The Complete University Guide 2019 ranks our RESEARCH QUALITY 6TH IN THE UK for General Engineering

Accredited degrees in a variety of engineering disciplines

Every one of our engineering courses are ranked top 15 in the UK (The Times and Sunday Times, Good University Guide 2019)

The Complete University Guide 2019 ranks our RESEARCH QUALITY 6TH IN THE UK for General Engineering

Innovative teaching

5 star rated teaching (QS stars, 2018)

97% of graduates in employment or further study within 6 months of graduating (DLHE)

94% of our academic staff are producing world-leading or internationally excellent research (REF 2014)

Top 10 in the UK for graduate level employability with comparable size universities (DLHE)

£450m beachside bay campus

Strong industry links

£10 million of new teaching and research equipment

Global community of students from over 115 countries

30,000m² of academic and laboratory space

The following message contains some very important information. Please read it before you use this prospectus.

This guide was printed in the Spring of 2019. It contains information on programmes that Swansea University intends to run for students who are planning to start university in the autumn of 2019 and 2020. We have made every reasonable effort to ensure that the information provided is both helpful and accurate as at the date of publication. However, some changes, for example to programmes, study location, facilities or fees may become necessary due to legitimate staffing, financial, regulatory and academic reasons. We will endeavour at all times to keep any changes to a minimum and to keep prospective students informed appropriately.

Any changes to the information contained in this guide will be updated quarterly.

Undergraduate:
www.swansea.ac.uk/undergraduate-programme-changes and on the online pages at
www.swansea.ac.uk/undergraduate/courses

IMPORTANT INFORMATION – PLEASE READ
Why Engineering?

Solve problems

Apply maths and science to the real world to make a difference

Work in a challenging and lucrative profession

Gain skills that will keep you in demand for your entire career

Be able to change the way we live

DO YOU WANT TO?

YES?

ENGINEERING HAS THE RIGHT COURSE FOR YOU

Accredited degrees increase a graduate’s earning potential, with professionally registered chartered engineers, earning average salaries of £63,000 during their career.

203,000 skilled entrants required annually to meet demand for engineering enterprises through to 2024.

£25,600

£21,700

GRADUATE SALARIES

Engineering

All

(Engineering UK 2018 Report)

WE CANNOT

SOLVE OUR PROBLEMS

WITH THE

SAME THINKING

WE USED WHEN WE

CREATED THEM

ALBERT EINSTEIN
CAREER SUPPORT

We are committed to ensuring that our students are provided with the best level of employability support from day one of their degree with us.

We have a dedicated Employability Team within the College, whose role it is to continuously provide opportunities for our students to improve their skills and find their perfect career post graduation.

Our support includes:
- Annual Engineering Careers Fair
- Weekly Graduate Employer Presentations
- CV Guidance
- Mock Interviews & Assessment Centre Sessions
- Site Visits
- Year in Industry Lectures
- Summer Placement Support
- Industrial Mentoring
- Alumni Networking Sessions

Our vision for employability is to equip our engineering graduates with the ability to address engineering challenges of the future, leading to fulfilling and distinguished careers. Professional and capable, they will demonstrate the value of having a Swansea University Engineering degree as the backbone to a rewarding engineering career.

Dr Sam Rolland, Director of Employability in the College of Engineering

I have been able to make use of the company visits to secure myself interviews for placement work over the summer and hope that once I graduate I can get a graduate job with the same company.

Manesh Patel, 3rd Year Electronic and Electrical Engineering student

INDUSTRY

All of our degree programmes offer a YEAR IN INDUSTRY SCHEME

OUR STUDENTS HAVE UNDERGONE PLACEMENTS WITH

AIRBUS BMW BOSCH CARGIL CUMMINS DTR MEDICAL GE AVIATION GSK JCB RED BULL TATA STEEL VALERO
JOIN OUR
Formula Student Team

Design and build a racing car, learn new skills, work in a team and compete in FSUK in Silverstone

MORE INFORMATION CAN BE FOUND AT:
WWW.MOTORSPORT.SWAN.AC.UK

COLLABORATION
WITH INDUSTRY

We have strong and established links with a large variety of local, national and international companies, both with our teaching and research, and as graduate employers and placement providers.

AECOM  Airbus  ATKINS  BAE Systems
ARUP GROUP  Babcock International Group  BMW  BP
Bloomberg SCC  Dow Corning  British Airways
Chevron  EDF Energy  IBM
Ford Motor Company  French Connection UK
FUJITSU  JN Bentley
Hyder Consulting UK  JAGUAR LAND ROVER
Jones Bros  MURCO PETROLEUM  Laing O'Rourke
Kier Group  Philips 66  Panasonic Corporation
Mercedes AMG  Petronas  Qinetiq
THE ROYAL MINT
Quantex  MINISTRY OF DEFENCE
ROYAL NAVY  WorleyParsons
MOTT MACDONALD  Royal Military Academy
Offshore Design Engineering Ltd (Ode)  Royce
Tate Steel  TAYLOR & LYLE

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Chevron  EDF Energy  IBM
Ford Motor Company  French Connection UK
FUJITSU  JN Bentley
Hyder Consulting UK  JAGUAR LAND ROVER
Jones Bros  MURCO PETROLEUM  Laing O'Rourke
Kier Group  Philips 66  Panasonic Corporation
Mercedes AMG  Petronas  Qinetiq
THE ROYAL MINT
Quantex  MINISTRY OF DEFENCE
ROYAL NAVY  WorleyParsons
MOTT MACDONALD  Royal Military Academy
Offshore Design Engineering Ltd (Ode)  Royce
Tate Steel  TAYLOR & LYLE

MORE INFORMATION CAN BE FOUND AT:
WWW.MOTORSPORT.SWAN.AC.UK
STUDENT SUPPORT, TEACHING & LEARNING

Providing the best student experience possible is of the utmost importance to us at the College, and we have well-established systems and support staff in place in order to facilitate this.

ACADEMIC MENTOR PROGRAMME

Each student is assigned a Personal Academic Mentor (previously known as a Personal Tutor), with whom they meet throughout the year in a series of compulsory individual and group sessions. Your Personal Academic Mentor is there to provide support and encouragement to help you achieve your academic potential, and as an individual academic contact for every student.

STUDENT REPRESENTATIVES

A Student Representative is elected from each programme for each year of study to provide the feedback and views of the student body on a range of topics to academic and support staff at the monthly Student-Staff Forums.

ONLINE RESOURCES

Open to all Engineering students. We run cafés in Maths, Computer Aided Engineering, Software, Science, and Writing.

STUDENT INFORMATION TEAM

The Student Information Team is your gateway to accessing advice and guidance during your studies here at the College of Engineering. You can reach the team in person via the College of Engineering Reception in Engineering Central, between 8:30am-5pm Monday-Friday (excluding bank holidays).

STUDENT OFFICE HOURS

All teaching staff have designated office hours during the week. Students are encouraged to drop in to discuss lecture content, request assignment feedback, or to raise any academic issues that they have.

FIND OUT MORE

Check out our student guide at: www.swansea.ac.uk/engineering/courses/student-support

MATHS & COMPUTER AIDED ENGINEERING

The Café is open to all students in the College of Engineering and operates on a drop-in basis. The Café is manned by specially HESTEM trained postgraduate students with support from academic staff.

Tuesday, Wednesday & Thursday afternoons, 1pm-3pm, in Engineering Central A027 Opposite Coffeeopolis.

f′(x) = lim \( \frac{f(x+h) - f(x)}{h} \)

\( x \nabla^2 = 0 \)

\( \nabla \cdot \epsilon \nabla V = -\rho \)

\( \frac{1}{2} \rho v^2 \)

\( \cos^2 x + \sin^2 x = 1 \)

\( \frac{d^2}{dx^2} \left( EI \frac{d^2 w}{dx^2} \right) = q \)

\( \frac{1}{2} \rho v^2 + \rho gh + p = \text{constant} \)

\( \frac{\partial \rho}{\partial t} + \nabla \cdot \rho \nabla V = 0 \)

\( e^{i\pi} = -1 \)

\( e^{-i\pi} = -1 \)

\( \sin^2 x \)

\( \frac{\partial u}{\partial t} = k \frac{\partial^2 u}{\partial x^2} \)

\( a \cdot b = |a| |b| \cos \theta \)

\( \nabla^2 A + k^2 A = 0 \)
From the development of the Finite Element Method at Swansea in the 1960s to our present day research turning buildings into power stations, we strive for our research to have a real impact.

Research pioneered at the College of Engineering harnesses the expertise of academic staff within the department.

Research groups within the College are focusing on a variety of areas, including alternative energy, membrane technology, aerospace materials, printing technology, aerodynamic design and medical diagnosis.

**CURRENT PROJECTS**

- Improved aerodynamic design process for the aerospace industry through the application of unstructured mesh technology
- Improve the efficiency and environmental sustainability of gas turbine engines for Rolls-Royce
- Developing marine energy with minimum environmental impact
- Use of new diagnostic medical technology to improve detection of abnormal blood clotting
- Optimisation of membrane systems and its benefit to water treatment, food processing and medicine

**WE TRANSFORM BUILDINGS INTO POWER STATIONS BY ENABLING THEM TO GENERATE, STORE, AND RELEASE THEIR OWN ENERGY**

Swansea University’s Active Classroom is the UK’s first energy-positive classroom. By combining an integrated solar roof and battery storage with solar heat collection, the Active Classroom produces more energy than it consumes. Swansea University and SPECIFIC’s innovation and knowledge centre designed and built the classroom.

The Active Office and Classroom are linked together and able to share energy with each other and electric vehicles, demonstrating how the concept could be applied in an energy-resilient solar-powered community.

**BREAKING RESEARCH NEWS**

- Computational Aerodynamics System Revolutionises Design of Bloodhound
- New diagnostic medical technology detects abnormal blood clots earlier

We’re changing the world

WE TRANSFORM BUILDINGS INTO POWER STATIONS BY ENABLING THEM TO GENERATE, STORE, AND RELEASE THEIR OWN ENERGY

Turning homes into power stations could cut household fuel bills by £600

Energy consumption could be cut by more than 60% if homes were designed to generate, store and release their own solar energy.

Find out more about our world-changing research

www.swansea.ac.uk/engineering/research
BEACHFRONT LOCATION

OTHER FACILITIES:
• Coffeeopolis coffee shop
• Faith space
• Gym and sports facilities
• Launderette
• Students’ Union

24HR BUS (term-time)
Approximately 20 minutes to Singleton Campus, 10 minutes to city centre

MY UNIHUB
Your one-stop-shop offering information and guidance on any aspect of student life; from finances, to course-load, to housing

BAY LIBRARY
COMPUTATIONAL FOUNDRY
ENGINEERING
STUDENT ACCOMMODATION
SCHOOL OF MANAGEMENT
THE COLLEGE
THE CORE, FOOD COURT
THE GREAT HALL
SPORT AND EXERCISE SCIENCE

swansea.ac.uk/virtual-tour
Wales is one of the four countries that make up the United Kingdom (UK). Wales has its own language – the oldest living language in Europe – and the University offers discounted Welsh lessons if you would like to learn!

Wales has an abundance of castles to explore, mountains to climb and delicious local dishes to try – the perfect antidote to a long week of studying. If you would like to find out more about things to do in Wales, we recommend that you visit: visitwales.co.uk

10 Things YOU MUST DO

1. Eat Joe’s Ice Cream
2. Paddle in Swansea Bay
3. Visit the National Waterfront Museum – one of many museums and galleries in the city
4. Surf down the Gower
5. Grab fish & chips at Mumbles Pier
6. Walk around our Marina
7. Socialise with friends on Wind Street
8. Eat Welsh cakes at Swansea Market
9. Watch football, or the nation’s favourite, rugby at the Liberty Stadium
10. Take in a show at the Grand Theatre

Wales is the land of mythical King Arthur

It's a beautiful location and a buzzing city; warm and friendly, it’s compact, yet offers it all.

Swansea is as rich an environment for living as it is for learning. From its breath-taking sweep of award-winning beaches and coves to its dazzling nightlife, eclectic dining and unique shopping experiences, it’s 378km² of everything you need to make your student experience amazing.

WHEREVER YOU GO IN SWANSEA...
you’re by the sea

Swansea is the 5th most affordable university city in the UK

(Swansea Has an estimated population of 241,300 (Times Higher Education 2018))

HOME OF THE GOWER THE UK’S FIRST AREA OF OUTSTANDING NATURAL BEAUTY

St David is the patron saint of Wales and is celebrated yearly on St. David’s Day: 1st March.

Robert Recorde of Pembrokeshire invented the “EQUAL TO” sign.
OUR ACADEMICS
The College of Engineering has over 786 members of staff, including 152 academics, 217 professional service and 200 research staff.

I’ve come from a career in industry, so I know what attributes the top companies are looking for in Engineering graduates.

Dr Patricia Xavier

The work that I have been doing at Swansea has shaped the design of the BLOODHOUND SSC and has inspired a range of new research ideas.

Dr Ben Evans

As the University’s Dean of Educational Technology I am passionate about enabling the very best approaches to learning and teaching. On a daily basis I help staff and students research, trial and employ a spectrum of educational technologies.

Dr Paul Holland

As a College we are committed to the advancement of gender equality and dedicate substantial efforts to ensuring the principles of Athena SWAN are embedded in our college culture for the benefit of all students and staff.

Dr Camilla Knight

You can find out more information about our academic staff on our website: www.swansea.ac.uk/engineering/staff
The College of Engineering runs an annual expedition to Zambia that gives students and staff the opportunity to put their theoretical knowledge into practice by completing a humanitarian project.

**AUSTRALIA**
**CANADA**
**CZECH REPUBLIC**
**FRANCE**
**GERMANY**
**SPAIN**
**USA**

During my time in Beijing, I had the opportunity to meet people from all parts of the globe, which was very interesting as I got to meet many different cultures.

Georgios Kontosis
BEng Mechanical Engineering (Summer Abroad)

www.swansea.ac.uk/engineering/international-expeditions
WE ARE A TRULY GLOBAL COLLEGE OF ENGINEERING...

KAROLINE KJUSS, NORWAY
“I wanted a university with top study facilities and lecturers, and of course a University with a good location. I got more than I expected.”

MEREDITH DAVIES, USA
“Living in Swansea was exciting because I don’t go to school in a large city. Swansea is big enough to have a lot going on, but small enough so it isn’t overwhelming.”

FELIX MMEKA, NIGERIA
“I needed to find an amazing city (amazing people and scenes, balanced lifestyle of both education and extra-curricular activities, low cost of living, etc.) that I could call home while studying and after 5 amazing years, I can say I haven’t been disappointed with that choice.”

BLYTON PEREIRA, INDIA
“I decided to come to Swansea due to its great reputation in the UK and the world.”

ANQI LI, CHINA
“I really enjoyed Swansea and found the lecturers very supportive.”

AHMED MAHMOUD, EGYPT
“Staff members are incredibly supportive. I sensed that during my stay and even before arriving here. My course supervisor kept (and is still) checking up on me regularly during my course duration. To sum up, the institution embraced me from day one, and I couldn’t have been more thankful.”

HUEY YII KUOK, MALAYSIA
“I decided to study Engineering at Swansea University after I read up on the impressive graduate employability percentages and the ranking of the College of Engineering online. I really liked what I found.”

NASSER AL-KAABI, QATAR
“I decided to study a BEng in Mechanical Engineering at Swansea University because Swansea is a safe place and the University has a good population.”

MEREDITH DAVIES, USA
“Living in Swansea was exciting because I don’t go to school in a large city. Swansea is big enough to have a lot going on, but small enough so it isn’t overwhelming.”

KAROLINE KJUSS, NORWAY
“I wanted a university with top study facilities and lecturers, and of course a University with a good location. I got more than I expected.”
Innovative TEACHING

We’re proud to provide an outstanding learning experience and are championing ‘blended learning’, which includes the use of online/e-learning technologies to complement, support and enhance traditional face-to-face learning methods. Blended learning includes:

VIRTUAL REALITY
Visiting buildings before they’re built, or learning about intimate parts of machinery, helps give our students a new understanding of what they are studying.

LIGHTBOARD
Built by a team of our undergraduate students, our Lightboard Studio allows the creation of interactive videos, where the presenter faces towards the screen with overlaid writing and PowerPoint slides.

LECTURE CAPTURE
Many of our academics record their lectures, so that students can re-watch them in their own time.

ONLINE LEARNING MATERIALS
Created by our academics to enhance student understanding of difficult topics.

COURSE DIRECTORY

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AEROSPACE ENGINEERING

Aerospace Engineering is the classical engineering discipline for the design, manufacture and maintenance of aerospace vehicles.

Here is a sample of the topics you will study during your degree:

YEAR 1
• Strength of Materials
• Fluid Mechanics
• Thermodynamics
• Design and Laboratory Classes
• Engineering Design
• Engineering Mechanics
• Introduction to Materials Engineering
• Engineering Analysis
• Introduction to Aerospace Engineering

YEAR 2
• Computer Aided Engineering
• Aerodynamics
• Airframe Structure
• Flight Mechanics
• Aerospace Systems
• Structural Mechanics for Aerospace Engineers
• Aerospace Control
• Experimental Studies – Aerospace
• Rocket and Space Technology (optional)
• Mechanical Properties of Materials (optional)

YEAR 3 – FHEQ LEVEL 6
• Gas Dynamics
• Research Project
• Engineering Management
• Propulsion
• Aerospace Engineering Design
• High Performance Materials and Selection
• Satellite Systems (optional)
• Space Propulsion and Power Systems (optional)
• Finite Element Method (optional)
• Computational Aerodynamics (optional)

YEAR 4 – FHEQ LEVEL 7 (MEng ONLY)
• Fluid-Structure Interaction
• Group Project
• Numerical Methods for Partial Differential Equations
• Advanced Airframe Structures
• Flight Dynamics and Control
• Strategic Project Planning
• Advanced Aerodynamics
• Structural Integrity of Aerospace Materials
• Finite Element Method (optional)
• Simulation Based Product Design (optional)

For the most up-to-date module information, access our course pages here: www.swansea.ac.uk/engineering/aerospace

CAREERS
Swansea graduates are consistently in high demand with aerospace engineering employers. Below is a list of typical career prospects for aerospace graduates:

• Aerodynamicist in Motorsport and Sustainable Energy Sector
• Aircraft Design Engineer
• Aircraft MRO Engineer
• Aircraft Systems Engineer
• Airline Pilot
• Automotive Engineer
• Defence Engineer
• High Speed Railway Engineer
• Rocket Scientist
• Satellite Design Engineer
• Space Applications Engineer

AT WORK WITH...
Reem Banjarad
GLOBAL FLEET PLANNER, MAXAM

I am now working for Maxam, a leading brand in the global mining civil explosives market, as a Global Fleet Planner for the MSUs (Mobile Sensitiser Units). My role is quite transversal and I am continuously in contact with all departments to organise the manufacturing, coordinate the sending and later analyse, control and report the productions of the fleet.

My civil engineering degree has helped me when it comes to the analytical aspect of my day to day at the company where I must analyse the fleet efficiency and suggest solutions. At the moment I am in the heart of the first step in the construction supply chain, and coming from a civil engineering background, it is useful to understand the whole process and different projects such as underwater port extensions, tunnel creation, quarry and big mine operations.

GET IN TOUCH
Email: engineering@swansea.ac.uk
Tel: +44 (0)1792 295514
swansea.ac.uk/engineering

TYPICAL OFFER:
ABB – BBB BEng
AAB – ABB MEng
(including Mathematics)
see website for further details

BEng Aerospace Engineering H400
with a Year in Industry
H402
with a Year Abroad
H401

MEng Aerospace Engineering H403
with a Year in Industry
H404
with a Year Abroad
H406

5TH IN THE UK
FOR GRADUATE PROSPECTS
Times University Guide 2019

H400
H402
H401
H403
H404
H406

H400
H402
H401
H403
H404
H406

H400
H402
H401
H403
H404
H406

H400
H402
H401
H403
H404
H406
**CHEMICAL ENGINEERING**

Chemical engineers design, operate and optimise chemical and physical processes that turn raw materials into valuable products for human use.

**TYPICAL OFFER:**
- BEng: ABB – BBB
- MEng: AA – ABB
  - (including Mathematics)
- see website for further details

**CHEMICAL ENGINEERING AT SWANSEA IS RANKED**

10TH IN THE UK

Times Good University Guide 2019

**YEAR 1 – FHEQ LEVEL 4**
- Chemical Process Principles
- Chemical and Environmental Engineering Laboratory
- Heat Transfer
- Chemical Engineering Skills
- Fluid Mechanics
- Environmental Awareness for Engineers
- Engineering Analysis
- Process Analysis and Design
- Introductory Organic Chemistry
- Instrumental and Analytical Chemistry

**YEAR 2 – FHEQ LEVEL 5**
- Separation Processes
- Biochemical Engineering
- Reactor Design
- Instrumentation Measurement and Control
- Process Design and Simulation
- Thermodynamics of Process Design
- Fluid Flow
- Process Modelling
- Process and Pilot Plant Operations
- Statistical Techniques in Engineering

**YEAR 3 – FHEQ LEVEL 6**
- Safety and Loss Prevention
- Process Equipment Design, Selection & Control
- Particulate Systems
- Reactor Design
- Separation Processes
- Engineering Management
- Energy and Low Carbon Technologies
- Chemical Engineering Design Project
- Environmental Engineering Practice
- Design Project
- Colloid and Interface Science
- Complex Fluids and Rheology
- Optimisation
- Biochemical Engineering
- Membrane Technology (optional)
- Water and Wastewater Engineering (optional)
- Principles of Nanomedicine (optional)
- Desalination (optional)
- Pollutant Transport by Groundwater Flows (optional)
- Process and Pilot Plant Operations
- Statistical Techniques in Engineering
- Engineering Analysis
- Process Analysis and Design
- Introductory Organic Chemistry
- Instrumental and Analytical Chemistry

**YEAR 4 – FHEQ LEVEL 7 (MEng ONLY)**
- Process and Pilot Plant Operations
- Statistical Techniques in Engineering
- Engineering Analysis
- Process Analysis and Design
- Introductory Organic Chemistry
- Instrumental and Analytical Chemistry
- Design Project
- Colloid and Interface Science
- Complex Fluids and Rheology
- Optimisation
- Biochemical Engineering
- Membrane Technology (optional)
- Water and Wastewater Engineering (optional)
- Principles of Nanomedicine (optional)
- Desalination (optional)
- Pollutant Transport by Groundwater Flows (optional)

**CHEMICAL ENGINEERING AT SWANSEA IS RANKED**

10TH IN THE UK

Times Good University Guide 2019

**TYPICAL OFFER:**
- BEng: ABB – BBB
- MEng: AA – ABB
  - (including Mathematics)
- see website for further details

**GET IN TOUCH**

Email: engineering@swansea.ac.uk
Tel: +44 (0)1792 295514
swansea.ac.uk/engineering

**AT WORK WITH...**

**Hozea Arsiwala**

**PROCESS ENGINEER, CLIMAX MOLYBDENUM**

I am currently working as a Process Engineer in a company called Climax Molybdenum, which is a Freeport-McMoran company. The site that I work for is a smelting plant which produces a chemical called Ferro-Molybdenum, which goes into steel to give its particular properties. I am currently looking into process safety and process optimisation.

The degree has not only helped with my education but also helped with my social and personal skills. I have learnt how to handle daily issues logically. I have had a brilliant time studying in Swansea University; I still do miss it. I have made great friends and still carry a strong relationship with most of my lecturers.
CIVIL ENGINEERING

Civil Engineers play an integral role in modern society and are responsible for the built environment that surrounds us.

Here is a sample of the topics you will study during your degree:

YEAR 1 – FHEQ LEVEL 4
- Civil Laboratory
- Engineering Sustainability
- Strength of Materials
- Highway Design and Surveying
- Conceptual Design
- Engineering Mechanics
- Introduction of Materials Engineering
- Engineering Analysis
- Civil Engineering Structural Analysis Practice
- Fluid Mechanics

YEAR 2 – FHEQ LEVEL 5
- Fluid Mechanics
- Structural Mechanics
- Reinforced Concrete Design
- Basic Soil Mechanics
- Steel Design

YEAR 3 – FHEQ LEVEL 6
- Problem Solving in Engineering with Matlab
- Engineering Management (Civil)
- Dynamics
- Civil Engineering Design Practice
- Introductory Geology for Engineers

YEAR 4 – FHEQ LEVEL 7
(MEng ONLY)
- Fluid-Structure Interaction
- Dynamics and Transient Analysis
- Computational Plasticity
- Reservoir Modelling and Simulation
- Finite Element Computational Analysis
- Advanced Structural Design
- Advanced Structural Analysis
- Flood Risk Management
- Group Project
- Coastal Engineering

For the most up-to-date module information, access our course pages here: www.swansea.ac.uk/engineering/civil

GET IN TOUCH
Email: engineering@swansea.ac.uk
Tel: +44 (0)1792 295514
swansea.ac.uk/engineering

AT WORK WITH...

George Lance
ASSISTANT ENGINEER, ATKINS

I am currently an Assistant Engineer at Atkins. I work with multidisciplinary teams across the UK and India to help deliver a variety of new build and highway improvement schemes.

The industry related modules taught as part of the course were great at preparing me for the way real world projects work.

The group project during my MEng year in particular was really good experience, and the opportunity to work with industry professionals was brilliant practice for the graduate world.

CAREERS

Swansea graduates are consistently in high demand with civil engineering employers. Below is a list of typical career prospects for Civil Engineering graduates:

- Building Control Surveyor
- Consulting Civil Engineer
- Contracting Civil Engineer
- Site Engineer
- Structural Engineer
- Geotechnical Engineer
- Water Engineer
- Town Planner
- Building Services Engineer
- Engineering Geologist
- Environmental Consultant
- Quantity Surveyor

CIVIL ENGINEERING AT SWANSEA IS RANKED 13TH IN THE UK

Times Good University Guide 2019

TYPICAL OFFER:
- BEng H200 with a Year in Industry H202 with a Year Abroad H206
- MEng H201 with a Year in Industry H204 with a Year Abroad H207

Typical Offer: ABB – BBB BEng
AAB – ABB MEng
(including Mathematics)

see website for further details

CAREERS

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- Contracting Civil Engineer
- Site Engineer
- Structural Engineer
- Geotechnical Engineer
- Water Engineer
- Town Planner
- Building Services Engineer
- Engineering Geologist
- Environmental Consultant
- Quantity Surveyor

YEAR 1 – FHEQ LEVEL 4
- Civil Laboratory
- Engineering Sustainability
- Strength of Materials
- Highway Design and Surveying
- Conceptual Design
- Engineering Mechanics
- Introduction of Materials Engineering
- Engineering Analysis
- Civil Engineering Structural Analysis Practice
- Fluid Mechanics

YEAR 2 – FHEQ LEVEL 5
- Fluid Mechanics
- Structural Mechanics
- Reinforced Concrete Design
- Basic Soil Mechanics
- Steel Design

YEAR 3 – FHEQ LEVEL 6
- Problem Solving in Engineering with Matlab
- Engineering Management (Civil)
- Dynamics
- Civil Engineering Design Practice
- Introductory Geology for Engineers

YEAR 4 – FHEQ LEVEL 7
(MEng ONLY)
- Fluid-Structure Interaction
- Dynamics and Transient Analysis
- Computational Plasticity
- Reservoir Modelling and Simulation
- Finite Element Computational Analysis
- Advanced Structural Design
- Advanced Structural Analysis
- Flood Risk Management
- Group Project
- Coastal Engineering

For the most up-to-date module information, access our course pages here: www.swansea.ac.uk/engineering/civil

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swansea.ac.uk/engineering

AT WORK WITH...

George Lance
ASSISTANT ENGINEER, ATKINS

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The industry related modules taught as part of the course were great at preparing me for the way real world projects work.

The group project during my MEng year in particular was really good experience, and the opportunity to work with industry professionals was brilliant practice for the graduate world.
Electronic and Electrical Engineering is amongst the most exciting and progressive subjects available today, catering to projects such as mobile phone networks and renewable energy sources that define and mould the world around us.

**Electrical & Electrical Engineering**

TYPICAL OFFER:
- BEng – AAB (including Mathematics)
- MEng – BBB

see website for further details

**Careers**

Students have progressed into a wide variety of industry sectors, including research centres, the public sector and as entrepreneurs. Below is a list of typical career prospects for graduates:

- Analogue and Digital Circuit Design Engineer
- Broadcast Engineer
- Control and Instrumentation Engineer
- Electrical Engineer
- IT Consultant
- Multimedia Programmer
- Power Systems and Power Electronics Engineer
- Systems Analyst
- Technical Author
- Technical Sales Engineer
- Telecommunication Engineer

Here are a sample of the topics you will study during your degree:

**Year 1 – FHEQ Level 4**
- Instrumentation of Control
- Digital Design
- Dynamic Systems
- Signals and Systems
- Microcontrollers
- Analogue Design
- Circuit Analysis
- Engineering Analysis
- Power Engineering
- Functional and Smart Materials

**Year 2 – FHEQ Level 5**
- Electronic Circuits
- Electrical Machines
- Electronic Materials and Devices
- Control Systems
- Software Engineering
- Signals and Systems
- Group Design Exercise
- Electromagnetics
- Semiconductor Technology
- Practical Circuits
- IC Design
- Microwave Circuits and Antennas
- Power Systems
- Power Electronics
- Research Project
- Engineering Management
- Communications
- Digital Communications (optional)
- Quantum Devices (optional)
- Nanoelectronics (optional)

**Year 3 – FHEQ Level 6**
- Power Semiconductors
- Advanced Power Electronics and Drives
- Modern Control Systems
- Advanced Power Systems
- Energy and Power Electronics Laboratory
- Signals and Systems (optional)
- Digital Communications (optional)
- Wireless Communications (optional)
- Optical Networks (optional)
- Problems at the Nanoscale (optional)

**Year 4 – FHEQ Level 7**
(MEng ONLY)
- Power Semiconductor Devices
- Advanced Power Electronics and Drives
- Energy and Power Electronics Laboratory
- Signals and Systems (optional)
- Digital Communications (optional)
- Wireless Communications (optional)
- Optical Networks (optional)
- Problems at the Nanoscale (optional)

Year 4 is only offered on the MEng degree.

For the most up-to-date module information, access our course pages here:
www.swansea.ac.uk/engineering/electrical

**Get in touch**

Email: engineering@swansea.ac.uk
Tel: +44 (0) 1792 295514
swansea.ac.uk/engineering

**At Work With...**

**Andy Dodd**

Graduate Engineer, Horiba MIRA

My degree catapulted me into a graduate engineer role at HORIBA-MIRA, a world-class centre for vehicle engineering, test and development. The course covered a broad range of topics, building strong foundations on which I could start my career. Using the knowledge and skills I developed at Swansea University, I quickly became an effective member of the team and regularly work alongside experts in the field.
Materials Science and Engineering is a multi-disciplinary subject, which focuses on the control of properties of matter for application in numerous sectors of science and engineering.

**TYPICAL OFFER:**
- BEng Materials Science and Engineering with a Year in Industry J502 with a Year Abroad J510
- MEng Materials Science and Engineering with a Year in Industry J503 with a Year Abroad J506

Here is a sample of the topics you will study during your degree:

**Year 1 – FHEQ Level 4**
- Introduction to Materials Engineering
- Manufacturing Technology
- Materials Resources
- Mechanical Properties of Materials
- Materials Practical: Structure/Property Links in Metals
- Engineering Analysis for Materials
- Instrumental and Analytical Chemistry
- Engineering Sustainability (optional)
- Foundation Chemistry (optional)
- Engineering Science (optional)

**Year 2 – FHEQ Level 5**
- Functional and Smart Materials
- Microstructure Evolution and Control in Metallic Materials
- Polymers: Structures and Processing
- Computational Materials
- Mechanical Deformation in Structural Materials
- Microstructure Development in Alloy Systems
- Applied Examples in Polymeric and Metallic Materials
- Order and Disorder in Materials
- Modelling and Simulation of Materials
- Strength of Materials

**Year 3 FHEQ Level 6**
- Research Project
- Fracture and Fatigue
- Ceramics
- Polymers: Properties and Design
- Engineering Management
- Metals: Advanced Manufacturing and Protection
- Microstructure and Characterisation
- Physical Metallurgy of Steels
- Composite Materials

**Year 4 – FHEQ Level 7 (MEng ONLY)**
- Polymer Processing
- Additive Manufacturing
- Entrepreneurship for Engineers
- Group Project
- Simulation Based Product Design
- Strategic Project Planning
- Structural Integrity of Aerospace Metals
- Aerospace Materials Engineering
- Power Generation Systems
- Environmental Analysis and Legislation

**CAREERS**
Materials Science and Engineering graduates have a variety of career options available to them in industrial sectors including: aerospace, the automotive industry, manufacturing, sports and energy generation. Below is a list of typical career prospects for Materials Science and Engineering graduates:
- Biomedical Engineer
- Manufacturing Systems Engineer
- Materials Engineer
- Metallurgist
- Patent Examiner
- Product Development Scientist
- Quality Manager
- Research Scientist

For the most up-to-date module information, access our course pages here: www.swansea.ac.uk/engineering/materials

**GET IN TOUCH**
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Tel: +44 (0)1792 295514
swansea.ac.uk/engineering

**MATERIALS SCIENCE & ENGINEERING AT SWANSEA IS RANKED**
3rd in the UK for graduate prospects (Times Good University Guide 2019)

**AT WORK WITH...**
Sarah Bagnall
Consultancy Manager, R-Tech Materials

My role specialises in failure analysis, particularly for the petrochemical, oil and gas, and power generation industries. I manage the operational activities of the consultancy business, business development and the investigative metallurgical work. This includes failure analysis, quality problems and product liability issues for a variety of industries, particularly in power generation, petrochemical and process plant for an international client base.

I also manage the consultancy business’ research and development programmes; an ongoing project is an Innovate UK funded study to develop a novel integrity model for stainless steels in high temperature nuclear applications in partnership with EDF Energy. This project follows on from a previous Innovate funded project and the master’s I completed with Swansea University on the thermal degradation of austenitic stainless steels.
MECHANICAL ENGINEERING

Mechanical Engineers are innovative professionals, found at the core of every aspect of the modern engineering industry, from concept to invention.

Here is a sample of the topics you will study during your degree:

**YEAR 1 – FHEQ LEVEL 4**
- Engineering Sustainability
- Strength of Materials
- Fluid Mechanics
- Thermodynamics
- Design and Laboratory Classes
- Engineering Mechanics
- Engineering Professional Development
- Introduction to Materials Engineering
- Manufacturing Technology
- Engineering Analysis

**YEAR 2 – FHEQ LEVEL 5**
- Dynamic Systems
- Thermodynamics
- Stress Analysis
- Computer Aided Engineering
- Design of Machine Elements
- Manufacturing Technology
- Fluid Mechanics
- Heat Transfer (optional)
- Circuit Analysis (optional)
- Digital Manufacturing (optional)

**YEAR 3 – FHEQ LEVEL 6**
- Control Systems
- Research Project
- Fluid Mechanics
- Manufacturing Optimisation
- Engineering Management
- Mechanical Engineering Practice
- Mechanical Engineering Design
- Finite Element Method (optional)
- Dynamics (optional)
- Kinematics for Running a Robot (optional)

**YEAR 4 – FHEQ LEVEL 7 (MEng ONLY)**
- Advanced Thermo Fluid Dynamics
- Polymer Processing
- Systems Monitoring, Control, Reliability, Survivability, Integrity and Maintenance
- Additive Manufacturing
- Entrepreneurship for Engineers
- Group Project
- Simulation Based Product Design
- Strategic Project Planning
- Metallurgy and Process Optimisation
- Advanced Solid Mechanics

For the most up-to-date module information, access our course pages here: www.swansea.ac.uk/engineering/mechanical

TYPICAL OFFER:
- BEng – ABB
- AAB – ABB MEng
(including Mathematics)

see website for further details

MECHANICAL ENGINEERING AT SWANSEA IS RANKED

9TH IN THE UK

Times Good University Guide 2019

CAREERS

Mechanical Engineering students from Swansea University have progressed into a vast array of roles in numerous sectors. Below is a list of typical career prospects for Mechanical Engineering graduates:

- Aerospace Engineer
- Automation Engineer
- Automotive Engineer
- Design Engineer
- Industrial Engineer
- Maintenance Engineer
- Manufacturing Engineer
- Mechanical Engineer
- Project Manager
- Reliability Engineer
- Research Engineer
- Stress Engineer

GET IN TOUCH

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swansea.ac.uk/engineering

AT WORK WITH...

Aungshu Rahman
SAP MAINTENANCE PLANNER, BMW MINI

I’m currently working as a SAP Maintenance Planner at Body in White technology, in BMW MINI, Plant Oxford. My work primarily involves providing SAP support to the Central Maintenance and the production team, reporting to the managerial level and director on technology performance, as well as working on various projects to support the current and the new vehicle manufacturing process.
MEDICAL ENGINEERING

Medical Engineering is a multi-disciplinary subject consisting of the application of core engineering principles to a broad range of instrumentation used in modern medicine.

Here is a sample of the topics you will study during your degree:

YEAR 1 – FHEQ LEVEL 4
• Strength of Materials
• Instrumentation of Control
• Circuit Analysis
• Fluid Mechanics
• Introduction to Material Engineering
• Numerical Methods for Biomedical Engineers
• Chemical Engineering Science
• Human Physiology
• Human Neuromusculoskeletal Systems
• Engineering Mechanics (optional)

YEAR 2 – FHEQ LEVEL 5
• Fluid Flow
• Process Modelling
• Statistical Methods in Engineering
• Heat Transfer
• Design for Medical Engineering
• Experimental Studies for Medical Engineers
• Cell Biology and Cell Mechanics for Engineers
• Biomedical Instrumentation
• Physiological Systems
• Selected Medical Diagnostic Techniques

YEAR 3 – FHEQ LEVEL 6
• Tissue Engineering
• Computer Aided Product Design
• Finite Element Method
• Research Project
• Engineering Management
• Mechanical Deformation in Structural Materials
•Implant and Prosthetic Technology
•Medical Engineering Group Design Project
•Biomedical Flows in Physiology and Medical Devices

YEAR 4 – FHEQ LEVEL 7
(MEng ONLY)
• Individual Research Project
• Numerical Methods for Partial Differential Equations
• Fracture and Fatigue
• Implant Engineering
• Simulation Based Product Design
• Strategic Project Planning
• Nanoscale Simulation
•Polymers: Properties and Design
• Medical Imaging

For the most up-to-date module information, access our course pages here: www.swansea.ac.uk/engineering/medical

CAREERS
Below is a list of typical career prospects for Medical Engineering graduates:
• Application Engineer in Medical Devices
• Bioinstrumentation Engineer
• Biomaterials Engineer
• Biomedical Engineer
• Clinical Engineer/Scientist
• Medical Physicist (requiring postgraduate degree)
• Medical Research Scientist
• Physician Associate (requiring postgraduate degree)
• Prosthetic Design Engineer
• Rehabilitation Engineer
• Robotic Surgical Instruments Developer

GET IN TOUCH
Email: engineering@swansea.ac.uk
Tel: +44 (0)1792 295514
swansea.ac.uk/engineering

All of our Engineering courses are ranked TOP 15 IN THE UK

The Times Good University Guide 2019

Here is a list of typical modules you will study during your degree:

BEng Medical Engineering
with a Year in Industry
with a Year Abroad
HB18
HB19
HB01

MEng Medical Engineering
with a Year in Industry
with a Year Abroad
HB1V
HB1W
HB02

TYPICAL OFFER:
ABB – BBB BEng
AAB – ABB MEng
(including Mathematical)
see website for further details

AT WORK WITH...
Gyan Bhatia
TECHNICAL SALES ENGINEER AND MANAGER, OXFORD INSTRUMENTS NANOSCIENCE

My role at Oxford Instruments NanoScience is a Technical Sales Engineer and Manager for UK, Ireland, France and Scandinavia. My role includes engineering consultation and design reviews, which include consulting on system concepts and requirements with academics on new and existing products.

The most advantageous thing I did at Swansea University is getting involved with lots of different things! Being a part of the rugby club exec, medical engineering society, representing my medical engineering cohort as a subject ambassador for open days.

I strongly believe the skills you learn in this element of the degree are highly transferrable into a professional company. Additionally, I made nice connections with different postgraduates, professors and researchers associated with my project, which helped me to get where I am today.
Engineering offers an enormous range of opportunities for graduates. If you do not have typical entry qualifications, or are an overseas student without the entry requirements for the first year, these four-year schemes are designed to provide wider access to accredited honours degrees.

The Foundation Year (Level 0) consists of 11 modules spread over two teaching blocks. Modules will include subjects in the following areas: mathematics, key skills for engineers, fundamentals of materials, thermofluid mechanics, structural petroleum and polymeric materials, optics and sound, electricity and magnetism and mechanics. The Foundation Year forms part of an integrated BEng degree scheme and is subject to the same undergraduate tuition fees. Transfer to MEng, Year in Industry, or Year Abroad schemes is possible during Level 2, provided you meet the minimum grade requirements in Y1-2.

Here is a sample of the topics you will study during your degree:

- Mathematics
- Key Skills for Engineers
- Fundamentals of Materials
- Thermofluid Mechanics
- Structural Petroleum and Polymeric Materials
- Optics and Sound
- Electricity and Magnetism
- Mechanics

CAREERS
Swansea graduates are consistently in high demand with engineering employers in all sectors. Our Foundation Year prepares you to enter onto any of our accredited undergraduate degree programmes. For examples of career opportunities for our graduates, take a look at the different courses on pages 26-39.

When you study in The College, you are a full student of the University from the start of your course. The College has an all new purpose built building located on the beachfront Bay Campus, the same campus as the College of Engineering. There is a new 411-bed student residence just for the students of The College, also located on the Bay Campus.

For the most up-to-date module information, access our course pages here: www.swansea.ac.uk/ engineering/foundation-year
WHAT’S NEXT?

After completing an Engineering degree at Swansea University, many students choose to continue their studies in order to maximise their earning potential and employability. Students who undertake a postgraduate degree realise personal and professional progression and gain valuable high-level skills sought after by employers, alongside an internationally respected qualification.

The College of Engineering offers multiple taught and research master degree programmes in Aerospace, Chemical, Civil, Computational, Electronic and Electrical, Materials, Mechanical Engineering, as well as Nanotechnology and Sport and Exercise Science.

Many of our students go on to study PhD or Engineering Doctorates, where they undertake projects with companies such as Rolls-Royce and Tata Steel.

97% of graduates in employment or further study within 6 months of graduating (DLHE)

FIND OUT MORE
For more information on postgraduate study please visit:
swansea.ac.uk/engineering

97% of graduates in employment or further study within 6 months of graduating (DLHE)

ENGINEERING SUMMER SCHOOLS

We run summer schools every year designed for year 12 students who are thinking about applying to university. They are residential courses which give an insight into all our courses and help students decide whether an engineering degree is likely to be for them. They usually run in July and you can register your interest in the summer schools throughout the year.

To find out more information, visit:
www.swansea.ac.uk/engineering/summer-schools
FREQUENTLY ASKED QUESTIONS

Q CAN I VISIT SWANSEA UNIVERSITY?
A Yes. We offer a number of Open Days throughout the year. In addition, we are happy to arrange independent visits. Just get in touch! We really encourage students and their parents/friends to visit us to get a feel for Swansea and the university. www.swansea.ac.uk/opendays

Q DOES THE COLLEGE OFFER PART-TIME OR DISTANCE LEARNING OPTIONS?
A We offer part-time options. However, all the courses are taught on campus. Distance learning is not available.

Q DO I NEED A-LEVEL MATHEMATICS?
A Students ask us this frequently. The answer is that some schemes do require Mathematics and others don’t. Materials Science and Engineering can be studied without A-Level Mathematics and can be an excellent choice for those looking for a slightly less mathematical engineering degree. The remainder of the schemes do require Mathematics to A-Level standard or equivalent. However, our integrated Foundation Year schemes are designed to allow students without Mathematics to study Engineering – it just means an additional year of study at university.

Q CAN I CHOOSE A YEAR IN INDUSTRY?
A Many of the courses offer the opportunity for a year in industry, which can be undertaken in the UK or overseas. In recent years, students have used this option to work or study in Europe, America or Australia. This will add a further year to the length of the programme.

Q SHOULD I CHOOSE A MEng OR BEng DEGREE?
A The prestigious MEng degrees demand higher entry qualifications, so you firstly need to see whether you can meet this. The MEng is a four year course, which covers every aspect of engineering to work in the engineering industry. MEng students typically go on to be influential engineers and managers, so the emphasis during the course is on team management and some very high-tech engineering skills based on our world-class research. An accredited MEng is the fastest way to achieve the educational requirements for Chartered Engineer status (CEng). However, the BEng degrees are often the most popular option and contain everything you need to know to be an engineer. Students can choose to take a further ‘matching section’ if they wish to apply to be a Chartered Engineer. It is worthwhile noting that it is perfectly possible to transfer onto (and off) the MEng programme, providing you meet the minimum average required in Y1-2 of your degree.

Q WANT TO FIND OUT MORE?
A If you’re a teacher, careers or education advisors, visit our website for more information on the resources available. We are happy to visit schools or colleges and give talks on a range of topics.