place on or off Queen Mary premises. The Code also applies to actions that are electronic and occur via electronic means such as (but not limited to) the internet, email, social media sites, chat rooms or text messages. Please refer to Code of Student Discipline: http://www.arcs.qmul.ac.uk/students/student-appeals/misconduct/

Report + Support: tackling harassment, gender-based violence and hate crime

Queen Mary is committed to creating an environment for work and study where staff and students are treated with dignity and respect. We have no place for bullying, harassment and hate. We recognise that these behaviours can take *many forms*. Any allegation of harassment, hate crime, bullying or victimisation will be treated seriously, regardless of the seniority of those involved, and anyone found to have behaved unacceptably may be the subject of disciplinary action subject to the processes detailed in the relevant *Queen Mary policies*.

Report + Support is our secure online platform for anyone at Queen Mary to report harassment, gender-based violence or hate crime, and find out about support options. If you have experienced or witnessed any form of bullying, harassment, violence or hate crime, please see *reportandsupport.qmul.ac.uk*.

All members of Queen Mary have a collective responsibility to: encourage a culture of dignity and respect; to treat others fairly, with courtesy and consideration; and to challenge inappropriate behaviour when it is safe to do so. More information can be found here: *https://reportandsupport.qmul.ac.uk/campaigns/our-commitment*.

4.8. Representation

Your views are important to the Foundation team and Queen Mary. There are a variety of ways in which you can tell us what you think and share your ideas for improvements and raise any concerns. Become a Course Rep, elected by fellow students, also speak on behalf of the student body at the School, Faculty and Queen Mary-wide level via various committees, groups and meetings. Some of the main methods are outlined below. More information can be found at: https://my.qmul.ac.uk/your-voice/feedback/

- Student Voice Committee
- Foundation Feedback Survey
- Module Experience surveys
- Course representatives
- Personal feedback to tutors

Section 5: Programmes and Modules of Study

5.1 Programme Structures

There are seven Science & Engineering Foundation pathways, each with a 4-year integrated programme and 1-year international programme.

The modules taken by each pathway are shown in the table below. All modules are 15 credits except SEF040/41 which are double modules, each worth 30 credits.

		Foundation Pathways						
		Biological Sciences	Chemical Sciences	Electronic Engineering	Engineering	Materials Science	Mathem-atics	Physics
Modules	SEF030 Communication in Science and Technology	✓	✓	✓	✓	✓	✓	✓
	SEF040 Mathematics A	✓	✓					
	SEF041 Mathematics B			✓	✓	✓	✓	✓
	SEF042 Science & Engineering Success	✓	✓	✓	✓	✓	✓	✓
	SEF043 Foundations of Chemical Science	✓	✓	✓	✓	✓	✓	✓
	SEF044 Foundations of Physical Science	✓	✓	✓	✓	✓	✓	✓
	SEF045 Foundations of Biological Science	✓	✓					
	SEF046 Foundations of Engineering	✓	✓	✓	✓	✓	✓	✓
	SEF047 Further Mathematics			✓	✓	✓	✓	✓

5.2 Progression Requirements

As a student on the Foundation Year, you are guaranteed progression into year 1 of your degree programme provided **you meet the academic criteria for progression** outlined in the tables below. You do not need to reapply through UCAS.

If you complete the year without meeting the progression requirements, you will be offered the Foundation Certificate (FdCert) as an exit award, providing you pass 105 credits (6 modules) including SEF030 and SEF040/41.

Home School	Programme Code	Programme Title
School of Biological and Behavioural Sciences (SBBS)	CCX2	BSc Biological Sciences with Foundation
	FGH2	ISEFP (Biological Sciences)

For progression onto Biology, Biochemistry, Medical Genetics or Zoology:

- Pass 105 credits including SEF030 Communication in Science and Technology, SEF045 Foundations of Biological Science and SEF040 Mathematics A.
- Achieve an overall mean average of **50%** across all modules.
- Achieve at least 60% in SEF043 Foundations of Biological Science and 50% in SEF040 Mathematics A

For progression onto Biomedical Sciences, Psychology, Neuroscience or Pharmacology and Innovative Therapeutics:

- Pass 105 credits including SEF030 Communication in Science and Technology, SEF045 Foundations of Biological Science and SEF040 Mathematics A.
- Achieve an overall mean average of **60%** across all modules.
- Achieve at least 60% in SEF043 Foundations of Biological Science and 50% in SEF040 Mathematics A

Home School	Programme Code	Programme Title
School of Physical and Chemical Sciences (SPCS)	FFX2	BSc Chemical Sciences with Foundation
	FGH3	ISEFP (Chemical Sciences)

For progression onto Chemistry or Pharmaceutical Chemistry

- Pass 105 credits including SEF030 Communication in Science and Technology, SEF043 Foundations of Chemical Science and either SEF040 Mathematics A.
- Achieve an overall mean average of **50%** across all modules.
- Achieve at least 60% in SEF043 Foundations of Chemical Science and 50% in SEF040 Mathematics A

Home School	Programme Code	Programme Title
School of Physical and Chemical Sciences (SPCS)	FFX0	BSc Physics with Foundation
	FGH5	ISEFP (Physics)

For progression onto Physics or Astrophysics

- Pass 105 credits including SEF030 Communication in Science and Technology (if taken), SEF044 Foundations of Physical Science and SEF041 Mathematics B.
- Achieve an overall mean average of **50%** across all modules.
- Achieve at least 60% in SEF044 Foundations of Physical Science and 50% in SEF041 Mathematics B.

Home School	Programme Code	Programme Title
School of Mathematical Sciences (SMS)	GGX2	BSc Mathematics with Foundation
	FGH4	ISEFP (Mathematics)

For progression onto Mathematics, Actuarial Science, Mathematics and Statistics or Mathematics with Finance and Accounting

- Pass 105 credits including SEF030 Communication in Science and Technology (if taken), SEF047 Further Mathematics and SEF041 Mathematics B.
- Achieve an overall mean average of **50%** across all modules.
- Achieve at least 55% in SEF047 Further Mathematics and 60% in SEF041 Mathematics B.

Home School	Programme Code	Programme Title
School of Electronic Engineering and Computer Science (EECS)	HHX0	BEng Electronic Engineering with Foundation
	FGH9	ISEFP (Electronic Engineering)
For progression onto Electrical and Electronic Engineering or Computer Systems Engineering. • Pass 105 credits including SEF030 Communication in Science and Technology, SEF046 Foundations of Engineering and SEF041 Mathematics B. • Achieve an overall mean average of **50%** across all modules. • Achieve at least 50% in SEF046 Foundations of Engineering and 55% in SEF041 Mathematics B.		

Home School	Programme Code	Programme Title
School of Engineering and Materials Science (SEMS)	HHX3	BEng Engineering with Foundation
	FGH6	ISEFP (Engineering)
For progression onto Biomedical, Chemical or Robotics Engineering: • Pass 105 credits including SEF030 Communication in Science and Technology, SEF046 Foundations of Engineering and SEF041 Mathematics B. • Achieve an overall mean average of **50%** across all modules. • Achieve at least 50% in SEF046 Foundations of Engineering and 55% in SEF041 Mathematics B. For progression onto Aerospace or Mechanical Engineering: • Pass 105 credits including SEF030 Communication in Science and Technology, SEF046 Foundations of Engineering and SEF041 Mathematics B. • Achieve an overall mean average of **60%** across all modules. • Achieve at least 60% in SEF046 Foundations of Engineering and 60% in SEF041 Mathematics B.		

Home School	Programme Code	Programme Title
School of Engineering and Materials Science (SEMS)	JJX3	BEng Materials Science with Foundation
	FGH7	ISEFP (Materials Science)
For progression onto Materials Science and Engineering • Pass 105 credits including SEF030 Communication in Science and Technology, SEF046 Foundations of Engineering and SEF041 Mathematics B. • Achieve an overall mean average of **50%** across all modules. • Achieve at least 50% in SEF046 Foundations of Engineering and 55% in SEF041 Mathematics B.		

Important: Although the information in this handbook is accurate at the time of publication, aspects of it may be subject to modification and revision. The inclusion of a progression option in this handbook is no guarantee that it will be available for progression (programmes are occasionally withdrawn at short notice).

5.3. Module Descriptions

SEF030 Communication in Science & Technology (CST)

Module Organiser:	Sharon Turner (Language Centre, STA)
Scheduled Classes:	2 X 2-hour workshops per week with the Language Centre tutors.
Expected Background:	Students with English as their first language and students with IELTS 6.0.

Module Description & Aims

This module addresses communication skills for scientists, engineers and mathematicians, and also seeks to reinforce other generic skills of a more technical nature. Topics covered include study skills, academic writing, data presentation and analysis, information retrieval, and oral communication skills based on the work STEM students need to undertake in their undergraduate programs.

Module Synopsis

Workshop Topics with the language Centre

- Basic study skills: time and project management; reading skills; group work.
- Academic writing: preparation and writing of short texts and longer reviews; elements of good style and grammar; critical thinking; structure and style of reports; plagiarism, referencing and bibliographies.
- Topics in contemporary science
- Oral communication: preparation and presentation of talks, effective speaking and debate.
- Data presentation, interpretation and analysis
- Electronic information sources, search techniques & data retrieval

Learning Outcomes

By the end of the module students should be able to:

- Manage their study time and group work effectively.
- Assimilate information from lectures, academic journals and other sources in an effective manner.
- Express themselves clearly in the language, discourse and vocabulary of their chosen scientific discipline.
- Give a well prepared and structured oral presentation to a non-specialist audience and to a group of specialist peers.
- Present data through a variety of genres in a readily assimilated fashion, and in accordance with scientific conventions.
- Undertake research in conjunction with the library and other resources and write assignments in a suitable style with a suitably referenced bibliography.

Assessment Details and Completion Requirements

This module is assessed by coursework, including assignments associated with the workshops, writing assignments (including scientific posters, a case study and a reflection) and exercises relating to discussion and presentation. There is no final examination. Students must achieve an overall mark of at least 40% in order to pass this module.

Resits: Students who fail the module at the first attempt are required to submit a 1,000-word written assignment. The deadline for this assignment is to be confirmed.

Recommended Textbooks

Study Skills Handbook, *Skills for Success* and *Critical Thinking Skills*; all by Stella Cottrell

Additional Information

Some students who register for this module may be advised at the beginning of the semester that they would benefit from extra assistance with their English communication skills. Such students may be required to attend additional tutorials (over and above the scheduled classes mentioned above) as part of the completion requirements for this module.

SEF040 Mathematics A

Module Organiser / Lecturer(s):	Dr Anum Khalid
Scheduled Classes:	Semester 1 and Semester 2 One 2-hour exercise lecture per week, one 1-hour tutorial class per week, one 1-hour optional (support) Q&A class per week and one 1-hour optional drop-in (office hours) per week.
Expected Background:	Students should have at least GCSE Mathematics C or equivalent.

Module Description & Aims

In Semester 1 the module reviews mathematical notation, basic principles of arithmetic and algebra including ideas of accuracy and precision, coordinate geometry and trigonometry; and demonstrates how these principles may be applied to solve problems in science and mathematics. In semester 2, the knowledge on topics such as algebra and geometry and further complemented by knowledge on functions and vectors as well as seeing an introduction to the two key areas, calculus and statistics.

The module aims to enable students to reinforce an extend their mathematical knowledge and in conjunction with the more advanced mathematical topics covered in semester 2, to provide students with the minimum level of mathematical knowledge and skills needed to successfully undertake a degree in the fields of science and engineering.

Module Synopsis

Numbers: Standard Notation, significant figures, decimal places. Precision and accuracy. Estimating.

Algebra: Mathematical symbols and notation. Essential arithmetic. Elementary algebra: factorisation, algebraic fractions, rearranging formulae and substitution. Square roots. Theory of powers (indices). Linear and quadratic equations. Simultaneous equations. Logarithms and exponentials. Review of quadratic equations and quadratic functions, factorisation, logarithmic and exponential equations. The Sigma notation. Arithmetic and geometric progressions, the sum to infinity of a convergent geometric progression. Polynomials and monomials: Inequalities involving the modulus sign.

Plane, Coordinate Geometry and Vectors: Properties of straight lines. Points in a plane, distance and mid-point between two points, coordinates of a point dividing a line in a given ratio, gradient, parallel and perpendicular lines. Equation of a straight line: various forms of equation of a line, including the general form; the angle between lines, conditions for lines to be parallel or perpendicular; points of intersection of straight lines. Coordinates in 3 dimensions. Length. Addition, subtraction, scalar multiplication, dot product.

Trigonometry: The three trigonometric ratios. Solving triangles: sine and cosine rules, formulae for the area of a triangle. Definition of the functions for an acute angle and extension to any angle. Graphical representation of the functions. Basic relationships between trigonometric functions. Applications of trigonometry: heights and distances. Angular measure: degrees, radians; Inverse trigonometric functions. Graphical solution of trigonometric equations.

Functions: Functions, composite functions; inverse functions. The modulus of a function. Determination of the range or image set of a function. Odd and even functions; periodic functions, rational functions. Limits and asymptotes of functions. The algebraically defined exponential and logarithmic functions.

Calculus: Fundamental elements of differential calculus; the derivative of a function, gradient at a point on a curve, the general gradient function, instantaneous rate of change. Second order derivatives. Methods of differentiation: differentiation of powers, function of functions, products, quotients, trigonometric, logarithmic and

exponential functions. Differentiation involving parameters. Application of differentiation: maximum, minimum and turning points, simple rates of change. Elements of integral calculus: standard integrals; differentiation reversed. Definite integrals; area under the curve involving standard integrals.

Probability/Statistics: Mean, Median and standard deviation. Calculating them using Excel. Graphical interpretation. Concentration around the mean (informal only – usually most data within 2-3 standard deviations of the mean)

Learning Outcomes

By the end of the module you should be able to:

- Understand accuracy and precision including significant figures, decimal places.
- Use Scientific Notation (for numbers) including its use in estimation.
- Apply the basic laws of arithmetic and algebra to a variety of problems.
- Solve simple problems involving indices and logarithms.
- Solve problems involving linear and quadratic equations.
- Solve a variety of problems involving straight lines, including angles and intersections.
- Apply trigonometric ratios to problems.
- Sketch the graphs of simple functions.
- Solve a wide variety of logarithmic, exponential equations.
- Deal with inequalities involving the modulus sign.
- Determine functions of functions and find the inverse of a function.
- Differentiate and integrate various types of functions.
- Apply differentiation to locate maxima and minima, and sketch simple polynomials.
- Evaluate definite integrals and calculate the area under a curve.
- Find the mean, median and standard deviation and understand how they describe a distribution.
- Manipulate vectors in 2 and 3 dimensions (coordinate definition only) including length, addition, subtraction, scalar multiplication and scalar (dot) product.

Assessment Details and Completion Requirements This module is assessed by coursework and a final examination. The coursework consists of three tests to be held during the two terms. The final examination is 3-hour duration.

Students must achieve an overall mark of at least 40% in order to pass this module.

Resits: students who fail the module at the first attempt are required to undertake a synoptic reassessment consisting of a 3-hour examination.

Recommended Textbooks

Maths: A Student's Survival Guide, A Self-Help Workbook for Science and Engineering Students, by Jenny Olive (Cambridge University Press, 2nd Edition February 2005) ISBN: 9780511074257. E-book is available. QMUL Library link.

Core Maths for Advanced Level, by L. Bostock & S. Chandler (3rd ed., published by Nelson Thornes, 2000) ISBN 978-1-4085-2228-8. No e-book available. QMUL Library link.

These textbooks will be useful for the extra exercises and extra practice, but it is not mandatory that each student obtains their own copy.

SEF041 Mathematics B

Module Organiser / Lecturer(s):	Dr Lubna Shaheen
Scheduled Classes:	Semester 1 and Semester 2 One 2-hour exercise lecture per week, one 1-hour tutorial class per week, one 1-hour optional (support) Q&A class per week and one 1-hour optional drop-in (office hours) per week.
Expected Background:	Recommended that students have Mathematics A-level C or equivalent.

Module Description & Aims

This module, in the first semester, covers mathematical topics such as algebra, functions, geometry and trigonometry, calculus. And in the second semester, provides students with a more extensive knowledge of calculus (especially in techniques of integration) and an introduction to complex numbers, numerical methods, vector analysis and power series.

The module aims to reinforce and extend the existing mathematical skills of those students taking it in Semester 1 so that they are prepared for more advanced mathematical topics to be covered in Semester 2. This module is appropriate for those students progressing onto degree programmes in mathematical sciences, and those degree programmes in physical science and engineering which require a more thorough and comprehensive grounding in mathematics.

Module Synopsis

Algebra: Review of theory of indices, logarithms, quadratic equations and quadratic functions, factorisation, logarithmic and exponential equations. Polynomials: the remainder and factor theorems, identical polynomials. Inequalities and equations involving the modulus sign. Equation of a straight line: various forms of equation of a line. Gradients, mid-points, distances, orthogonal lines.

Functions: The set-theoretical definition of a function; composite functions; inverse functions. The modulus of a function. Determination of the range or image set of a function. Odd and even functions; periodic functions, rational functions. Limits and asymptotes of functions. The algebraically defined exponential and logarithmic functions.

Trigonometry: Definition of the functions for an acute angle and extension to any angle. Graphical representation of the functions. Basic relationships between trigonometric functions. Inverse trigonometric functions. Compound angle, multiple- and half-angle formulas. Trigonometric identities. The solution of trigonometric equations and equations involving factor formulae over a restricted domain of the angle. Graphical and general solutions of trigonometric equations.

Calculus (differentiation): Fundamental elements of differential calculus; the derivative of a function, gradient at a point on a curve, the general gradient function, instantaneous rate of change. Second and higher order derivatives. Methods of differentiation: differentiation of powers, function of functions, products, quotients and trigonometric functions. Application of differentiation: equations of the tangent to a curve, maximum, minimum and turning points. Differentiation techniques for parametric and inverse trigonometric functions, implicit differentiation. Differentials: small increments and comparative rates of change.

Calculus (integration): Elements of integral calculus: standard integrals; differentiation reversed. Definite integrals; area under the curve involving standard integrals. Methods of integration: exponential and

logarithmic functions, trigonometric functions, integration by recognition, substitution, integration by parts. Change of variable. Determining areas of planar subsets

Integration by computer, both symbolic and numerical.

Understanding of what derivatives and integrals are, including Physical examples such as position, velocity and acceleration.

Numerical Methods: locating roots of equations - change of sign method; interval bisection method; the Newton–Raphson method.

Complex Number Theory: the algebra of complex numbers: Cartesian form; the modulus and argument of a complex number; the modulus-argument form; polar form; conjugate complex numbers. Graphical representation of complex numbers; the Argand plane, the vector association. Representation of addition, subtraction, multiplication and division.

Sequences and Series: Binomial theorem and applications. Summation of finite series; the method of difference for polynomial terms; the natural number series; The expansion of a function: Maclaurin's series; the expansions of the logarithmic, exponential and trigonometric functions. Applications of power series expansions. Approximations.

Vectors: 2 and 3 dimensional vectors. Vector algebra: basic concepts; angle between two vectors; multiplication and division of a vector by a real number. Scalar and vector product of vectors. Position vectors; position vector of a point; resolution of a vector in two and three dimensions. Equation of a line and a plane in three dimensions.

Learning Outcomes

By the end of the module, you should be able to:

- Solve a wide variety of logarithmic, exponential, quadratic, polynomial and trigonometric equations.
- Solve simple problems in three-dimensional coordinate geometry including using vectors.
- Apply the remainder and factor theorems to polynomials.
- Deal with inequalities and equations involving the modulus sign.
- Determine functions of functions and find the inverse of a function.
- Differentiate and integrate a wide range of functions including using a computer
- Apply differentiation to locate maxima and minima, and sketch simple polynomials.
- Solve problems involving simple rates of change.
- Evaluate definite integrals, calculate the area under a curve and the volume or surface of revolution.
- Represent and manipulate complex numbers in various forms.
- Solve problems involving comparative rates of change.
- Find roots of equations using numerical approximation.
- Solve problems involving finite, infinite and power series.

Assessment Details and Completion Requirements

This module is assessed by coursework and a final examination. The coursework will consist of 3 tests to be held during the two terms. The final examination is of 3-hour duration.

Students must achieve an overall mark of at least 40% in order to pass this module.

Resits: students who fail the module at the first attempt are required to undertake a synoptic reassessment consisting of a 3-hour examination.

Recommended Textbooks

Maths: A Student's Survival Guide, A Self-Help Workbook for Science and Engineering Students, by Jenny Olive (Cambridge University Press, 2nd Edition February 2005) ISBN: 9780511074257. E-book is available. QMUL Library link.

Core Maths for Advanced Level, by L. Bostock & S. Chandler (3rd ed., published by Nelson Thornes, 2000) ISBN 978-1-4085-2228-8. No e-book available. QMUL Library link.

These textbooks will be useful for the extra exercises and extra practice, but it is not mandatory that each student obtains their own copy.

SEF042 Science and Engineering Success

Module Organiser / Lecturer(s): Dr Giorgio Chianello

Scheduled Classes: Semester 1 and Semester 2
One 2-hour lecture on alternate weeks, three 1-hour Advisorials and practical labs sessions.

Module Description & Aims

This module will showcase fundamental tools to help students in their studies and to navigate the job market. The module will also provide hands on experience in common STEM laboratory technique to equip them with necessary skills useful in their progression in to Bachelors, Masters and beyond. In addition, students will be exposed to basics of computer science/ programming to better prepare them for their future undergraduate studies.

Module Synopsis

- Knowledge and practice of basics of computer science.
- Exposure to various study techniques to support identification of best approach.
- Recognition and application of skills required to apply for jobs in STEM and beyond.
- Knowledge and practice of various basic STEM laboratory techniques.
- AI and its impact on the education system.
- The role of computation in STEM disciplines.

Learning Outcomes

By the end of the module you should be able to:

- Operate and appreciate the applications of several common laboratory instruments
- Navigate the job market to identify opportunities available
- Operate common software used in STEM disciplines
- Propose simple algorithmic solutions to computational problems using computational thinking tools such as decomposition, abstraction, and pattern recognition
- Perform task as part of a group and successfully navigate the team environment

Assessment Details and Completion Requirements

- Advisor Task 1 – 12%
- Advisor Task 2 – 12%
- Computer Exercise – 26%
- Lab Assessment Quiz – 50%

Resits: students who fail the module at the first attempt are required to undertake a synoptic reassessment examination.

SEF043 Foundations of Chemical Science

Module Organiser / Lecturer(s): Dr Marc Fernandez-Yague

Scheduled Classes: Semester 1 and Semester 2
One 2-hour lecture on alternate weeks, One 1-hour Support and Feedback Session on alternate weeks.

Module Description & Aims

This module will provide fundamental understanding of principles and concepts in chemistry to equip students with necessary tools to become a successful undergraduate student. The module will also showcase some of the many applications of chemistry in the real world to inspire new generation of scientists.

Module Synopsis

- Introduction to atomic structure: electrons, protons and neutrons, mass and atomic numbers, isotopes
- The electronic structure of atoms: Bohr's model of the atom, quantum numbers and introduction to the concept of orbitals and orbital shape, electron configurations, Aufbau principle, Hund's rule and the Pauli exclusion principle, valence and core electrons.
- Stoichiometry and concentrations: empirical and molecular formulae, balancing chemical equations, the concept of moles and molarity.
- Chemical bonding: ionic, metallic and covalent bonding, polarisation of bonds, bond strengths and lengths.
- Properties of gases, liquids and solids: Interatomic and intermolecular forces and the ideal gas law.
- Introduction to organic chemistry: identification of functional groups and classes of organic compounds, organic nomenclature, the hybridisation approach to rationalising bonding and isomerism.
- Acids and bases: Brønsted–Lowry theory of acids and bases, strong and weak acids, acid-base pairs, pH and pKa, buffers solutions, Lewis acids and bases
- Revision of some basic topics: units, significant figures; moles, molarities and dilutions.
- Chemical equilibria: equilibria as a dynamic phenomenon, definition of Kc and Kp, calculation of equilibrium concentrations, Le Chatelier's principle, relation between free energy changes and the equilibrium constant.
- Organic chemistry: specific examples of the structure and reactivity of selected organic compounds

Learning Outcomes

By the end of the module, you should be able to:

- Identify the atomic and electronic structure of elements and various classes of simple organic compounds. As well as Identify isomers of compounds, and name representative molecules from such classes of compounds.
- Discuss the reactivity of a range of organic compounds, including alkenes, halogenated alkanes, aromatic and carbonyl compounds.
- Describe the nature of equilibrium in a chemical context and the factors that influence the position of equilibrium.
- Balance chemical equations and perform calculations relating mass, concentration and molar quantity.

Assessment Details and Completion Requirements

- Mastering Chemistry 1 – 25%
- Mastering Chemistry 2 – 25%

- Test 1 – 25%
- Final Exam – 25%
  Resits: students who fail the module at the first attempt are required to undertake a synoptic reassessment examination.

Recommended Reading

Chemistry: The Central Science (14th edition in SI units), T.E. Brown, H.E. LeMay, B.E. Bursten, C. Murphy, P. Woodward, Pearson, Harlow, 2018, ISBN 1292221224 or 9781292221229

SEF044 Foundations of Physical Science

Module Organiser / Lecturer(s): Prof David Dunstan / Dr Andrei Sapelkin

Scheduled Classes: Semester 1 and Semester 2
One 2-hour lecture on alternate weeks, One 2-hour Exercise Class on alternate weeks.

Module Description & Aims

Students will be equipped with sufficient physics general knowledge and skills to be successful first year Physics undergraduates. It provides fundamental understanding of principles and concepts in physics, supplying students with the necessary tools to become successful undergraduate students. The module will also showcase the elegance and beauty in physics, as well as several applications in the real world in order to inspire new generation of scientists.

The module begins with basic physical concepts, such as Units, Physical Quantities, and Vectors; Kinematics in one, two and three dimensions; Momentum, work, energy and Newton's laws, with extension to rotational motion. Equilibrium and elasticity are defined and basic concepts of matter and phases.

The concept of fields in physics is introduced and its relationship to forces and potentials on examples of gravity and electrostatics. Wave motion is then defined and corresponding maths and examples in sound and light.

Circuit theory and solutions, are introduced, including meters (examples include comparing hydraulics, battery-resistor networks, people flow through stations, etc.). Finally, Basic Quantum Mechanics is introduced using the Feynman approach as well as Relativity from Einstein's train to black holes and basic Cosmology.

Module Synopsis

- Correct use of Units, Physical Quantities, and Vectors
- Basic applications of kinematics, momentum, work, energy and Newton's Laws
- Extend translational mechanics to rotational motion
- Use equilibrium and elasticity
- Understand the basic constituents of matter and simple phase changes
- Apply the concept of fields in Physics
- Define and apply wave motion
- Apply circuit theory to simple problems
- Acquaintance with the basic concepts of quantum mechanics
- Acquaintance with the basic concepts of special relativity and cosmology

Learning Outcomes

By the end of the module, you should be able to:

- Use basic concepts in Newtonian mechanics
- Explain basic concepts involving energy, forces and motion
- Describe and account for the different states of matter
- Describe and apply the concept of a field to a range of natural phenomena.
- Describe and apply the theory of waves to a range of natural phenomena.
- Describe the behaviour of electrons
- Explain the basic ideas of quantum physics and relativity

Assessment Details and Completion Requirements

- Test 1 – 25%
- Test 2 – 25%
- Test 3 – 25%
- Exam – 25%

Resits: students who fail the module at the first attempt are required to undertake a synoptic reassessment examination.

Recommended Reading

OpenStax, College Physics 2e, Paul P. Urone and Roger Hinrichs, available for free online at https://openstax.org/details/books/college-physics-2e.

Sears and Zemansky's College Physics, Hugh D. Young, any edition should be a good reference.

New understanding physics for Advanced Level, Jim Breithaupt, 2000, Stanley Thornes Publisher, Cheltenham, 4th ed, ISBN-10 0748743146, ISBN-13 9780748743148

SEF045 Foundations of Biological Science

Module Organiser / Lecturer(s): Dr Kashaf Junaid / Dr Gabriel Sutton

Scheduled Classes: Semester 1 and Semester 2
One 90-minute lecture on alternate weeks, one 2-hour Workshop on alternate weeks, two lab practicals

Module Description & Aims

This module will introduce you to the basic principles of the biological sciences. Through this module you will explore key themes that underpin many aspects of biology such as genetics, disease, cells, and whole organism biology. This will be done through interactive hands-on learning as well as practical classes. This module is suitable for those going on to study; Biology, Zoology, Medical Genetics or Biomedical Sciences.

This module aims to give students a broad but detailed foundation in the biological sciences. To do this, a thematic approach will be applied, whereby students will learn different facets of biological sciences within a prescribed framework or case study. This approach aims to equip students with a broad range of knowledge and skills. Students will learn about key genetic principles by studying how they relate to disease and heredity. Similarly, this module aims to demonstrate to students how cells, the mechanisms of life processes and organisms as a whole are connected through the key principles of evolution. Finally, this module aims to equip students with practical skills and an understanding of a variety of experimental techniques.

Module Synopsis

- The structure and function of a cell as well as the mechanisms for life processes.
- The structure, diversity and reproduction of key organisms.
- Explain how the principles of genetics and cell division underlie some key conditions.
- Basic genetic principles relating to evolution of the organisms studied.
- Identify a range of appropriate and relevant experimental techniques and how they are used.

Learning Outcomes

By the end of the module, you should be able to:

- Reason Critically.
- Apply biological knowledge and principles, in combination with problem-solving skills, in a wide range of theoretical and practical situations.
- Use advanced theories and concepts to explain/rationalize biological phenomena, and to investigate unfamiliar problems.
- Identify and Formulate problems.
- Conduct practical work efficiently and with due regard for safety.
- Retrieve, filter and collate biological data from a variety of information sources.

Assessment Details and Completion Requirements

- Essay – 25%
- Test 1 -25%
- Test 2 – 25%
- Exam – 25%

Resits: students who fail the module at the first attempt are required to undertake a synoptic reassessment examination.

Recommended Reading

Mader, S. (1997). Inquiry into life. 15th ed. Dubuque, Iowa: W.C. Brown

Sadava, D., Hillis, D.M., Heller, H., and Berenbaum, M. (2014). Life: the science of biology, 12th ed. Sunderland, MA: Sinauer.

SEF046 Foundations of Engineering

Module Organiser / Lecturer(s): Dr Raza Shah

Scheduled Classes: Semester 1 and Semester 2
One 2-hour lecture on alternate weeks, One 2-hour Exercise Class on alternate weeks.

Module Description & Aims

The module provides an introduction to engineering through the application of scientific principles to solve practical engineering problems. It includes discussions on applications in the engineering field and the standardisation of units through key engineering principles, engineering calculations, mechanical applications, material behaviour and stress analysis. Key engineering topics will be covered, such as, forces and static systems; equilibrant forces and maintaining equilibrium; stress-strain behaviour of materials; structures under load and structural design; tensile, compressive and shear forces; bending stresses in beams; power transmission systems; internal combustion engines (I.C.).

This module aims to introduce students to the application of scientific principles by combining theory and calculation methods with practical applications to solve practical engineering design problems. The module provides knowledge and an understanding of the fundamental engineering principles and their applications e.g., systems in equilibrium and forces, stress-strain behaviour of materials under load, structural design shear forces, bending stresses, power transmission systems and internal combustion engines (I.C.).

Module Synopsis

• Simplifying mechanical systems using free-body diagrams and understanding the use of assumptions when solving mechanical problems for systems in disequilibrium and when maintaining static equilibrium e.g., frictionless and zero mass conditions.

• Structural design of beams and joint-member structures. Beam design and structural design (joints and members).

• Linear and rotational motion for simple mechanical transmission systems (e.g., pulleys and gears) and for reciprocating internal combustion engines (RICE).

• Determine shearing forces and bending moments for beams under load e.g., shearing force and bending moment diagrams for simple beam systems under different; 2nd moments of area for simple; parallel axis theorem; composite beam sections for different beam section profiles.

• Knowledge of fundamental mechanical properties of engineering materials, e.g., stress versus strain characteristics and the modulus of elasticity. An understanding of the implications of stress, strain, strength and stiffness for material selection in engineering design and factors of safety in design.

• Reciprocating I.C. Engines: The 4-stroke versus 2-stroke cycles and design and performance considerations for construction, assembly, operation and developed power. Understanding simplified indicated power. diagrams, compression ratios and pressure versus volume cycle diagrams and indicated power calculations.

Learning Outcomes

By the end of the module, you should be able to:

- Solve foundation level engineering problems relating to mechanical applications for static systems, structures under load and systems involving simple linear and rotational motion.

- Solve foundation level engineering problems relating to forces, stresses and strains in materials, beams and simple structures.
- Solve fundamental internal combustion engine problems for determining power, engine capacity, compression ratios, swept volumes and clearance volumes.
- Develop an ability to critically analyse and evaluate engineering problems.
- Apply engineering principles and formulae in engineering calculations to solve engineering problems.

Assessment Details and Completion Requirements

- Test 1 – 25%
- Test 2 – 25%
- Test 3 – 25%
- Exam – 25%

Resits: students who fail the module at the first attempt are required to undertake a synoptic reassessment examination.

Recommended Reading

Mechanical Engineering Science, by J. Hannah and M.J. Hillier (3rd edition, published by Prentice Hall, 1999).

SEF047 Further Mathematics

Module Organiser / Lecturer(s): Prof Alexander Marynych

Scheduled Classes: Semester 2
One 2-hour lecture and one Exercise Class each week.

Module Description & Aims

This module introduces students to arithmetic beyond the integers and rational numbers: modulo arithmetic, and the arithmetic of polynomials, and matrics. Applications of these concepts in probabilty, logic and relational algebra will also be covered.

This module aims to build upon the content of Maths B to provide a solid mathematical foundation, both of knowledge, methods, and ways of thinking, to be successful in a degree in the Mathematical Sciences, or STEM subjects more broadly.

Module Synopsis

- Polynomial Modular and arithmetic: addition, multiplication, the laws of arithmetic; rational polynomials, polynomial division and partial fractions; powers of binomials using Pascal's Triangle. Modular arithmetic.
- Introduction to Logic: Statements, And, Or and negation. Implies. Quantifiers (`for all' and `there exists') including negations. Converse and proof by contradiction.
- Naive Set Theory: sets; set operations including union and intersection; laws of set arithmetic including De Morgan's laws, Venn diagrams and applications to counting problems;
- Probability: Basic ideas, binomial distribution. Poisson distribution. Simple applications and examples. Continuous distribution including the normal distribution.
- Matrices: definition, sum and product, determinants and inverses (2x2 only), examples in two dimensions including rotations reflections and dilations.
- Relations and mappings: Cartesian product of sets; relations and their properties: symmetry, reflexivity and transitivity; equivalence relations and partially ordered sets; mappings and their properties; injectivity, surjectivity and bijectivity; functions and inverse functions.

Learning Outcomes

- carry out arithmetic on polynomials. modular arithmetic, and matrix arithmetic.
- understand, combine and manipulate simple mathematical logic statements, including quantifiers.
- understand and apply ideas of probability.
- understand matrices as mappings of two-dimensional space.
- understand the ideas of sets.
- be able to manipulate and describe functions.

Assessment Details and Completion Requirements

- In-person Test 1 – 25%
- In-person Test 2 – 25%
- Exam – 50%

Resits: students who fail the module at the first attempt are required to undertake a synoptic reassessment examination.

Recommended Reading

Discrete Mathematics by S. Lipschutz & M. Lipson (Schaum's Outline Series; published by McGraw-Hill, 1997) (Note that this book contains much more material than is required for this course.)

5.4. Marking Criteria, Grading and Feedback

Marks and grades for individual modules

In order to pass an individual module, you must achieve an overall mark of **40% or above**, and meet any additional requirements specified in the module description.

How the overall mark for a module is calculated?

The module mark is normally calculated (to a precision of 1 decimal place) by taking a weighted average of the overall coursework mark and the mark achieved in the final examination. The relative contributions of coursework and examination to the aggregate mark depend on the module; these proportions are given in the module descriptions.

The overall coursework mark is itself calculated from the percentage marks obtained in the individual assessments completed as part of the coursework for the module. These assessments will typically have different weightings, as indicated in information provided at the beginning of the module.

Grading of your Final Marks

For each module, in addition to the percentage mark, you will receive a letter-grade. These are assigned as described below:

Mark	Grade	
70.0% or above	A	Pass
60.0-69.9%	B	Pass
50.0-59.9%	C	Pass
45.0-49.9%	D	Pass
40.0-44.9%	E	Pass
39.9% or below	F	Fail

Thus, your final mark in a particular module might be given, for example, as 47.2 (D) or 81.8 (A).

Publication of Marks

Most items of marked coursework should be returned to you on an individual basis and your recorded marks will be available to you via QMplus, with provisional and confirmed assessment marks published on MySIS after the Exam Board period. Guides on checking your results on MySIS are available on the Student Enquiry website: http://www.arcs.qmul.ac.uk/students/mysis-record/provisional-results/index.html.

Feedback on your Coursework

Feedback may be available for coursework assessments, depending on the module and type of assessment. It will usually be available through QMplus where you submit your assessment.

- Feedback may be delivered in various forms according to the structure of the module.
- Feedback during lecture and revision session may be given through whole class feedback, group feedback or individual feedback on tasks/mock answers.
- Feedback during tutorials may be provided in relation to individual or group responses to particular topics

It is expected that students will contribute during the session either in groups or individually as instructed by the lecturer. The onus is on students to ensure they actively participate in the sessions. If a student requires further feedback they should contact the module convenor.

5.5. Examination Feedback

Provisional exam results are returned to you within two weeks of the Exam Board via MySIS. Once you receive your exam results, if you have any questions, you should contact the Foundation team in the first instance. If you would like feedback about your exam result, you can contact the Module Organiser directly.

Confirmed examination results are released once they have been approved by the Subject Examination Board, normally in July for Summer examinations, and in September for the late summer/resit examinations.

Failed Modules and Resits

To pass a module, you need an overall module mark of at least 40%. So, it is possible to fail an exam but still pass the module overall if you have a high score for the coursework. If you have passed a module, you can't sit the exam again, for example to get a better mark.

If you fail a module at the first attempt, you are entitled to one resit opportunity. You will **automatically be registered** for the next available resit opportunity, which will be in August. If you don't resit the module then, you won't get another chance at a later date. The only exception is if you have accepted extenuating circumstances.

When you resit a module, you are normally required to undertake a "synoptic" reassessment. This means your final overall module mark, is dependent entirely upon your performance in the resit exam, without consideration of any coursework marks. **All resits are capped at 40,** which means this is the highest mark you can get.

The examination timetable is normally published in July, and you will be able to access this on MySIS. For any modules which are not reassessed with an examination, you will receive instructions via email and on QMplus.

More detailed information on re-sit examinations and missing exams etc can be found here, http://www.arcs.qmul.ac.uk/students/exams/index.html.

Section 6: Writing and Assessment

6.1. Assessment Types

The Foundation modules are assessed with:

- One or more coursework components that count for 20-30% of the overall module mark
- An examination which counts for the remainder of your module mark

Coursework is an assessment that takes place during the module. This could include in-class tests, presentations, essays, reports, quizzes on QMplus, homework, etc.

Engaging with coursework will give you an understanding of your progress with the module and you will receive constructive feedback that will help improve your performance further. You will also be exposed to various types of coursework to help you develop a range of transferrable skills such as presentation skills, writing skills, time management skills, project management skills and research skills.

At the start of each semester make sure you have a clear understanding of each module's coursework so that you can organise your schedule. Examinations are formal, timed and invigilated assessments, that take place during the May and September examination periods.

6.2. Plagiarism and Referencing

Queen Mary defines plagiarism as:

> "*Presenting someone else's work as your own, irrespective of intention. Close paraphrasing, copying from the work of another person, including another student, using the ideas of another person without proper acknowledgement or repeating work you have previously submitted – at Queen Mary or at another institution - without properly referencing yourself (known as 'self-plagiarism') also constitutes plagiarism.*"

The above Queen Mary definition is taken from the **Academic Misconduct Policy**
https://arcs.qmul.ac.uk/students/student-appeals/academic-misconduct/

Plagiarism is a **serious offence**, and all students suspected of plagiarism will be subject to an investigation, in the first instance. If found guilty, penalties can include failure of the module to suspension or permanent withdrawal from Queen Mary.

It is **your responsibility** to ensure that you understand plagiarism and how to avoid it. The recommendations below can help you in avoiding plagiarism:

- Be sure to record your sources when taking notes, and to cite these if you use ideas or, especially, quotations from the original source. Be particularly careful if you are cutting and pasting information between two documents and ensure that references are not lost in the process.
- Be sensible in referencing ideas – commonly held views that are generally accepted do not always require acknowledgment to particular sources. However, it is best to be safe to avoid plagiarism.
- Be particularly careful with quotations and paraphrasing. Quotations need to be recorded accurately, and references are required when paraphrasing someone else's ideas.
- Be aware that technology, such as Turnitin, is now available at Queen Mary and elsewhere that can automatically identify possible plagiarism.
- Ensure that all works used are referenced appropriately in the text of your work and fully credited in

your bibliography.
- If in doubt, ask for further guidance from your Advisor or Module Organiser.
- There is an Academic Integrity course to assist you in understanding and avoiding plagiarism. For more details, please visit Online study resources - Library Services (qmul.ac.uk)

As previously noted, you must also avoid self-plagiarism by failing to reference your own work that you have already used in a previous essay or commit plagiarism by failing to credit the input of other students on collaborative work/group projects. If you are in any doubt, ask for further guidance from your Advisor or Module Organiser.

Further resources and guidance can also be accessed via the Library Services referencing hub at: https://www.qmul.ac.uk/library/academic-skills/referencing-hub/.

6.3. Turnitin

Introduction

Turnitin is a web-based system used by most universities in the UK to identify possible instances of plagiarism. This statement describes how Turnitin is used within the Schools and the data it creates about your work.

1 How Turnitin works

1.1 A Turnitin assignment is set up by a member of staff, either on QMplus or directly on Turnitin's own website (https://www.turnitinuk.com). You then access this assignment online and upload your work before the due date. Turnitin will analyse the submitted work to identify text matches with other sources and will compare the work against:
- the current and archived web;
- previously submitted work;
- books and journals.

1.2 For each piece of submitted work Turnitin provides two things:
- A **similarity index**, which indicates the percentage of the submitted paper that Turnitin has identified as matching other sources.
- An **originality report,** which shows each of these matches in more detail, including the source(s) that Turnitin has found.

2 How Turnitin is used

2.1 Turnitin is used on the majority of foundation coursework assignments that contribute towards your final grade. Turnitin will not normally be used on the following assignments:
- short assignments (under 500 words)
- contributions to online discussions
- exercises submitted on paper
- exams
- computer programs

2.2 For those assignments where Turnitin is used, all submissions to that assignment will be submitted to Turnitin.

2.3 How we use the information provided by Turnitin

2.3.1 Only academic staff will make a judgement on whether plagiarism has occurred in a piece of work. An academic may interpret the originality report to help but Turnitin itself does not make this judgement.

2.3.2 We do not use a threshold percentage to identify whether plagiarism has occurred and may review any originality report in detail.

2.3.3 Turnitin will highlight matching text such as references, quotations, common phrases and data tables within work that has no plagiarism issues at all. Those interpreting Turnitin reports will discount such matches, and so initial percentages are often irrelevant.

2.3.4 Where it is suspected that plagiarism has occurred in a piece of work, the originality report may be submitted to the Head of School/Institute and possibly to an Academic Misconduct Panel for further investigation.

2.4 How you can use the information provided by Turnitin

2.4.1 There will be an opportunity for you to see a Turnitin report on your work before Turnitin is used on your assessed work.

2.4.2 No other student will be able to see an originality report on your work.

2.4.3 To help you understand what the report is telling you, please ensure you have followed the guidance on the E-Learning Unit's website (http://www.elearning.capd.qmul.ac.uk/guide/interpreting-your-originality-report/).

2.4.4 You may find it helpful to resubmit your work after reviewing the originality report and you will generally be given one opportunity to do this. Where this is the case, the idea is to use the report to help you identify any potential issues you may not have spotted before, and not to change individual words to avoid a match.

2.4.5 If you have a question about your originality report that is not answered by the material linked to in 2.4.3 above, please direct these to your module convenor in the first instance.

2.5 Other things you should know

2.5.1 Turnitin stores a copy of most work submitted to it in its repository. This does not affect the ownership of or any copyright in the original work.

2.5.2 Staff may configure a Turnitin assignment such that copies of submissions are not stored in its database. This will be done for all test-runs or any 'dummy' assignments used for training or demonstration purposes.

2.5.3 Staff on your course will ensure that no commercially or otherwise sensitive documents are stored in Turnitin's repository.

2.5.4 You cannot opt out of having your work scanned by Turnitin, but if you believe that your work should be deleted after it is scanned you should contact your lecturer.

Instances of plagiarism/copying/cheating will be noted in your student file and repeated offences of this nature, or a single serious offence on a major piece of coursework, will result in your case being referred to Queen Mary's Academic Misconduct Panel. This may result in you failing the whole module or being de-registered from the programme.

Section 7 Student Services

7.1. Bursaries, Grants and Scholarships

Student Loans

If you have applied for funds from Student Finance, then you will receive the first instalment once you have enrolled fully for the academic year. If your payments do not arrive and you cannot remedy the problem with Student Finance yourself, please contact the Student Enquiry Centre, *http://www.arcs.qmul.ac.uk/students/sec/* . They will be able to determine any actions needed by Queen Mary and advise you of the next steps.

Bursaries

Queen Mary Bursaries are assessed using the household income information provided to us from Student Finance.

If you do not wish to take out student funding, such as loans, but still wish to be assessed for a Queen Mary Bursary you will still need to apply for a household income assessment, full details on how to do this are on our website - *www.arcs.qmul.ac.uk/QMULBursary*

Full details of the Queen Mary Bursary, including eligibility, amounts and payment dates can be found on our website - *www.arcs.qmul.ac.uk/QMULBursary*

Queen Mary Financial Assistance Fund

If you have exceptional or unforeseen costs, or you are in financial hardship, you could be eligible for help from the Financial Assistance Fund. The fund is there to help any eligible student who has a particular financial need, but we cannot meet every application we receive and we cannot always meet all of the costs that you might apply for.

Contact

Log an enquiry via your MySIS portal for the Bursaries, Grants and Scholarships Office

Email: bursaries@qmul.ac.uk

www.arcs.qmul.ac.uk/bursariesoffice

Queen Mary Short Term Loan

Short term loans of up to £350 are available to students who have experienced a delay in their Maintenance Loan being paid by the Student Loans Company.

Details of how to apply can be found at https://arcs.qmul.ac.uk/students/finances/bursaries-grants-scholarships/qmul-emloans/

7.2. The Online Student Handbook

The online student handbook is designed to help you easily find information on the University facilities, services, policies and more! From information on student services (including the Advice and Counselling Service and Library) to details on the Regulations and relevant policies.

To access the handbook, please visit: https://www.qmul.ac.uk/student-handbook/