UCL

IEP

Integrated
Engineering
Programme

To change the world, you need to be taught differently

UCL ENGINEERING
Change the world

In 1827, UCL founded the first laboratory in the world devoted to engineering education.

Nearly 200 years later, we are still at the cutting edge of the discipline.

Why UCL?

At UCL Engineering, we take people like you – who are bright, thoughtful and creative – and give them the skills and experience they need to engineer a better world.

We support our students to develop as individuals and follow their own intellectual interests, alongside providing the structure needed to develop a coherent body of expertise. **When you join us, you will develop your ability to design, analyse and innovate, by using your engineering knowledge to solve real-world problems in authentic interdisciplinary projects.**

What is the IEP?
The majority of undergraduate programmes at UCL Engineering follow a teaching framework – the Integrated Engineering Programme, or IEP – which will enhance your creative, analytical, teamwork, communication and interdisciplinary skills, all while you receive a thorough technical grounding in your chosen engineering discipline.

Why do we teach in this way?
The challenges of the 21st century require more than technical and theoretical knowledge to solve them. Today, more than ever before, engineers need to be able to design solutions that work for people in all kinds of different contexts across the globe. Creative problem-solving and multi-disciplinary teamwork are essential skills that can help communities tackle the complex problems in critical areas such as energy, infrastructure, security, health and sustainability. Our goal at UCL Engineering is to provide you with an excellent technical education, as well as the tools crucial for you to make the positive impact that will allow you and others to thrive in the future.

UCL Engineering is the faculty that changes the world. If simply recognising problems isn't enough for you, then why not create new opportunities and solutions by joining our global community of engineers?

IEP
Integrated Engineering Programme

IEP – Learn differently at UCL

UCL's Integrated Engineering Programme gives you the opportunity to put learning into practice by working in interdisciplinary, skills-based and design-focused environments. At its core, the IEP makes use of creative and stimulating aspects of research and design as practiced by industry engineers and computer scientists.

Programmes that follow the IEP produce well-rounded graduates who have an excellent grasp of the fundamentals of their discipline, and a broad understanding of the complexity of engineering. After all, there isn't one right way to solve engineering problems. That may sound scary, but our students feel like this is one of the best parts of being an engineer!

It's also why we believe our students need to tackle ambitious real-world problems, be sensitive to the social contexts of engineering, and develop crucial team working, leadership, management and entrepreneurial skills.

We're confident that this is the way engineering should be taught. But don't just take our word for it. **Cited as "an emerging global leader in engineering education" in a recent MIT report[1], and awarded the Higher Education Academy's Collaborative Award for Teaching Excellence[2], the IEP is recognised as the original integrated engineering teaching framework.**

How will I learn?

You will learn in a variety of ways. Some modules will be lecture-based, while some will be student-centred and thus provide you with the resources and support to self-study through video and written material, plus learn and analyse via real-world scenarios, peer assessment and tutorials. You may also have 'flipped lectures', (self-study via video and written material beforehand, so the time spent with your lecturer is more useful) and field trips.

Photo credit: Shaun Waldie photography

Additionally, you'll spend time in experimental or computer labs learning key technical skills. If your programme is part of the IEP, you'll get a unique opportunity to apply your technical knowledge through the process of engineering design, in a series of authentic team-based engineering projects.

Is the IEP for me?

- Are you interested in applied and industry-aligned engineering?
- Are you creative, or do you like working in creative environments?
- Are you interested in more than one area of engineering?
- Do you like working with people from different backgrounds and specialisms?
- Do you like communicating your ideas and solutions?
- **Do you want to change the world?**

If you answered yes to any of the above, the IEP is for you

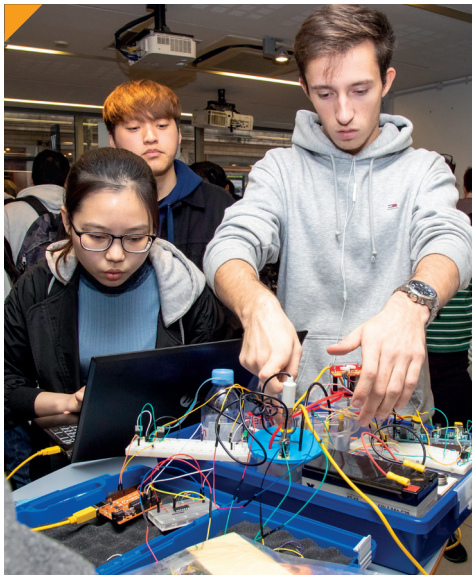
1 https://jwel.mit.edu/assets/document/global-state-art-engineering-education

2 https://www.heacademy.ac.uk/person/university-college-london-iep-team

Focused skills, for the real world and beyond

It takes more than just technical knowledge to make an impactful engineer. The analytical skills that studying engineering gives us are powerful, but on their own they're not enough. Interdisciplinary teamwork, communication and critical thinking are all vital. So is the ability to balance market opportunity with considerations of ethics, sustainability, and the law.

To really make a difference, you need to be able to understand the needs of your stakeholders. Engineers must take into account not just the technical feasibility of a proposal but its economic viability, social desirability, risk potential, environmental sustainability and ethical implications. Whatever decision you make, you need to be able to convince other people – bosses, sponsors, a community – that the decision is the right one and that work should go ahead.



How does the IEP help you achieve this?

Communication, creativity, teamwork and an awareness of the social context of engineering are professional skills that are integrated in and supported by all IEP modules and UCL Engineering programmes. By developing these areas, you will **become a better engineer and you will be more attractive to potential employers.**

You will develop your professional skills, typically, through Scenarios – week-long team projects when all your other lectures stop, and you can solely focus on your project; Challenges – two team projects that last for half a term each; and How to Change the World * – a two-week intensive, client-facing design project involving industry and government.

Some of these elements involve working with peers from your own cohort; some, including How to Change the World, involve working with students from across UCL Engineering, including students studying in the UCL School of Management. All three elements offer the opportunity to apply the skills and technical knowledge that you've learned in your core degree modules; giving you the experience of applying the theory and analysis with your own ideas to see how they work in practice.

You'll find out in more detail how Scenarios, Challenges and How to Change the World fit into the IEP curriculum and your specific degree programme timetable when you join us.

* Civil Engineering does not currently participate in How to Change the World

Disciplinary depth, interdisciplinary breadth

The majority of our undergraduate programmes follow the Integrated Engineering Programme (IEP) teaching framework. As a student on the IEP, you will study your chosen discipline in detail as the IEP philosophy introduces more opportunities to develop your professional skills and your chosen IEP Minor plus interdisciplinary projects with students from other engineering disciplines. This gives you a real advantage when entering your chosen field or a related area as a professional.

Civil Engineering, Electrical and Electronic Engineering and Mechanical Engineering students get to plan, design and swap ideas with their Biomedical Engineering, Chemical Engineering and Biochemical Engineering counterparts – as well as their Management Science and Computer Science peers.

How it works

The diagram below illustrates how the IEP elements fit within your core degree programme during your time with us. Please note that *Mechanical Engineering with Business Finance* does not have an IEP Minor option.

What is the IEP Minor?

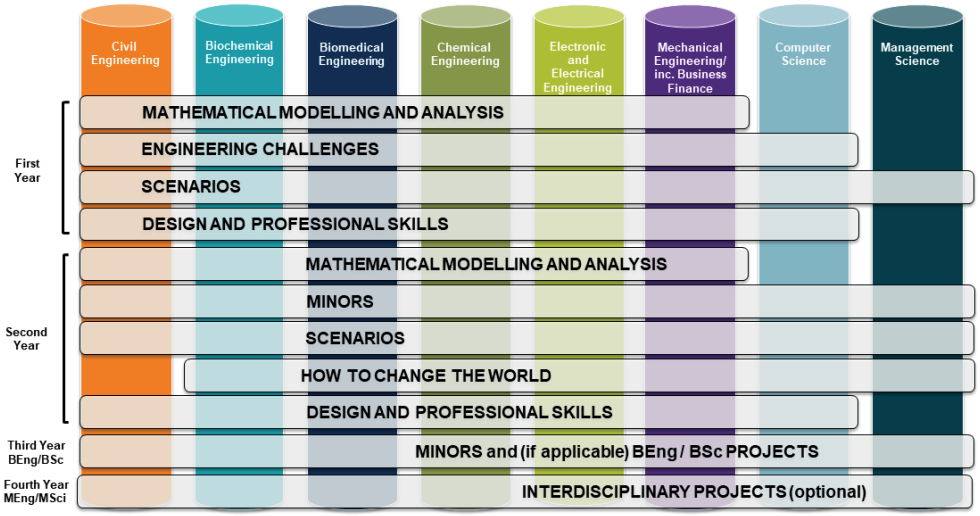
The IEP Minor is a set of three elective modules worth 45 out of 360 credits if you study for a BEng / BSc, or 45 out of 480 credits if you study for an MEng / MSci. You may choose either an alternative subject area or an advanced aspect of your current discipline. Either way, your degree title won't change.

What subject areas can I study?

IEP Minor topic areas are subject to change, but there are currently over 15 choices, including: entrepreneurship, programming, intelligent systems (AI), environmental engineering, maths and modern foreign languages.

Why is this part of the IEP?

Having knowledge of a new subject area, and experiencing interdisciplinary learning, allows you to **follow your passions and gain insight into engineering sectors that may be unfamiliar to you. It helps you stand out in a competitive job market, develop your confidence to work with others and explore new professional territories.**



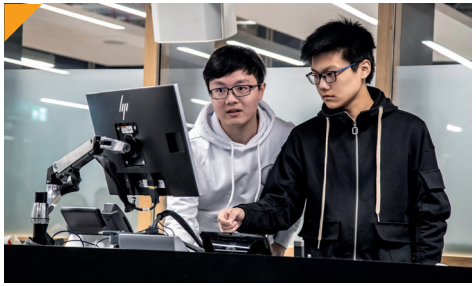
Simplified IEP Structure

Scope and exceptions

Most Undergraduate degrees within the UCL Engineering faculty follow the framework of the **Integrated Engineering Programme, and the key elements of learning will be fully integrated.**

Some UCL Engineering undergraduate degrees are not part of the IEP.

These exceptions (listed below) already have significant crossover with other departments or a strong employer connection.



- **Information Management for Business BSc**
- **Medical Physics BSc/MSci**
- **Mathematical Computation MEng**
- **Bioprocessing of New Medicines (Science and Engineering) BSc**
- **Bioprocessing of New Medicines (Business and Management) BSc**

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