

UK G5 Academic Engineering Camp

"A Unique Study Tour – Explore Top Universities and
Immerse Yourself in Engineering Disciplines"

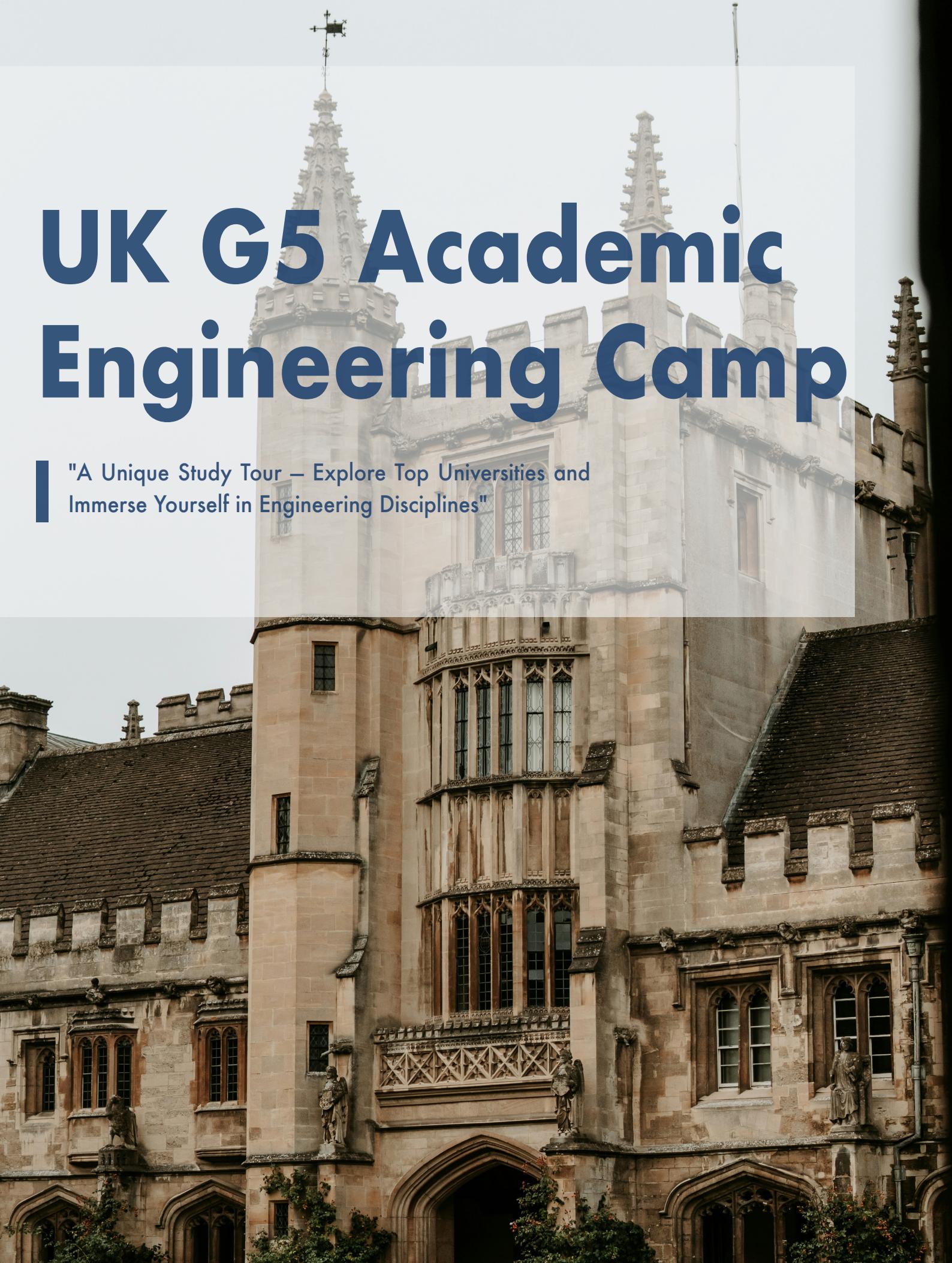


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Programme Introduction

This study tour program is designed for students aged 14-18 who are interested in engineering, mechanical design, and STEM disciplines. Over the course of two weeks, students will experience the academic atmosphere of world-renowned universities, learn fundamental engineering theories and skills, and participate in real-world engineering projects. They will also have the opportunity to meet like-minded peers. By independently completing related engineering projects, students can enhance their academic background and receive recommendation letters from top university mentors to support their college applications.

Why Join us

Teaching Outcomes and Expectations of the Camp

- 1** Focused on STEM Disciplines
- 2** Obtaining Research Experience by real, immersive Engineering projects
- 3** Presentation Skills, Teamwork and Leadership
- 4** Write Research Papers Based on Project Experience and Results, Enrich Your Resume



Programme Highlights



Experience Learning at Top Universities

Students will study and experiencing university life on the campuses of University College London and Imperial College London. Engineering professors will guide students through hands-on engineering projects.



Engineering Project Experience

The curriculum is designed according to the teaching methods used in university engineering programs, with a focus on hands-on practice. Students will enhancing their understanding of engineering disciplines and learning to apply theory to practice.



Comprehensive Skill Enhancement

Through teamwork, students will develop leadership skills, critical thinking, and time management, expanding their overall capabilities to become ideal candidates for top universities.



Cultural Exploration

In addition to academic learning and engineering project experiences, students will also visit the British Museum, London landmarks, and cultural sites, gaining a comprehensive understanding of British history and culture.



Teaching Methods and Schedule



09:30-12:30 Lecture

Theoretical Lectures



13:30-16:30 Workshop

Hands-on practice



20:30-21:30 Tutorial

One-on-one Q&A

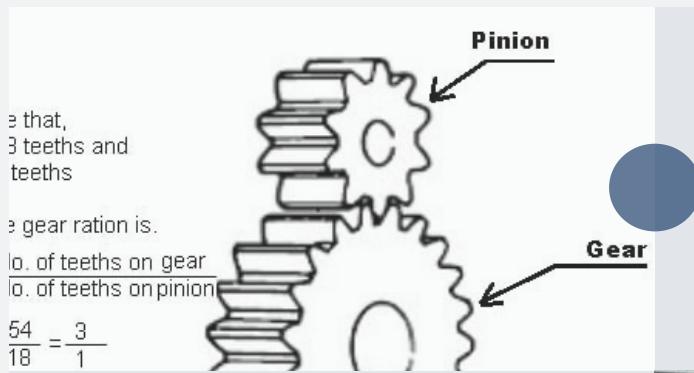
Our program adopts the British collegiate teaching model, combining lectures with small group personalized tutorials. Through bilingual (Chinese-English) instruction and highly interactive classes, students will immerse themselves in the learning environment and atmosphere of international universities. To ensure the completion and quality of the program, we integrate hands-on practice with theoretical learning, guiding students to understand, internalize, and apply knowledge flexibly.

LITERATURE



SPORTS

Teaching Content Coverage



Engineering

To help students understand the various stages of the engineering design process, including conceptual design, prototype, and realization, they will learn how to use CAD software for 3D modeling, optimize structural design through mechanics analysis, explore materials science and manufacturing processes, and apply power system theories to complete projects.



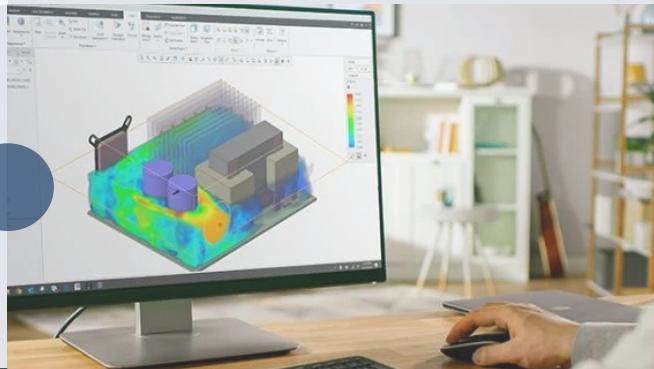
Programming

Starting with basic Python programming, the course covers fundamental programming syntax, data processing, design, and implementation. Through hands-on experiments and engineering applications, students will learn how to optimize engineering processes using programming, and how to use programming languages to automate tasks and control complex systems.



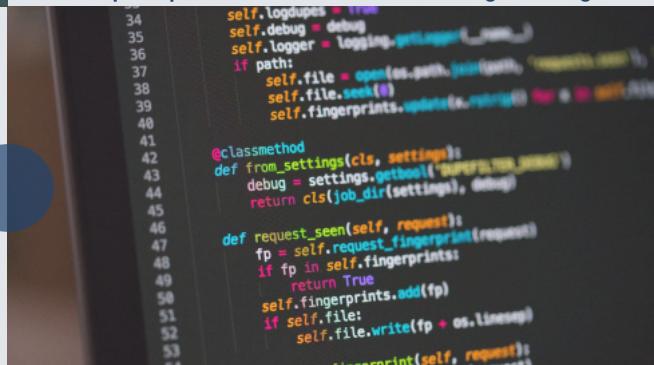
Physics

Our program focuses on the fundamental theories and applications of *classical mechanics, electromagnetism, and thermodynamics*. By studying concepts such as force analysis, the interaction of simple electric and magnetic fields, and the conservation of energy, we ensure that students can apply physical principles to solve real-world problems, particularly in engineering design and mechanical motion.



Mathematics

In addition to basic algebra, this project covers topics such as calculus, linear algebra, and probability theory. The course will delve into the applications of derivatives, integrals, and matrix operations in engineering, as well as the use of probability theory in data analysis. This will help students master the necessary tools to solve complex problems in science and engineering.



Business

In addition to exploring basic economic principles, marketing strategies, and supply chain management, the project will include market research and product analysis. This will help students understand business operations in a technical context, laying the foundation for future interdisciplinary collaboration.

Hands-on Project

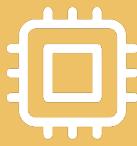
"External Pipe Climber "

----last year's programme



3D printing

By assembling a 3D printer, students will learn the basic principles of 3D printing technology, including how to convert digital models into physical prints. In the course, students will study material selection, parameter settings, and model design optimization, gaining proficiency in basic additive manufacturing techniques.



control system

This project focuses on the practical application of electrical and programming knowledge in mechatronic engineering. Students will first work on small circuit-building and programming projects, such as controlling a breathing LED light, and then move on to designing and implementing circuits and programs for robotic control systems.



Robot assembly

In this project, students will assemble a basic robot, learning mechanical structure design, transmission devices, and dynamic control. Through hands-on practice, students will experience how to integrate mechanical engineering with programming to build intelligent devices capable of performing specific tasks.



Test bench construction

Students will design and build a test bench based on real-world scenarios to test the mechanical systems they design or assemble. The course will teach experimental design, data collection, and result analysis methods, ensuring that students can optimize engineering solutions and solve problems based on experimental data.



Comprehensive ability improvement



Image source: UCL official website <https://www.ucl.ac.uk/>

Poster Design

The course will provide students with opportunities to deliver English presentations showcasing their project outcomes. Key topics include structuring the presentation, effective verbal communication techniques, engaging with the audience, and handling the Q&A session. Through multiple practice sessions, students will improve their English communication skills and public speaking abilities, boosting their confidence.



Image source: UCL official website <https://www.ucl.ac.uk/>

English Presentation

The course will provide students with opportunities to deliver English presentations showcasing their project outcomes. Key topics include structuring the presentation, effective verbal communication techniques, engaging with the audience, and handling the Q&A session. Through multiple practice sessions, students will improve their English communication skills and public speaking abilities, boosting their confidence.



Image source: <https://codakid.com/best-stem-competitions-events/>

Team Competition

In the project, students will participate in team-based competitions, working together to complete a full engineering project. From project planning, design, and development to testing, each team member will collaborate and contribute. At the end of the course, teams will present their project outcomes through poster displays and English presentations. The evaluation will focus on teamwork, technical innovation, and the successful completion of the project.

Engineering Camp Course Schedule

Date	Morning (9: 00-12: 00)	Afternoon (13: 00-16: 00)
1.12		Departure to London, UK
1.13	Opening Ceremony, Icebreaking Activity	Visit to University College London and Imperial College London
1.14	Project Introduction, Engineering Academic Paper Writing	Engineering Drawing Software Learning and Installation
1.15	Basic Physics/Mathematics Knowledge Lecture	Tuber Climber Design Theory, Subgroup Starts Structure Design
1.16	Design Evaluation, Subgroup Drawing of Self-Designed Parts	Printing Parts and Group Assembly
1.17	Printing Parts and Group Assembly Test	Basic Knowledge of Robot Control Systems
1.18	Road and Programming Project Practice	Pipeline Robot Control System Design
1.19	Group Assembly and Adjustment	Group Assembly and Adjustment
1.20	Visit to British Museum	Visit to Natural History Museum, Regent's Park Tour
1.21	Group Testing and Data Collection	Presentation Skills
1.22	Group Report Finalization, Completion of Experimental Report	Subgroup Quiz and Answering Competition
1.23	Graduation Ceremony, Closing Ceremony	Souvenir Purchase and Return Process

End-of-camp Feedback



Parent Feedback

Ms. Fu

thank you to all the teachers in the Engineering camp! Your support and guidance have meant so much to the kids. They not only grew from their mistakes but also learned responsibility and leadership through teamwork. Seeing them confidently present their designs made us so proud. This experience has been a huge help in shaping their future choices and solidifying their goals.

Ms. Zhou

Thank you to Ms. Rosy and all the mentors! This enhancement camp taught the kids so many practical skills and helped them clarify their future career paths. Through hands-on projects, they gained a deep understanding of the connection between theory and practice, building a solid foundation for future university applications. This experience not only boosted their academic abilities but also strengthened their teamwork and confidence.

Ms. Dong

This enhancement camp gave the kids a fresh perspective on engineering and helped them clarify their future career paths. Thank you to all the teachers for your hard work. The kids not only made great academic progress but also grew in confidence and teamwork. This experience has undoubtedly been a huge help for their future applications and career planning.

London city tour



Lecture



Oxford campus tour



Student Feedback



Zhang
26fall UCAL AP

Participating in the engineering camp was an unforgettable experience. From a professional perspective, I was involved in almost every step of creating the intelligent pipeline crawling robot. In addition to using modeling software and writing control system programs, I never realized before that engineers also need to consider the potential market and conduct consumer demand analysis. This time, we analyzed market needs and made innovations based on our original design, which left a deep impression on me. I wrote about this experience in detail in my application essays, and I believe it's the most helpful research experience for my application.



Zhu
AP

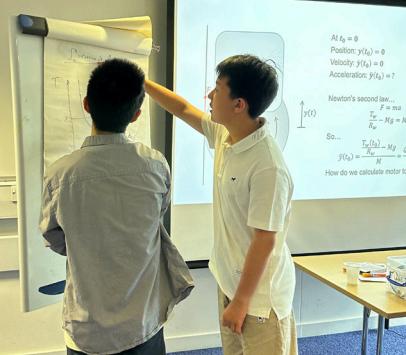
Every teacher in the engineering camp was incredibly dedicated, especially Mr. Eric. From him, I saw the qualities an engineer should possess. During the 3D printing process, I faced many challenges, and Eric often stayed up late with me to identify and solve problems. I truly admire him, and I'm striving to become an excellent engineer with the same perseverance and patience. After completing the crawling robot project, I also wrote a research paper under the guidance of the teachers, which enriched my activity and research experience, earning me greater recognition



Li
Gao Kao

Before joining the Engineering camp, I was quite uncertain about my future major because I had little exposure to engineering. However, through the activities in this camp, I realized that I want to pursue Electrical and Electronic Engineering. The control systems and the breathing light project we worked on sparked my interest. My English skills also improved significantly. The English classes and frequent discussions with classmates in English greatly enhanced my speaking ability. Although the final English presentation was a big challenge for me, I'm proud to say that I completed it successfully, which made me more confident and willing to express myself.

Q&A



Presentation



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Circuit Building



Campus environment



Q&A

Emergency Situations

- In the event of an accident or emergency, our team is capable of responding and ensuring that participants receive appropriate support. If a participant needs to go to the hospital, a staff member will accompany them, and parents/guardians will be contacted as soon as possible. For any other emergency, we will contact the appropriate emergency services and notify the parents/guardians promptly.

Dietary Requirements

- Breakfast, lunch, and dinner are provided by the catering team that serves students during the academic term. The staff is familiar with various dietary requirements and will be happy to recommend suitable meals for you. If you have any food allergies, please speak with the staff to confirm allergens as an additional precaution.

Campus Security

- The school's main entrance is monitored 24/7 by school staff. Many public areas on-site are equipped with CCTV, and public visiting hours are limited. The accommodation is very secure and private. Participants will receive a key and are encouraged to lock their bedroom doors during the day. Housekeeping staff will enter the rooms during the day to replace towels and perform other tasks.

