Is Civil Engineering at the University of Birmingham for me?
‘The University of Birmingham is a brilliant institution with truly dedicated staff. Without the support of my lecturers and mentors I would not have realised my potential. They engaged not just me, but the entire year. It seemed there was nothing they did not know about civil engineering.

The School of Civil Engineering is a great place to study. The staff take a genuine interest in the students, providing support on all levels. Trust me when I say: if they can take me from my poor A-levels to a first class master’s degree, there is nothing they can’t do! All you have to do is be willing to meet them half way…’

Alex Heward
Graduated 2011

Read more about Alex later on...
So you want to be a civil engineer?

Civil engineering is an exciting and challenging career with many options

Perhaps you are interested in building things and are considering structural or geotechnical engineering. Maybe trains, cars and planes are your thing and you want to be a transport engineer. You might want to bring nature and humankind into greater synergy and are looking at environmental engineering, water resources engineering or even coastal engineering. Perhaps you want to help people in developing areas of the world and are considering earthquake or water engineering. Or, maybe you want to become an urban engineer and focus upon the complex challenges cities present. You may want to design new structures and processes as a design engineer, or work as a project manager.

Don’t worry if you don’t know right now what type of engineer you want to be. With a civil engineering course you can get the basics and decide later on.

Career prospects of a civil engineer

Engineering companies all over the world are in need of civil engineers to develop new technologies, build better buildings, create better cities, get people to where they want to go in the best way possible, and counter the devastating effects of climate change. In other words, to improve the future of the planet. This means that the civil engineers of tomorrow (you!) are in demand.

With a good education and a positive attitude you will be able to secure an exciting, well-paying job that offers you opportunities to work at the cutting edge of your field, all over the globe.

‘ON AVERAGE ENGINEERS GET PAID 15% MORE THAN AVERAGE, AND THIS RISES EACH YEAR’
Olympic Park: sustainability focus

The 2012 London Olympics were the most sustainable Olympics on record. Particular engineering challenges had to be overcome, such as how the park was built, how it operated and how people used it. The site on which the Olympic Park was built was in a state of disrepair that included land contamination from years of past industrial use that had to be cleaned up before anything else could be done.

Projects with which students and staff at the University of Birmingham have been involved

Key facts

The site is three square kilometers in size
The site masterplan and design began in 2003 and completed in 2011
Key planning strategies included flood risk reduction, water management and renewable energy
90% of the soil and materials at the site were either reused or repurposed
2,000 cubic kilometres of material had to be handled on the site, the equivalent to twice the volume of Lake Superior in North America
The remediation of the Olympic Park became the UK’s largest ever soil-washing operation
240 buildings were demolished
12 kilometres of highway were built
7 kilometres of waterways were rejuvenated
The total cost was £537 million
London Underground Crossrail Tunnel: construction focus

Crossrail is the longest tunnelling project in the world. Engineers have to contend with tunnelling through difficult London clay at distances never achieved before in that material, or any other for that matter.

Key facts

Crossrail is the first complete new London underground line in more than 30 years and is one of the largest single infrastructure investments undertaken in the UK.

Construction began in 2009. All tunnels are scheduled to be completed in 2017.

42 kilometers of new tunnels will be constructed below the busy streets of London.

Six Earth Pressure Balance Machines (EPB) and two Slurry Machines cater for differing ground conditions.

The diameter of Crossrail tunnels is 6.2 metres.

The cutter head diameter is 7.1 metres.

The typical progress rate is 100 metres a week.

A tunnel gang of 20 people work each Tunnel Boring Machine (TBM).

250,000 concrete segments will be used to line the 21 kilometers of twin-bore tunnels.

Concrete segments of 1.6 metres in width will be used to create the permanent tunnel walls. To create the curved tunnel the segments differ in shape.

Images courtesy of Crossrail.
Forth replacement crossing: design focus
The Forth Replacement Crossing is the largest infrastructure project in Scotland. It includes the Queensferry Crossing, a cable-stayed bridge of almost three kilometres in length, built when the existing Forth Road Bridge was discovered to have structural problems. Although primarily a transport project, the Queensferry Crossing is also a stunning design icon presenting engineers with the dual challenges of functionality and form.

Key facts
The Forth Replacement Crossing project (FRC) is the largest infrastructure project in Scotland for a generation

It is a vital project to the economy of Scotland, employing over 850 people on site and benefiting over 365 Scottish firms

The Queensferry Crossing is a 2.7 kilometre long cable-stayed bridge with three single column towers, wind shielding and two general traffic lanes with hard shoulders in each direction

The project is currently on schedule for completion in December 2016, under the original budget

Construction includes the world’s largest continuous underwater concrete pour for the foundations of the south tower, pouring 16,869 cubic metres of concrete

Images courtesy of Transport Scotland
New Street train station: redevelopment focus

New Street train station in Birmingham is being redeveloped into a new transport hub for the West Midlands. The new concourse will be three and a half times bigger than the old one and improved accessibility throughout the station is designed to improve the travelling experience for the 140,000 passengers who use the station every day. Pedestrian links and new entrances as well as a new public square will improve connections across the city, as will links with the city’s new metro system.

Key facts

The redevelopment of Birmingham New Street train station will deliver a station fit for Britain’s second city and transform the experience for the thousands of passengers who use New Street every day.

Preparatory work started in 2009, the first phase was completed in 2013, with the whole redevelopment to be completed by 2015.

There are 1000 workers on site, working 24 hours a day, 7 days a week.

The completed station will use 60% of the rainwater harvested from the stainless steel façade to flush all of the station’s toilets. Efficient water spray taps will conserve water and there will be natural daylight for the concourse and natural ventilation.

Images courtesy of Network Rail
What can I expect from the University of Birmingham’s course?

Our four-year undergraduate course will teach you about:
- Structural design and engineering
- Fluid mechanics and water engineering
- Geotechnical engineering
- Design and project management
- Maths and modelling of engineering problems

In addition you will have extra time to focus on areas that are of interest to you. You don’t need to decide until the end of your second year if you want to specialise.
‘The University offers a terrific variety of civil engineering programmes, so you can tailor your studies to suit your interests. You are given enough space in the syllabus to experiment and try new things, so take advantage of it! I remember thinking the group projects were a pain at the time, but looking back at them they were one of the best things I’ve done! Don’t pass up the opportunity to undertake laboratory-based projects and bring your competitive streak, as the bridge building contests make or break reputations. And don’t forget to get involved in student life. The University has great sporting facilities and endless societies to fit all interests.’

Yulia Makhover
Graduated 2011 (M.Eng. Civil Engineering with Business Management)
The University of Birmingham has something for every type of student, whether you are already top of your class with a clear idea of what you want to do, or you have struggled to find your form but are motivated to do your very best.

Mike wasn’t sure exactly what civil engineering involved when he signed up for an MEng at the University of Birmingham. He knew he was interested in becoming an engineer, but was worried his marks and varied schooling up to that point would hold him back. Mike enrolled in the foundation year and didn’t look back, graduating with a First and becoming a President’s Apprentice at the Institution of Civil Engineers.

‘Civil Engineering was different to what I expected because I did not understand the breadth of activity that occurs within the civil engineering industry. Although there are typically two major scopes of work (consultancy and contracting), the number of different opportunities and work environments within both areas is limitless.’

GCSE
Maths B
English Language & Literature B
Chemistry B
Biology B
Physics B
and 3 others

A-level
Maths
Physics
Music
General Studies to meet course requirements of ABB

‘It is a huge privilege for me to be a President’s Apprentice. As an apprentice I work on projects which will benefit civil engineers across the world. These are based on the Institution of Civil Engineer’s key themes of integrity, communication and engagement. It is a once in a lifetime opportunity’.

University
Foundation Year + MEng, graduated with a First

Current Role
Assistant Site Manager for McLaren Construction

What this involves
A mixture of management and technical engineering. Duties include programme building, programme management, subcontractor management, ensuring swift closure to any subcontractor disputes and a commercial responsibility for the performance of subcontractors.

Key Developments
President’s Apprentice at the Institution of Civil Engineers.
Laura was a star student before she joined the University, but the University still challenged her. She flourished at Birmingham, exploring every opportunity to gain more experience both in industry and at the University. After graduating with a First she was snapped-up by a world-class engineering consultancy firm.

**GCSE**  
Math A*  
English Language A  
Science Dual Award A*  
Science Dual Award A*  
and 6 others

**A-level**  
Maths B  
Physics A  
Biology B

**University**  
MEng, graduated with a First and a Certificate of Industrial Studies.

**Current Role**  
Graduate Engineer working for Arup, Solihull Office, Bridges and Civil Structures Department.

**What this involves**  
‘So far I have worked on the design of a 45 metre diameter ventilation shaft and fire escape for an underground railway in Hong Kong. I am currently involved in the decision process for the structural form of 13 new bridges for a UK highways project. I am also working on a plan for the demolition of a viaduct. Two days are never the same!’

‘Civil engineering is both an interesting and practical form of engineering full of exciting projects and with a very wide scope of future career options. Now I’m working in an engineering consultancy I am finding it very exciting to see what I have been producing on paper become a reality.’
Chris was another star student when he joined the University. Chris had a good grasp on what civil engineering involved and what his future career would be like, but the University of Birmingham still had plenty to teach him.

**GCSE**  
Math A*  
English Language A  
Science Dual Award A*  
Science Dual Award A*  
and 5 others

**A-level**  
Maths A  
Physics A  
Design Technology A  
History A

**University**  
MEng, graduated with a First

**Current Role**  
Geotechnical engineer for Atkins, Birmingham.

**What this involves**  
‘Most of my work is in the rail sector at the moment, including designing foundations for signal and overhead traction power masts, assessing and designing railway earthworks and designing bridge foundations. I have also been involved with designing marine and offshore structures for oil, gas and renewable energy clients.’

‘Civil engineering is not dramatically different from my expectations. I suppose the devil is in the detail. One of the most difficult, and most important, aspects of the job is translating analyses into the real-world – and vice versa. It is tremendously challenging to create something which is to brief, complies with regulations, fits within all the constraints and is built without unnecessary expense. This is something I’ve learned through my work experience at the University and now in my career.’
When Alex joined the University of Birmingham his GCSE and A-levels did not reflect his potential. He enrolled on the University’s foundation course, giving him an academic and personal boost that set him up to graduate with a First and join a leading construction company.

‘I’ve always wanted to be involved in the practical construction of the design on site. What I had not realised was the number and range of opportunities that existed in engineering. I’m currently an on-site contractor, which I love, and with the high demand for engineers and the terrific education I received at the University of Birmingham the possibilities to develop my career are very open.’

**GCSE**
- Geography A
- History B
- Maths C
- Double Award Science AA
- English C
- IT B
- Electronics B
- and 3 others

**A-level**
- Physics D
- Geography B
- Design & Technology B
- General studies C

**University**
- Foundation Year + MEng, graduated with a First
- Sponsored by Laing O’Rourke

**Current Role**
- Site engineer at the Oldham Town Centre Manchester Metro Link Project working for Laing O’Rourke.

‘My role demands flexibility, sometimes working nights, weekends and extended days to get the job done. It can be exhausting, but it is worth it!’

**What this involves**
- Coordinating subcontractors as well as setting out and controlling quality of the works produced. Reporting progress to senior staff and planning procurement to keep the project moving.
What qualifications do I need? / More info

Qualifications
A-levels
- Maths (you typically need to have an A), ideally including the Mechanics module
- Ideally a science, such as Physics
- And one other subject

Alternatives
- Alternative qualifications are possible and are considered on an individual basis.
- The University of Birmingham offers an excellent foundation year course, which gives you a way into civil engineering if you haven’t got the correct A-levels.

More info
If you are interested in finding out more about what civil engineers do, take a look at the other half of this booklet. This will give you more information on what being a civil engineer is all about. To find out what it is like being a Civil Engineering student at the University of Birmingham view our ‘day in the life of a civil engineering student’ video (http://tinyurl.com/birmingham-day-in-the-life).

If you are interested in studying Civil Engineering at the University of Birmingham get in touch! We can discuss what the course entails, provide you with a tour of the department and the campus and answer any questions you might have.

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For more information on the undergraduate civil engineering degree offered by the University of Birmingham go to www.birmingham.ac.uk/civil, where you can also request a school visit.

For more information about applying to study at the University of Birmingham go to www.birmingham.ac.uk and select ‘Undergraduate’ from the menu at the top of the page.

We look forward to welcoming you to the University of Birmingham!