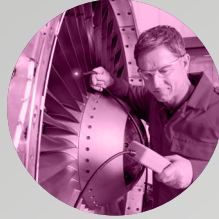


Discover a career path in

ENGINEERING



HEON
HIGHER EDUCATION
OUTREACH NETWORK

Aerospace Engineer
Chemical Engineer
Civil Engineer
Electrical Engineer
Mechanical Engineer

Materials Engineer
Software Engineer
Web Designer
Games Developer

This guide has been prepared for you to discover a range of different careers. Each of the pages outlines some key information about a particular career. If there is something of interest, we recommend using the information as a starting point and researching more online. Some suggested subjects to study are listed on each of the career pages. These are just ideas and exact entry requirements should be checked with each institution when applying. It should also be noted that most higher education courses will have a minimum GCSE requirement.

The Higher Education Outreach Network (HEON) is a partnership of local organisations including universities and colleges working in Surrey and Northeast Hampshire. The partnership is made up of the following institutions, many of whom offer courses that can lead to the careers listed in this guide:



Work experience can be a fantastic way to find out more about a job or industry you may be interested in. It's also a great way to gain and demonstrate experience for your future college, university, and job applications. It's worth reaching out to employers to ask about opportunities, and your school or college careers leader can help you with this.

HERE ARE SOME HELPFUL LINKS TO GET YOU STARTED:



AND YOU CAN ALWAYS LOOK AT VIRTUAL WORK EXPERIENCE OPTIONS TO COMPLETE AT HOME OR AT YOUR OWN PACE:



@HEONPARTNERSHIP
HEON@SURREY.AC.UK

So you want to be an **AEROSPACE ENGINEER**

Aerospace Engineers are responsible for some incredible concepts. Besides working on planes, these engineers work on the equipment required to make weather forecasts, mobile communications, television broadcasts and space flights. Aerospace engineering offers a range of fantastic and exciting opportunities.

SKILLS REQUIRED

- Knowledge of engineering science and technology
- Maths knowledge
- Design skills and knowledge
- Attention to detail
- Scientific knowledge

CAREERS THAT ARE AVAILABLE

With experience, you could specialise in a particular field like:

- Aerodynamics
- Fuel efficiency
- Space technology
- Investigating air accidents

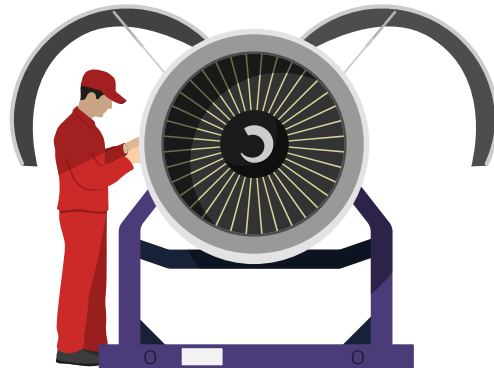
SUBJECTS TO CONSIDER TAKING AT SIXTH FORM OR COLLEGE

- Maths
- Physics
- Computer Science
- Design Technology

CHECK THESE OUT

Introduction to Flight
Textbook by John Anderson

Sustainable Energy – Without the Hot Air
by David J.C. MacKay



Average salary
£38,500
with a range from
£25,000 to £77,000
37-40 hrs a week

So you want to be a **CHEMICAL ENGINEER**

Applying science and technology to the development of solutions that improve our daily lives is at the heart of Chemical Engineering. From more efficient detergents and faster computers to more cost-effective drugs and safer air travel, Chemical Engineers make a tangible difference across a diverse range of industries.

SKILLS REQUIRED

- Maths knowledge
- Project management skills
- Knowledge of chemistry including the safe use and disposal of chemicals
- Design skills and knowledge
- Knowledge of physics

CAREERS THAT ARE AVAILABLE

- Design Engineer
- Research And Development Manager
- Plant Manager
- Operations Manager
- Consultant

SUBJECTS TO CONSIDER TAKING AT SIXTH FORM OR COLLEGE

- Maths
- Chemistry
- Physics
- Product Design

CHECK THESE OUT

Perry's Chemical Engineers' Handbook
Chemical Engineering: An Introduction
(Cambridge Series)



Average salary
£36,860
with a range from
£30,000 to £65,000
39-41 hrs a week



So you want to be a CIVIL ENGINEER

The work of Civil Engineers underpins the infrastructure of our society. Responsible for the design, construction and maintenance of the physical and built world – including our roads, bridges, waterways and buildings – Civil Engineers play an increasingly important role as we attempt to balance industrial growth with environmental protection.

SKILLS REQUIRED

- Report writing
- Knowledge of building and construction
- Knowledge of engineering science and technology
- Design skills and knowledge
- Critical thinking and analysis

CAREERS THAT ARE AVAILABLE

- Civil Engineer
- Project Manager
- Researcher
- Consultant

SUBJECTS TO CONSIDER TAKING AT SIXTH FORM OR COLLEGE

- Maths
- Physics
- Design Technology

CHECK THESE OUT

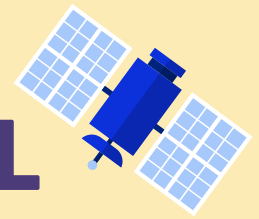
Civil Engineering: A Very Short Introduction by David Muir Wood

Think Like An Engineer by Guru Madhavan



Average salary
£45,000
with a range from
£30,000 to £70,000
40-42 hrs/week

So you want to be an ELECTRICAL ENGINEER



Whether it be sending a text or using satellite navigation, everyday tasks are made easier thanks to Electronic Engineers. Combining applied science with engineering design, Electronic Engineers are producing the next generation of computers, satellites and mobile phones.

SKILLS REQUIRED

- Project management skills
- The ability to multi-task
- Commercial awareness
- An analytical and problem-solving approach to work

CAREERS THAT ARE AVAILABLE

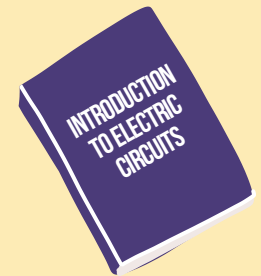
- Electrical Engineer
- Academic
- Contractor
- Consultant
- Project Manager

SUBJECTS TO CONSIDER TAKING AT SIXTH FORM OR COLLEGE

- Maths
- Physics
- Design

CHECK THESE OUT
Physics for Scientists and engineers -
Serway & Jewett

Introduction to Electric Circuits
by Richard C. Dorf



Average salary
£33,114
with a range from
£20,000 to £60,000
35-40 hrs/week

So you want to be a

MECHANICAL ENGINEER

The field of Mechanical Engineering is an exciting and dynamic one, involving the development of complex technology that drives aircraft, satellites, cars, production lines, construction machinery and medical equipment. A hugely broad area, Mechanical Engineers make possible the machines we use today and the robotics we will increasingly rely on tomorrow.

SKILLS REQUIRED

- Design skills and knowledge
- The ability to use, repair and maintain machines and tools
- Analytical thinking skills
- To be thorough and pay attention to detail
- Knowledge of physics

CAREERS THAT ARE AVAILABLE

- Mechanical Engineer
- Chartered Mechanical Engineer
- Business Manager
- Human Resources Officer

SUBJECTS TO CONSIDER TAKING AT SIXTH FORM OR COLLEGE

- Maths
- Physics
- Further Maths
- Design Technology

CHECK THESE OUT

Materials for the Engineering Technician
by R.A. Higgins

An Introduction to Mechanical Engineering
by Jonathan Wickert

6



Average salary
£32,158
with a range from
£20,000 to £52,000
36-40 hrs/week

So you want to be a

MATERIALS ENGINEER

Materials science and engineering is a cross-disciplinary subject that focuses on how materials behave and how their structure controls their behaviour. You will delve deeper into the relationships between fundamental science and how different groups of materials, such as ceramics, composites, metals, nanomaterials, textiles, and polymers, can be engineered to achieve better performance.

SKILLS REQUIRED

- The ability to work as part of a team as well as to take individual responsibility and make decisions
- Commercial awareness
- Knowledge of chemistry including the safe use and disposal of chemicals
- Knowledge of manufacturing production and processes

CAREERS THAT ARE AVAILABLE

- Materials Engineer
- Laboratory Manager
- Consultant
- Higher Education Lecturer

SUBJECTS TO CONSIDER TAKING AT SIXTH FORM OR COLLEGE

- Maths
- Physics
- Chemistry

CHECK THESE OUT

Stuff Matters: The Strange Stories of the Marvellous Materials that Shape Our Man-Made World
by Mark Midownik

The Material World
by Rodney Cotterill



Average salary
£39,956
with a range from
£20,000 to £45,000
39-41 hrs/week



7

So you want to be a SOFTWARE ENGINEER

From your morning alarm clock, to your vehicle of transportation or your mobile phone, software is all around us. Software engineers design and develop intelligent software that makes technology work.

SKILLS REQUIRED

- Knowledge of computer systems and technologies
- Technical competency
- The ability to communicate with clients, colleagues and Management to explain complex issues clearly and concisely

CAREERS THAT ARE AVAILABLE

- Software Engineer
- Senior Software Engineer
- Training Specialist
- Software Architect

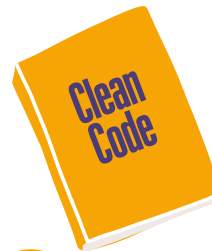
SUBJECTS TO CONSIDER TAKING AT SIXTH FORM OR COLLEGE

- Computing
- Physics
- Design Technology

CHECK THESE OUT Clean Code

by Robert C. Martin

The Changelog Podcast



Average salary
£38,891

with a range from
£18,000 to £70,000
39-41 hrs/week
(with the possibility of being on call)



So you want to be a WEB DESIGNER

Being a Web Designer is one of many careers which you could have after studying computer science. Our lives are affected by Computer Science every single day. From using our laptops to online shopping, watching TV and using a mobile phone, everything we touch is dependent on computing technology.

SKILLS REQUIRED

- Knowledge of computer operating systems, hardware and software
- High level of attention to detail
- The ability to write computer programs

SUBJECTS TO CONSIDER TAKING AT SIXTH FORM OR COLLEGE

- Maths
- Business
- Computing

CAREERS THAT ARE AVAILABLE

- Web Designer
- Graphics Designer
- Front End Developer
- Information Architect

CHECK THESE OUT

Daily Coding Problem

by Lawrence Wu and Alex Miller

The Search by John Battelle



Average salary
£23,857

with a range from
£18,000 to £40,000
37-39 hrs/week



So you want to be a **GAMES DEVELOPER**

Games development is a fast-moving, multi-billion pound industry. There are many stages, including creating and designing a game's look and how it plays, animating characters and objects, creating audio, programming, testing and producing.

SKILLS REQUIRED

- Design skills and knowledge
- A passion for gaming and an understanding of the different hardware platforms available for games
- Analytical thinking skills
- The ability to write computer code

CAREERS THAT ARE AVAILABLE

- Games Designer
- Lead Designer
- Games Consultant
- Games Design Lecturer

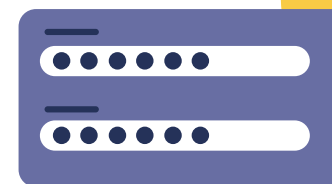
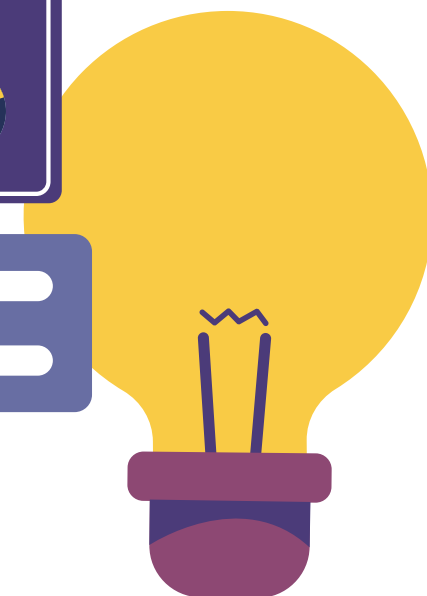
SUBJECTS TO CONSIDER TAKING AT SIXTH FORM OR COLLEGE

- Computing
- Maths
- Media Studies

CHECK THESE OUT

The Art of Game Design
by Jesse Schell

The Game Design Round Table Podcast



10

Average salary
£38,652
with a range from
£25,000 to £70,000
30-40 hrs/week

A circular purple bubble containing a stopwatch icon and a refresh arrow icon. A person is standing to the left, pointing towards the bubble.

There are multiple pathways you may wish to consider including apprenticeships, higher education courses and school leaver programmes.

If you are looking to apply to university HEON has prepared the following steps to support, you:



If you are considering applying for an apprenticeship a similar application process would be required however you would need to apply directly. You can find out more details about this and a wealth of other information on the HEON Hub at:



Student life STUDY TIPS



Charlotte - The University of Surrey

When it comes to studying, it is completely normal to lose motivation at times. Getting back into the swing of things after the holidays can sometimes be a lot easier said than done! As a second-year university student, I've experienced this feeling many times, through my GCSEs, A-Levels and even the last couple years of my degree. Here are a few tips and tricks I try to use when I need a motivation boost!

MAKE A TIMETABLE

Creating a plan is a very useful way of mapping out all the tasks you'd like to get done within a certain time frame. Whilst planning out my weeks, I try to divide big tasks into smaller, more manageable chunks and spread it out across the week, as being faced with a big lot of work in a short space of time can feel overwhelming sometimes.

START WITH THE TASKS YOU MOST ENJOY

After a period of rest from my studies, I've found that starting with work that is most interesting and enjoyable to me is a great way to get back into 'study mode', especially when I've lost a bit of motivation.

WORK WITH OTHERS

In general, I personally find studying with others around me, in places like the library or even a café, much more motivating than working alone. Setting up group video calls with friends is another way you can study together, from the comfort of your own houses.

TRY NEW REVISION TECHNIQUES

Something that I feel I am yet to master is finding that one revision technique that I use time and time again. Personally, I have found that if I continuously try to revise each topic in the exact same way, I quickly get bored and lose momentum. By trialling different ways of making my notes look pretty from time to time helps to keep me engaged and motivated to study! A few of my current favourite revision techniques include making flashcards on Quizlet and making A3 mind maps.

TAKE BREAKS!

Not many of us can concentrate on one thing for hours on end. Taking regular breaks during and between study sessions is so important, as making sure you are rested is key to producing great work.



If you have seen a career you would like to find out more about or would like to look at the full range of options then there is a wealth of information available online. Take a look at some of the links below to find out more.



WHERE DO I GO FROM HERE?

NATIONAL CAREERS SERVICE

Different pathways are explained on this interactive webpage.

HEON STUDENTS HUB

A wide variety of resources are available to look at a range of different pathways. There are also profiles from students at a range of Higher Education providers.

START PROFILE

Check out your options, complete activities to explore the world of work and improve your employability.

CAREERPILOT

A page packed with information about lots of different industries.

SUCCESS AT SCHOOL

Explore careers, get the lowdown on top employers, and search for the latest jobs, apprenticeships, courses and advice.

I THINK I MIGHT LIKE UNIVERSITY, BUT I DON'T KNOW WHERE TO START...

BRIGHT KNOWLEDGE

Tips on how to choose what to study both at school and university.

WHICH? UNIVERSITY GUIDE

A LEVEL EXPLORER

Put some subjects in and see what pops out - be sure to check the unexpected degree options.

MOVING FROM BTECS TO UNIVERSITY STUDY

Explore your options with BTEC studies.

CAREERPILOT

Packed with information about university, courses and additional info.

UCAS

Search through all university courses here.

WHAT UNI?

Compare university and degree courses with rankings, course details and profiles.

WHAT IF I DON'T THINK UNIVERSITY IS FOR ME?

APPRENTICESHIP FINDER

Search for different apprenticeships in a range of areas with a variety of providers.

AMAZING APPRENTICESHIP

Explore resources, research and apply to apprenticeships.

SKILLS FUNDING AGENCY

Find an apprenticeship guide, tips on applying and search for an apprenticeship here.

CAREERPILOT

Use the 'Get Info' menu to find out more about apprenticeships and work based learning.

STUDENT LADDER

Search over 2,500 positions for work experience, internships, apprenticeships and graduate schemes.

The information in the booklet has been collected from a range of sources and all information provided is correct at the time of printing (Jan 2023) and is subject to change without notice. Please do check all details when you apply for any courses.