Mechatronics
BEng/MEng
Pre-entry pack
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Programme Structure

MEng and BEng programmes follow the same curriculum up to the end of third year. Students must attain a GPA of at least 14.0, at the end of year 3, in order to progress onto the MEng. Students who fail to attain this level may only be permitted to study for the BEng.

Please note: The curriculum as outlined may be subject to change prior to the start of the programme. Full course descriptors can be found at: www.gla.ac.uk/coursecatalogue

Year 1
- Analogue Electronics 1
- Design and Manufacture 1
- Engineering Skills 1
- Materials 1
- Dynamics 1
- Engineering Mathematics 1
- Microelectronic Systems 1
- Statics 1
- Thermodynamics 1

Year 2
- Analogue Electronics 2
- Mechanical Design 2
- Electrical Circuits 2
- Electronic Design Project 2
- Embedded Processors 2
- Power Electronics 2
- Mechanics of Structures 2A
- Introductory Programming 2
- Dynamics 2
- Fluid Mechanics 2
- Engineering Mathematics 2

Year 3
- Software Engineering M3
- Dynamics and Control M3
- Electromagnetic Compatibility 3
- Electronic System Design 3
- Instrumentation and Data Systems 3
- Simulation of Engineering Systems 3
- Mechanics of Solids 3
- Real Time Computer Systems 3
- Mechatronic Team Project 3
- Finite Element Analysis 4

Options
- Reliability Engineering 3
- Power Engineering 3

Year 4 BEng
- Control 4
- Digital Signal Processing 4
- Individual Project 4
- Robotics 4
- Autonomous Vehicle Guidance Systems 4
- Professional Practice 5

Year 4 MEng
- Control 4
- Digital Signal Processing 4
- Integrated System Design Project 4
- Robotics 4
- Mechatronic Team Project 4

Options
- Lasers and Electro-Optic Systems M4
- Materials Engineering M4
- Power Systems 4
- Vibration M4
- Autonomous Vehicle Guidance Systems 4
- Power Electronics and Drives 4
- Elements of Law for Engineers

Year 5
- Robust Control 5
- Autonomous Vehicle Guidance Systems 10
- Fault Detection, Isolation and Reconfiguration
- Individual Project 5
- Dynamics M5
- Professional Practice 5

Options
- Reliability Engineering 3
- Power Engineering 3
Timetable
Sample timetables show an average schedule. You will have lectures every day probably, between 2 and 4 hours per day. In addition you will have laboratories or tutorials which allow you to develop what you have learnt in the lectures. The number of laboratory sessions or tutorials you have over the term will depend on the subject, but in the first year there will typically be 1-2 laboratories and 2-3 tutorials per week and these will all start in the third week of term.

A definitive copy of your timetable will be available on MyCampus, once you have registered. You should check this regularly as updates will be made.

www.gla.ac.uk/students/myglasgow/

Please note that you are expected to do several hours of independent study per week, for each subject, throughout the term. In fact studying engineering is like a full time job, you'll require good time management to balance study and other commitments.

Most teaching is done in 50 minute lectures and each lecturer will present in their own style. Most will give handouts or make notes available online but you will be expected to take notes during the lecture.

Online you will find extracts from first year lectures – they are only a tiny part of a large course and can only give you an approximate idea of content and level. They have been taken from part way through the course so some concepts may be used which were explained earlier in the course, and you're not expected to understand it before you arrive.

Reading List
Due to the nature of the programme we don't provide a specific reading list. Where appropriate your lecturer will issue a list at the start of teaching.
Study in groups, you’ll be surprised at how much you can learn by bouncing ideas of your colleagues

Mark Doyle
Aeronautical Eng
MEng Graduate

Mathematics Revision

Here are a few exercises to help you to revise your mathematics before you come to university. All of the techniques should have been covered in Higher Mathematics but the questions are dressed up in the language of engineering, which may make them a lot more challenging! However, they will provide a good introduction to studying at university. The examples are from electronics because you may have encountered some of the material in Physics at school. You will see plenty of applications to your discipline when you arrive here.

Please don’t get the idea that the curriculum is dominated by mathematics: it is definitely engineering. However, professional engineers use mathematics as a tool to help them solve problems, which means that you must be able to do basic calculations quickly and reliably – almost automatically. You won’t be able to concentrate on the engineering if it takes you half an hour to solve a quadratic equation, for instance. We will help you to develop this skill during the first year, this is allow you to develop the skills that you use in later years, the amount of formal mathematics teaching drops through the years as you use these skills. It will be a challenge but very profitable for your future career. I have included numerical answers to some of the questions. Full solutions are available on the School of Engineering’s web site at www.gla.ac.uk/engineering/infopacks. Please don’t look at these until you have tried the exercises yourself.

So while you will do a significant amount of Mathematics in the first year, this is allow you to develop the skills that you use in later years, the amount of formal mathematics teaching drops through the years as you use these skills. It will be a challenge but very profitable for your future career. I have included numerical answers to some of the questions. Full solutions and more questions are available with the info packs online. Please don’t look at these until you have tried the exercises yourself.

1. Figure 1(a) shows a widely used circuit called a **potential divider** formed by two resistors. The input and output voltages are given in terms of the resistances by

   \[ V_{\text{out}} = \frac{R_2}{R_1 + R_2} V_{\text{in}}. \]

   Use this to find the unknown quantities in figures 1(b)-(e). [0.5 V, 50Ω, 12 V, 16 kΩ]

   ![Figure 1: A selection of potential dividers.](image)

2. A remote control draws 10 mA while it is being used and 10 µA when it is idle. (Make sure that you know the powers of 10 for the prefixes in mA and µA. How about kA and nA?) What is the average current drawn, assuming that it is used for 5 minutes per day? Which is more significant, the current drawn when it is operating or idle? [45 µA]

   The control’s batteries are rated at 100 mAh. This means that the product of the current in mA and lifetime in hours is 100. For example, they will provide 100 mA for 1 hour or 0.1 mA for 1000 hours. How long will they last in the remote control? [About 3 months]

   ![Figure 2: The classic inverting and non-inverting amplifier circuits.](image)
The purpose of this short note is to make you aware of the Undergraduate Advising System we have in the School which is available to support you in your studies. As soon as you register with us you will be allocated an Adviser of Studies. You can easily find out who this is by logging in to your MyCampus account.

I should make it clear that your adviser is not a tutor – he/she will not be able to help you with problems relating to your course material (you should contact the course lecturer for this). Your adviser of studies is there to help you with any other problems you might experience which affects your ability to study. They will also help you with issues relating to academic progress, curriculum choices and career matters.

During the first two weeks of the semester you will be contacted by your adviser and invited to meet him/her. This is simply to give you a chance to meet your adviser for the first time, and should only take a few minutes – please attend this meeting.

Our intention is that you should keep the same adviser throughout your degree study and he/she will be able to provide you with reference letters and recommendations when you come to apply for a placement, internship or a permanent job after graduation.

During the semester if you should have problems, medical or personal, for example, you can ask for an appointment to see your adviser (usually by e-mail). If your adviser can’t help you directly, the University has many central student support services (counselling, financial advice chaplaincy etc) and your adviser will point you to the correct service to help you. Anything you tell your adviser will be held in the strictest confidence.

If you miss any classes (say due to illness) please report them using the Student Absence system on MyCampus. If during the exam period you are ill and this causes you to miss an exam or you feel your performance has been affected, please use the Good Cause reporting system on MyCampus.

Advisers are also busy academics and may have commitments with teaching and research or may indeed be off-campus for periods of time. If you cannot contact your adviser of studies please contact the Teaching Office (see contact details opposite) who will direct you to the Senior Adviser for your discipline.
ENGINEERING SOCIETIES

At the school of Engineering, we strongly encourage student-led activity wherever possible. This past year alone we have seen the launch of three new student-led initiatives. Below is a list of our current engineering student associations. Don’t be discouraged if you feel that there is a gap – it’s an opportunity to start your own…

• Design, Build, Fly
• EWB (Engineers Without Borders)
• FEMEng (Female Engineering Society)
• Formula Student (Racing Car Construction)
• GUBMES (Glasgow University Biomedical Engineering Society)
• GUES (Glasgow University Engineering Society)
• GUieee (IEEE Student Branch)
• GURobotics
• iGEM (Synthetic Biology)
• JetX (Jet Engine Enthusiasts)

For more information visit:
www.gla.ac.uk/engsoc

Formula Student

Each year Formula Student (FS) challenges university students from around the world to design and build their own single-seat racing car, which is then put to the test at the famous Silverstone Circuit. University teams from multiple disciplines work together, developing creative solutions, building teamwork and communication skills, and learning how to deliver projects to budget and deadlines.

63 Engineers
20 Hours a week
12 Months
1 Car

For more information or details about how to get involved contact:
Email: contact@ugracing.co.uk
Facebook: fb.me/UGRacingFSAE
Twitter: UGRacing_fsae
The Mechatronics Induction Event
Wednesday 13th September

10:00 - 11:30 Welcome Session, Sir Charles Wilson Building
11:30 - 11:45 Lunch, Sir Charles Wilson Building
11:45 - 14:00 Ice-breaker session, James Watt South Building

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