IMPERIAL

Imperial Summer Programme
Introduction to Sustainable Development and Its Engineering Practice

21/07/2025-01/08/2025 at Imperial College London

IMPERIAL COLLEGE LONDON

Consistently rated amongst the world's best universities (1st in Europe and 2nd in World, QS World University Rankings 2024), Imperial College London is a science-based institution with an international reputation for excellence in teaching and research. Imperial attracts over 22,500 students and 8,000 staff of the highest international quality from over 126 different countries.

Since its foundation in 1907, Imperial's contributions to society have included the discovery of penicillin, the development of holography and the foundations of fibre optics. This commitment to the application of research for the benefit of all continues today, with current areas of focus including interdisciplinary collaborations to improve global health, tackle climate change, develop sustainable sources of energy, address security challenges, develop data management and analysis technologies for supporting data driven research, and tackling problems at molecular scale.

Imperial's Professional Development and Summer Programmes Unit within the Institute of Extended Learning had extensive experience in developing and running a range of programmes for undergraduate students. We draw on Imperial's education pedagogy to design and deliver programmes that provide an engaging learning experience for students, incorporating group projects that are designed to assess students' learning outcomes.

Department of Electrical and Electronic Engineering

The home of EEE is a dedicated 12-storey tower at the heart of the South Kensington campus, and our community numbers around 1,200 staff and students. Our reputation is built by our people and our culture, and we're focused on ensuring our department is a welcoming, inclusive, diverse and positive environment in which to work and study.

Our department has a long and proud history of world-class research and innovation, with our origins dating back to the 1870s.

Electrical and electronic engineering underpins most of the key technologies of the modern world, and we are at the forefront of tackling the most urgent global challenges in energy, healthcare, security, smart technology and communications.

Our research targets both the fundamental advances and the practical applications of science and technology, and our engineers research across the breadth of fields in electrical and electronic systems and information science. We have a collaborative and inter-disciplinary approach to research across Imperial and beyond, including the Imperial Centre for Quantum Engineering, Science and Technology and the KIOS Research and Innovation Centre of Excellence.

PROGRAMME OVERVIEW

This programme is designed to develop the next generation of leaders for the energy and digital transition by providing grounding in the major features of global energy issues, sustainable energy technologies and their interactions with economics, the environment and policy. Taking a quantitative approach to the study of technology and systems, the programme mainly, though not exclusively, attracts students from engineering and physical sciences. It also appeals to those with some post degree experience wishing to gain a broader, more strategic perspective of energy issues.

Team-based learning through group project:

Students will be working in small teams on a group project as outlined below:

The project aims to design a sustainable university campus by reducing environmental impact and promoting eco-friendly practices. The team will focus on energy efficiency,

waste reduction, and green infrastructure. Key initiatives may include developing renewable energy solutions (e.g., solar panels), implementing a campus-wide recycling program, and creating green spaces to enhance biodiversity. The project can also explore water conservation strategies and sustainable transportation options like bike-sharing programs. By engaging students and staff in sustainable practices, the aim is to reduce the campus's carbon footprint and inspire broader environmental responsibility within the community.
Supervised by Imperial staff members through tutorials, students will present the project to a panel of experts on the last day of the programme.

The programme will cover the following core lectures:

- Introduction to Sustainable Development
- Introduction to Entrepreneurship
- Data Science and Digitalisation for Sustainability
- Smart Grids
- Low-carbon Energy Systems
- Life-cycle Assessment for Sustainability
- Group Project Introduction and Briefing
- Advances in Sustainable Energy
- Professional skills workshops to include:
    - Team building and leadership.
    - Effective Communication for Presentation.

Social activities will include:

- Welcome lunch and campus tour with Imperial student ambassadors.
- Thames River Cruise.
- British Cultural Quiz.
- Visit to Bletchley Park.
- Tour of the Royal Albert Hall.

Learning objectives:
On completion of this programme, students will be able to:

- Understand the basic concepts of Sustainability.
- Develop an understanding on the role of energy systems in Sustainability.
- Establish an understanding of entrepreneurship for Sustainability.
- Understand the importance of digitalisation in Sustainability.
- Gain a unique insight into advances in Sustainability.
- Develop valuable professional skills in teamwork, communication and presentation.
- Experience team-based learning through a technical project.
- Practice and improve their English language.

In addition, students will have an opportunity to make new friends, get to know student ambassadors from Imperial College London through social activities and discuss opportunities for future study and experience what it is like to study in a world class university.

PROGRAMME STRUCTURE AND FORMAT

56 contact hours spread over 2 weeks covering lectures, workshops, tutorials, project work and visits. Classes will be delivered on weekdays.

Students will be allocated in small groups for Project work which will be done through team-based learning with supervision. Final project will be presented in groups to a panel of experts on the last day of the programme. A prize will be awarded to the team with the best project. The entire programme will be taught in English. Tentative programme is attached in the end.

CERTIFICATION

Students will receive a verified Imperial College London **certificate** on successful completion of the programme and a **prize** will be awarded to the best project teams. Each student will also receive a **transcript** for their project marks.

FEES

The 2025 programme fee is **£3,000**. Please note, the programme fee is non-negotiable, and the programme fee will cover:

- All tuition;
- Course materials, such as building materials, lab supplies and protective equipment;
- Masterclasses;
- Use of campus facilities, such as sports hall, classrooms and catering facilities;
- Induction and orientation activities;
- Certificate of participation on completion of the Summer School, awarded by Imperial;
- Finale celebrations;

ENTRY REQUIREMENTS

All students are expected to be studying an undergraduate degree, preferably in the final two years of their undergraduate studies, in any engineering disciplines.

English requirements:

All students are required to have a good command of English, and if it is not their first language, they will need to satisfy the College requirement as follows:

- a minimum score of IELTS (Academic Test) 6.5 overall (with no less than 6.0 in any element) or equivalent.
- TOEFL (iBT) 92 overall (minimum 20 in all elements)
- CET- 4 (China) minimum score of 550
- CET- 6 (China) minimum score of 52

TEACHING FACULTY

The programme is directed by Dr Fei Teng taught by a multi-disciplinary teaching faculty from the Department of Electrical and Electronic Engineering and other departments of Imperial, e.g.

- Prof Tim Green, Fellow of the Royal Academy of Engineering
- Prof Peter Childs, Fellow of the Royal Academy of Engineering
- Prof Mark O'Malley, Foreign Member of the US National Academy of Engineering
- Prof Bikash Pal, Fellow of the Royal Academy of Engineering
- Prof Goran Strbac, Chair in Electrical Energy Systems

LOCATION

The programme will take place at Imperial College London's South Kensington Campus, located amongst many famous attractions in London.

The culture triangle: neighbour to three of London's most prestigious (and free) museums. Right next door, the Science Museum. Across the road, the Victoria & Albert Museum, and around the corner? The Natural History Museum. From Neolithic to the latest scientific breakthroughs, experience it all just minutes from Imperial's doorstep.

The campus is also next to the famous Royal Albert Hall, one of London's most iconic music venues, established in 1871, host to the BBC Proms and countless world-famous international artists.

In addition, the beautiful Hyde Park and the famous Harrods Department Store are just a short walk from the campus.

TENTATIVE PROGRAM:

Week 1:	
Monday	
08:30	Programme Registration
09:00	**Welcome, Housekeeping and Introduction to Imperial**
09:15	**Programme Overview**
09:30	**Lecture (1)**
12:00	**Group Project Briefing and Planning**
12:30	**Group Photo**
13:00	**Welcome lunch with student ambassadors followed by Campus Tour**
14:00	**Professional skills workshop - Team Building and Leadership**
17:00	End of day
Tuesday	
09:30	**Lecture (2)**
12:30	Lunch
13:30	Project tutorial
14:30	Teams work on group project
16:30	End of day
Wednesday	
09:30	**Lecture (3)**
12:30	Lunch
13:30	**Social activity with student ambassadors**
	Thames River Cruise
16:30	End of day
Thursday	
09:30	**Lecture (4)**
12:30	Lunch
13:30	Project tutorial
14:30	Teams work on group project
16:30	End of day
Friday	
09:30	**Lecture (5)**
12:30	Lunch
13:30	**Relevant visit or Career workshop**
16:30	End of day

Week 2:	
Monday	
09:30	**Lecture (6)**
12:30	Lunch
13:30	**Professional skills workshop - Effective Communication for Presentation**
16:30	End of day
Tuesday	
09:30	**Lecture (7)**
12:30	Lunch
13:30	Project tutorial
14:30	Teams work on group project
16:30	End of day
Wednesday	
09:30	**Lecture (8)**
12:30	Lunch
13:30	**Social sightseeing activity with student ambassadors** **Tour of the Royal Albert Hall**
16:30	End of day
Thursday	
09:30	**Lecture (9)**
12:30	Lunch
13:30	Project tutorial
14:30	Teams work on group project
16:30	End of day
Friday	
09:00	**Students arrive to upload project presentations**
09:30	**Group 1**
09:45	**Group 2**
10:00	**Group 3**
10:15	**Group 4**
10:30	**Group 5**
10:45	Break
11:00	**Group 6**
11:15	**Group 7**
11:30	**Group 8**
11:45	**Group 9**
12:00	**Group 10**
12:15	Presentation ends Students to complete feedback form
12:45	Lunch
13:45	**Opportunites for International Students**
14:45	**Award ceremony and annoucement of winning project team**
15:45	Close of summer school and students depart