

Cambridge
Programmes

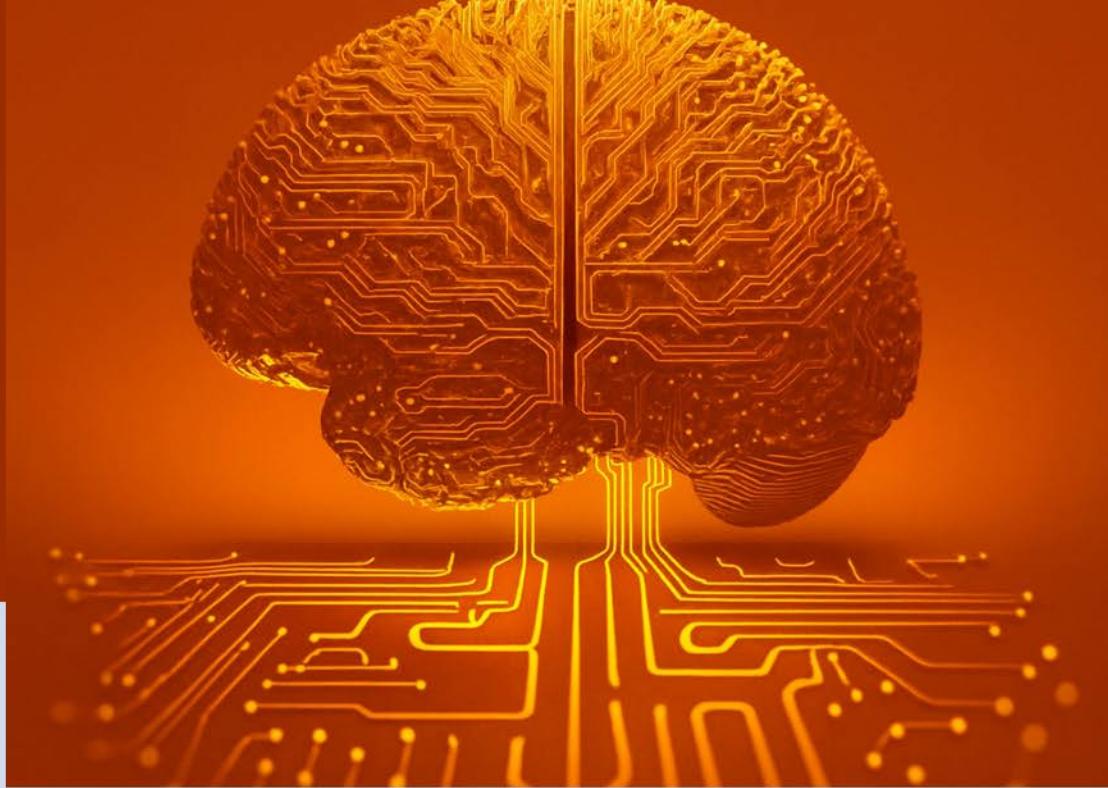


AI

Engineering AI
Programme



Venue: The Leys School, Cambridge, UK.



A Unique Experience for Future Engineers and Innovators

The Cambridge Engineering & AI Summer School is a two-week intensive programme designed to give students a taste of studying engineering and AI at university. Delivered by engineering students and graduates from the University of Cambridge, UK, the programme is rigorous, fast-paced and highly practical. It is intended for ambitious students who are seriously considering applying to engineering schools and want to prepare themselves with knowledge, skills and confidence.

Unlike other courses, this summer school goes far beyond lectures: students are introduced to real hands-on engineering challenges, cutting-edge AI applications, design competitions and world-class facility visits. Participants will be challenged to think analytically, solve problems creatively and collaborate effectively, developing the essential skills and confidence required for a strong foundation for future success at university.

Join us for an inspiring introduction to Engineering and Artificial Intelligence and a unique opportunity to experience the academic and technical excellence that defines the Cambridge tradition.

What makes the course unique?



Sessions are taught by leading engineers and educators from the University of Cambridge.

Mentorship from Cambridge students

Participants are accompanied by current University of Cambridge engineering students who provide supervision, teaching support and personal guidance throughout the course.

A true engineering school experience

From mechanical, electrical engineering to artificial intelligence, students learn in the style of a university engineering curriculum. A focus on core elements of engineering disciplines as well as emerging and exciting modules exploring how machine learning, robotics, and automation will shape the future of engineering and industry.

Hands-on and practical

Fun experiments, design challenges, robotics programming and real-world engineering simulations ensure students learn by doing.

Preparation for applications

Guidance on personal statements, interviews, and admissions, including insights into engineering entry pathways such as IB, A-levels, GCSEs (UK), HKDSE (Hong Kong), or alternative routes to study engineering at universities in the UK, Europe, USA and internationally.

Small supervision classes

Typically 5-8 students per mentor group, ensuring close supervision, mentoring and plenty of individual attention.

Evening sharing sessions

In addition to the indicative timetable below, there will be extra sessions from engineers, research scientists, professors and former engineering students, so that participants can meet those in senior academic positions and understand further the life of an engineering student, researcher, and practising professional in the UK.

Rigorous and rewarding

The programme is hard work, but students leave inspired and ready for the next stage of their journey, with a comprehensive understanding of the breadth of engineering careers and the practical skills to succeed at top universities.

Example Timetable

Day	Morning Session (09:00 – 12:30)	Afternoon Session (14:00 – 18:00)	Evening Session (19:30 – 21:00)
1	Introduction to the Programme	Admin Information Session	First Supervision
2	Mechanical Engineering	Introduction to AI	Guest Lecture
3	Computing History Museum	Study Skills	Supervision
4	Electrical Engineering	King's College Chapel	Technical Report Writing + Presentation Skill Workshop
5	Duxford Museum	Public Speaking	Soldering
6	Chemical Engineering	Public Speaking + Technical Report Activity Picnic by Cam River	Guest Lecture
7	Civil + Structural Engineering	Bridge Design Competition	AI Project Supervision
8	Engineering Department Tour	West Cambridge Tour	Interview Skills Workshop
9	Introduction to the Consultancy Project	Interviews + Feedback	Guest Lecture
10	Greenwich Observatory	The British Museum	Trip Highlights
11	Aerospace Engineering	Debating	Project Catchup Supervision
12	Project Live Demonstrations	Final Supervision	Formal Dinner





Example Sessions >

Soldering

Students learn essential soldering techniques by assembling real, working electronics projects they take home. Hands-on guidance covers safety, heat management and creating reliable joints. Working in pairs, students solder components onto PCBs to build functional radios or alarm clocks, understanding circuit design and electrical connections.

The workshop balances technical precision with creative problem-solving. Beyond practical skills, students experience the satisfaction of creating something tangible that works, demystifying electronics and inspiring confidence in hands-on engineering. Each student leaves with a functioning device they built themselves, a memorable keepsake demonstrating real engineering capability and sparking deeper interest in electronics and product design.

Bridge Design Competition

Teams of students engineer bridges using a secret material that force creative problem-solving while revealing structural principles. Given design briefs specifying span length, load capacity and aesthetic constraints, students sketch designs, calculate forces and construct scaled models.

The competition tests three criteria: load-bearing capacity, material efficiency and innovative design. Teams gradually add weights until bridges fail, encouraging iterative thinking and risk-taking. Beyond the competition, students analyse failure modes, understanding why real bridges use specific geometries and materials.

Walking around Cambridge's iconic bridges afterwards reveals how student-designed principles appear in the Mathematical Bridge, King's College Chapel flying buttresses and modern structures. This hands-on experience transforms abstract engineering concepts into visceral understanding, igniting appreciation for the invisible engineering marvels sustaining our built environment daily.



Picnic Activity

Students gather by the River Cam's iconic Backs for an outdoor "engineering journal club." In small groups, teams work on writing up a short technical report on a specific topic using formal and scientific language. Peers ask challenging questions while relaxing on the grass, mimicking how Cambridge students discuss research in college gardens.

The picnic setting removes presentation anxiety, encouraging authentic communication and peer learning. Between presentations, students explore Cambridge's engineering heritage visible from the riverbank: the Mathematical Bridge's elegant geometry, King's College Chapel's flying buttresses and punts navigating the waterway. This informal outdoor setting fosters genuine friendships, demonstrates that technical communication needn't be sterile and embeds students in authentic Cambridge academic culture where intellectual exchange happens naturally, whether in lecture halls or riverside gardens.

AI Project

Students identify real-world problems where AI can create positive impact. Working in teams, they formulate the problem, source publicly available datasets and train machine learning models using Python and Jupyter notebooks.

Through hands-on experimentation, students experience both AI's transformative potential and its limitations: data quality issues, bias in training sets and unexpected model failures. They learn ethical considerations: whose data are we using? Could this model harm marginalised groups? By designing solutions addressing real societal challenges rather than abstract problems, students grasp AI's profound power and responsibility.

Presenting their models to peers crystallises this understanding. They've wielded genuinely powerful technology and must think carefully about consequences. This project transforms AI from theoretical concept into practical tool for positive change.



Consultancy Project

Teams receive an open-ended brief. No detailed specifications are provided and students must define requirements, conduct research, identify constraints (budget, environmental, regulatory) and propose solutions.

Mentors play client roles, asking probing questions but offering no direction. This mimics real consultancy: graduates often inherit ambiguous problems requiring them to ask the right questions before designing. Teams must balance competing priorities, justify technical choices through analysis and present recommendations to "stakeholders." Through iterative problem-scoping, students learn that engineering excellence begins before calculations -- understanding the real problem determines solution quality.

They experience the messy reality of professional engineering: incomplete information, stakeholder disagreements and trade-offs between cost, performance and sustainability. This project develops judgment and professional thinking essential for engineering careers.

Skill Workshops

Dedicated skill workshops taught by mentors and programme directors equip students with capabilities that distinguish top candidates. Study skills training teaches efficient learning, exam strategies and timemanagement.

Presentation workshops build confidence articulating technical ideas clearly to diverse audiences, a skill engineers use daily. Technical report writing trains students to document engineering work professionally, translating complex concepts into precise, structured reports. Debate sessions develop critical thinking and ability to defend engineering decisions under scrutiny. Mock interviews, led by mentors familiar with university admissions and industry recruitment, demystify selection processes and reveal what interviewers assess: problem-solving approach, intellectual curiosity, resilience under pressure.

These workshops transform capable students into well-rounded candidates. Designed to train students in professional communication styles before high-stakes applications and interviews, significantly enhancing university admissions prospects and career readiness.

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Private applicants: please e-mail: info@cambridgeprogrammes.com for an application form

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