



University
of Glasgow

James Watt
School of
Engineering

Mechanical Design Engineering MEng/BEng Pre-entry pack

gla.ac.uk/schools/engineering

**WORLD
CHANGING
GLASGOW**

INTRODUCING THE JAMES WATT SCHOOL OF ENGINEERING

1736

Born in Greenock, Watt was home schooled before attending Greenock Grammar School.

1759

Watt Began his life-long interest in steam-power under the influence of his friend John Robinson.

1765

Famously while strolling on Glasgow Green, Watt devised a separate condenser which would improve efficiency and permit enormous savings in fuel.

1784

Elected fellow Royal Society of Edinburgh

1756

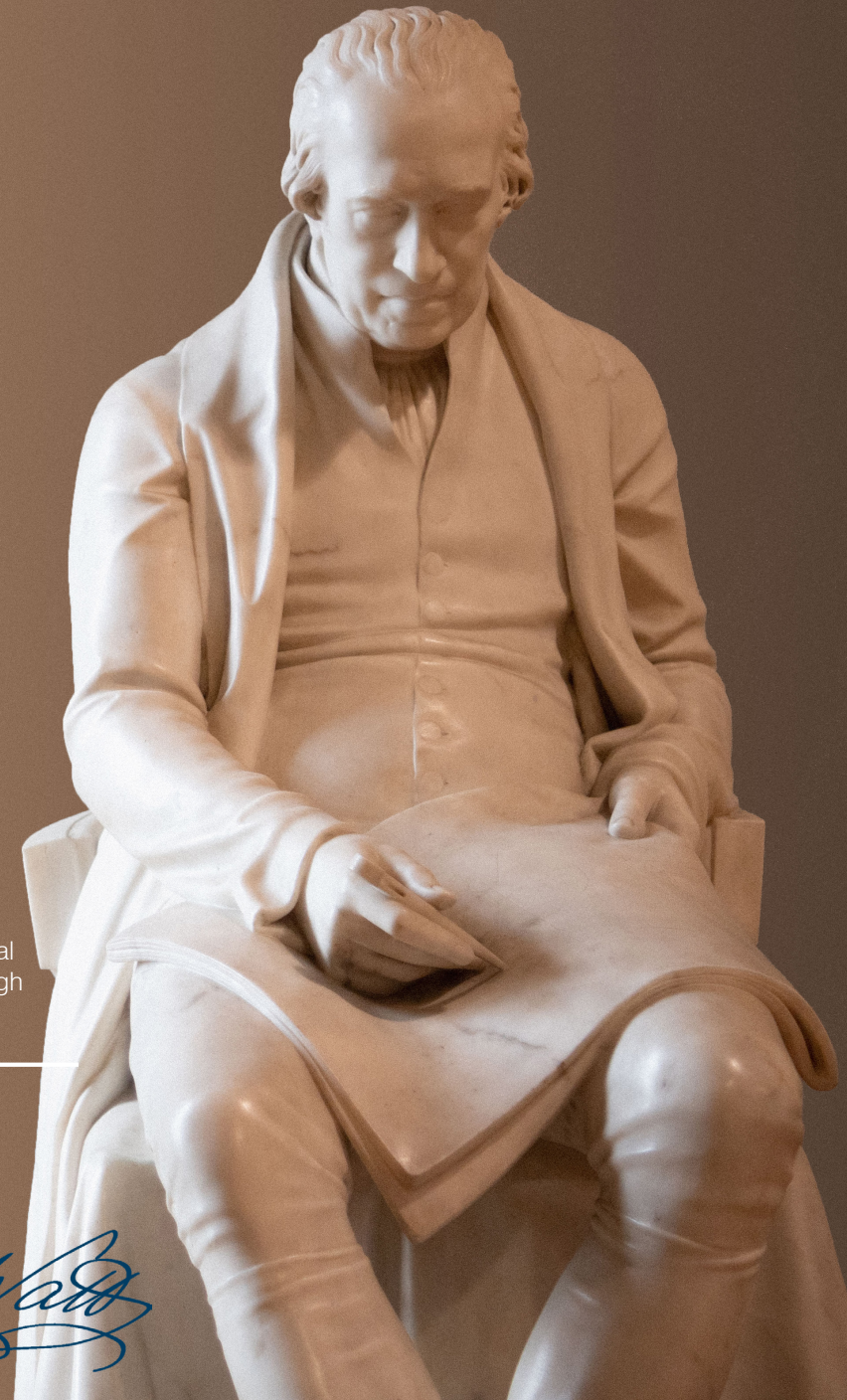
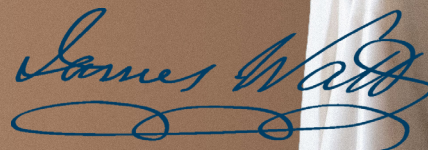
Employed by the University of Glasgow as an Instrument Maker, Watt's first task was to repair a collection of astronomical instruments.

1763

James Watt was presented with a model Newcomen steam engine in need of repair on which he experimented for the next 2-3 years.

1769

Took our first patent for realising steam power.



A scenic sunset over a park with a city skyline in the background. The sun is low on the horizon, casting a warm golden glow across the sky and the green grass of the park. Several people are visible in the park, some sitting on the grass and others standing. The city skyline, including a prominent church spire, is silhouetted against the bright sky.

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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: gla.ac.uk/coursecatalogue

Year 1

- Analogue Electronics 1
- Design and Manufacture 1
- Mechanical Design 1
- Engineering Skills 1
- Materials 1
- Dynamics 1
- Engineering Mathematics 1
- Statics 1
- Thermodynamics 1

Year 2

- Design and Manufacture 2
- Mechanical Design 2
- Materials M2
- Power Electronics 2
- Thermodynamics 2
- Engineering Skills 2
- Mechanics of Structures 2A
- Mechanics of Structures 2B
- Dynamics 2
- Fluid Mechanics 2
- Engineering Mathematics 2

Year 3

- Software Engineering M3
- Control 3
- Mechanical Design 3
- Fluid Mechanics M3
- Heat Transfer 3
- Instrumentation and Data Systems 3
- Design and Manufacture 3
- Simulation of Engineering Systems 3
- Mechanics of Solids 3
- Dynamics 3
- Finite Element Analysis 4

Year 4 BEng

- **Individual Project 4**
- **Mechanical Design 4**
- **Professional Practice 5**

Year 4 MEng

- Integrated System Design Project 4
- Mechanical Design 4

Options

- Materials Engineering M4
- Control 4
- Lasers and Electro-Optic Systems M4
- Mechanics of Solids 4
- Microelectronics in Consumer Products P4
- Robotics 4
- Vibration M4
- Renewable Energy 4
- Advanced Thermal Engineering 4
- Elements of Law for Engineers

Year 5

- Individual Project 5
- Professional Practice 5

Options

- Robust Control 5
- Autonomous Vehicle Guidance Systems
- Structures under External Loads
- Dynamics M5
- Materials Engineering M5
- Ultrasound Technology and Applications
- Advanced Thermal Engineering

Our Mechanical Design Engineering programme is **fully accredited**



TIMETABLE

Sample timetables show an typical schedule. You will normally have between 2 and 4 lectures every 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:

gla.ac.uk/students/myglasgow/

| | 09.00 – 10.00 | 10.00 – 11.00 | 11.00 – 12.00 | 12.00 – 13.00 | 13.00 – 14.00 | 14.00 – 15.00 | 15.00 – 16.00 | 16.00 – 17.00 |
|------|---------------|---|---|--|---|----------------------------------|--|---|
| MON | | Lab 1,2 Eng Skills/Materials/Analogue Electronics 1/Statics Certain weeks | | | Tutorial 1,2 Statics/Mats | | Lecture Mechanical Design 1 | Lecture Mechanical Design 1 Weeks 2-6 |
| TUES | | Lecture Eng Skills 1 | Tutorial 2 Engineering Mathematics 1 | | Lecture Statics 1 Graham Kerr 224 | Lecture Materials 1 JWS354 | Lecture Engineering Mathematics 1 JWS354 | Lecture Analogue Electronics 1 JWS354 |
| WED | | | Lecture Eng Skills 1 JWS354 | Lecture Engineering Mathematics 1 JWS354 | | | | |
| THUR | | Lab Eng Skills/Materials/Analogue Electronics 1/Statics Certain weeks | | | Tutorial 3,4 Statics/Mats | Lecture Statics 1 JWS354 | Lecture Engineering Mathematics 1 JWS354 | Lecture Analogue Electronics 1 JWS354 |
| FRI | | Lab Eng Skills 1 occasional weeks | | | Tutorial 2 Engineering Mathematics 1 | Lecture Materials 1 JWS354 | Lecture Engineering Mathematics 1 JWS354 | |

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.

Wider reading

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.

1840

Regius Professorship in Civil Engng & Mechanics, endowed by Queen Victoria. Making Glasgow the **oldest** school of engineering in the UK.

1914

John Logie Baird begins his studies in Electricity, Engineering and Natural Philosophy.

2007

James Watt Nanofabrication centre opens

1756 – 1764

James Watt was appointed by the University of Glasgow as a mathematical instrument maker

1851

Rankine, "Father of Thermodynamics" appointed to the Regius Chair.

1957

Glasgow was the first Scottish University to have an electronic computer

2019

WHO WILL YOU BECOME

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. You will have covered the techniques but the questions are dressed up in the language of engineering, which may make them a lot more challenging!

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.

So while you will do a significant amount of Mathematics in the first year, this is to 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.

Full solutions are available online. Please don't look at these until you have tried the exercises yourself.

- 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, 500 Ω , 12 V, 16 k Ω .]

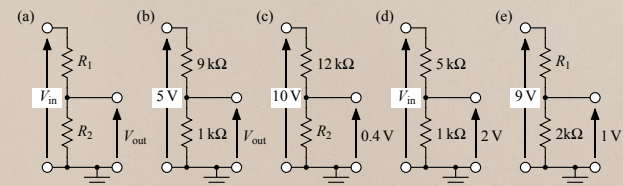


Figure 1: A selection of potential dividers.

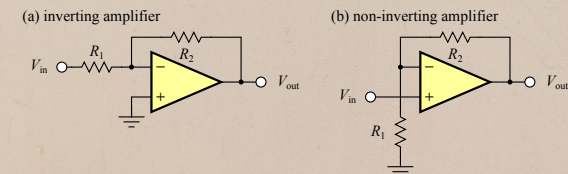


Figure 2: The classic inverting and non-inverting amplifier circuits.

- A remote control draws 10 mA while it is being used and 10 μ A when it is idle. (Make sure that you know the powers of 10 for the prefixes in mA and μ A. 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 μ A]

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]

STUDENT ADVISING SYSTEM IN THE SCHOOL OF ENGINEERING

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.

Useful Contacts:

| | | | |
|--------------------------|------------------------|----------------------------------|---------------|
| Chief Adviser of Studies | Dr Douglas Thomson | Douglas.Thomson@glasgow.ac.uk | 0141 330 6145 |
| School Teaching Office | Rm 620, James Watt Bld | eng-teachingoffice@glasgow.ac.uk | 0141 330 7558 |
| Student Services | Fraser Building | studentservices@glasgow.ac.uk | 0141 330 7000 |

| Discipline | Senior Adviser | e-mail | Phone |
|------------|--------------------|-------------------------------|---------------|
| Aerospace | Dr Richard Green | Richard.Green@glasgow.ac.uk | 0141 330 4312 |
| Biomedical | Dr Manlio Tassieri | Manlio.Tassieri@glasgow.ac.uk | 0141 330 8116 |
| Civil | Dr Trevor Davies | Trevor.Davies@glasgow.ac.uk | 0141 330 5205 |
| EEE | Mr Calum Cossar | Calum.Cossar@glasgow.ac.uk | 0141 330 6003 |
| Mechanical | Dr Phil Dobson | Phil.Dobson@glasgow.ac.uk | 0141 330 4314 |

ENGINEERING SOCIETIES

Student Societies are an invaluable part of the student experience. In recognition of their importance, we, the James Watt School of Engineering, not only support student led activities but we also encourage new initiatives whenever a new opportunity arises. Below, are a number of our established student societies that you will get to meet during Fresher's week.



@UGDBF



@femenginranda



@GUBMES



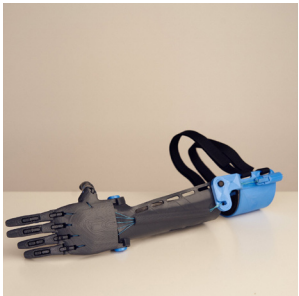
@guengsoc



@jetxengineering



@GUEWB



@handprints.enable



@femeng



@GURobotics

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.

Formula Student has been run by the Institute of Mechanical Engineers since 1998, and since then, tens of thousands of competitors have come through the competition, with graduates now featuring in every Formula 1 team!

@UGRacingFSAE



The Mechanical Design Engineering Induction session

Wednesday 18th September

10:00 - 11:30 Welcome Session, Boyd Orr Building, LT 203

11:30 - 11:45 Lunch, Boyd Orr Building, LT 203

11:45 - 14:00 Ice-breaker session, James Watt South Building

glasgow.ac.uk/engineering

James Watt South Building, University of Glasgow, Glasgow G12 8QQ

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