

A photograph of a grand, classical-style building with multiple stories, arched windows, and a prominent entrance with columns. The building is made of light-colored stone. In the foreground, a paved walkway leads to the entrance, and a green lawn is visible on the right. Three women are walking on the path towards the left, and two other people are standing near the entrance on the right. The sky is blue with some clouds.

CARDIFF  
UNIVERSITY

PRIFYSGOL  
CAERDYDD

**International Summer Schools  
College of Physical Sciences and Engineering**

# Welcome

## The College of Physical Sciences and Engineering is a vibrant and international community, committed to tackling global challenges and providing an enriching student experience.

We are part of an innovative university that has both a long history of teaching and research, and ambitious plans for the future. We are also pleased to be based in a beautiful and vibrant capital city.

Our research was recently ranked 5th among UK universities for its quality in the 2014 Research Excellence Framework, and 2nd for its impact. A large proportion of our research was named world-leading or internationally-respected.

We provide our students with opportunities to learn from, and engage with, inspirational academic scholars and researchers, and be part of an internationally inclusive and diverse student experience.

Each of our four Summer Schools aims to develop a sophisticated knowledge of the subject area, provide hands-on experience, and give students an insight into life at a leading university in the UK.

We have a track record of educating talented, highly skilled individuals who go on to make an impact throughout the world. We are excited to be continuing our track record with this year's International Summer Schools.

Join us and discover how Cardiff University can help you realise your potential.

**Professor Karen Holford FEng, FLSW, CEng, FIMechE**, Pro Vice-Chancellor,  
College of Physical Sciences and  
Engineering



# The Welsh School of Architecture's Low Carbon Architecture Summer Programme

**The Welsh School of Architecture is consistently ranked as one of the top architecture schools in the UK. In 2015, the School was ranked 29th in the QS World University Rankings for Architecture, and many of our academics are world-leaders in their field.**

The Low Carbon Architecture Summer Programme brings together advanced undergraduates and recent graduates from around the world to develop their knowledge of low-carbon design whilst experiencing the culture of the UK.

The programme engages students in interactive and inspiring seminars, lectures and project work, as well as field trips and excursions to low-carbon showcases and other sites of interest in nearby areas. You will be able to learn about the latest developments in low carbon design, and gain practical hands-on experience in design of the built environment.

Our strong industrial partnerships allow us to find sustainable solutions to real-world problems and help to maximise the impact of our research.

We provide our students with opportunities to learn from, and engage with, inspirational academic scholars and researchers and be part of an internationally inclusive and diverse student experience.

We're proud of our record of educating talented, highly skilled individuals and of the contribution our graduates are making throughout the world.

## Here's what our past students have said about the programme:



*"It's been an amazing experience attending the sustainable architecture workshop in Cardiff – it's a great exposure for students and architects worldwide."*

– Bindu Lankesh, India

*"Very interesting and educational. We had a great time."*

– Amira Raneem Shehab, Lebanon



*"International interactions are really beneficial for students looking to enhance their careers."*

– Sherin Gammaz, Egypt

*"Really great, this is the perfect experience."*

– Qian Wu, China





## Low Carbon Architecture Summer Programme preliminary schedule (subject to change):

<b>Saturday 9th July:</b>	Arrival in Cardiff
<b>Sunday 10th July:</b>	Free time
<b>Monday 11th July:</b>	Welcome meetings and lectures
<b>Tuesday 12th July:</b>	Visit to St Fagans National History Museum and 'House for the Future'
<b>Wednesday 13th July:</b>	Tutorial on site, context and climate
<b>Thursday 14th July:</b>	Visit to the BRE Innovation Park
<b>Friday 15th July:</b>	Tutorial on building form and envelope
<b>Saturday 16th July:</b>	Daytrip to Stonehenge
<b>Sunday 17th July:</b>	Free time
<b>Monday 18th July:</b>	Model making workshop
<b>Tuesday 19th July:</b>	Visit to London Crystal
<b>Wednesday 20th July:</b>	Model explorations in the artificial sky dome; tutorial on building design and materials
<b>Thursday 21st July:</b>	Preparation for project presentations
<b>Friday 22nd July:</b>	Project presentations and reviews / Gala Dinner
<b>Saturday 23rd July:</b>	Departure

# Cardiff University School of Engineering's Electronic Engineering Summer Camp

**Cardiff University School of Engineering is one of the oldest, largest and most respected engineering schools in the UK. Recently, we were ranked as the top university in the UK for the impact of our research. We have over 100 academic staff in the School, many of whom are conducting world-leading research.**

Our Electronic Engineering Summer Camp brings together advanced undergraduates and recent graduates from around the world to develop their knowledge of electronic engineering and to gain first-hand experience of laboratory work and industrial application.

Participants will be able to work with world-leading research and academic staff from in the School's high-quality facilities, located in the multi-million-pound Queen's

Buildings complex. You will also have the opportunity to take part in a workshop with National Instruments, the global leader in test, measurement and control solutions.

Throughout the two-week long camp, there will be other planned excursions and free time included in the schedule for participants to explore Cardiff, get a feel for life in the UK and socialise with each other.

**Teaching on the course will be led by: (click photo for staff member profile).**

Professor Johannes Benedikt

Professor Paul Tasker

Professor David C. Jiles

Professor Adrian Porch



# Electronic Engineering Summer Camp preliminary schedule (subject to change):

**Saturday 9th July:** Arrival in Cardiff

**Sunday 10th July:** Free time

**Monday 11th July:** Welcome talk and social event

**Tuesday 12th July:** Lecture: What are mobile communications?  
Build a freestanding mobile system transmitter tower  
Laboratory session

**Wednesday 13th July:** Lecture: Interdisciplinary uses of microwave sensors and actuators  
Lecture: Radio communication, modulation and detection  
Laboratory sessions

**Thursday 14th July:** Lecture: Mobile base station power amplifiers  
Laboratory sessions

**Friday 15th July:** Lecture: Information theory, encoding and networks  
Laboratory sessions

**Saturday 16th July:** Field trips and free time

**Sunday 17th July:** Field trips and free time

**Monday 18th July:** Lecture: The development of active harmonic load-pull and the development of RFPAs  
Laboratory sessions

**Tuesday 19th July:** Industrial site visit

**Wednesday 20th July:** Lecture: RF I-V waveform measurement and engineering  
Tour of School research laboratories  
Free time and social event

**Thursday 21st July:** Hands-on laboratory with National Instruments

**Friday 22nd July:** Lecture: What is engineering?  
Barbecue

**Saturday 23rd July:** Departure from Cardiff



# Cardiff University School of Engineering's Power Systems Summer School

**The Power Systems Summer School gives recent graduates and advanced undergraduates from across the globe the chance to learn from internationally recognised academics in high-quality facilities. Participants will be able to develop both their practical skills and their knowledge of engineering, through a mixture of lectures and hands-on activities.**

The programme content will include an opportunity to design and build your own transmission tower, under guidance from our academics and researchers. You will also receive demonstrations of software such as Neplan load flow software and EMPTP/ATP.

The course also includes planned excursions to industrial sites, in addition to other areas of interest. There will also be scheduled free time for participants to be able to explore Cardiff, socialise with each other, and experience life in the UK.

Teaching on the course will be led by: [\(click photo for staff member profile\)](#).

Professor Manu Haddad

Professor Jianzhong Wu



# Power Systems Summer School preliminary schedule (subject to change):

<b>Saturday 9th July:</b>	Arrival in Cardiff
<b>Sunday 10th July:</b>	Free time
<b>Monday 11th July:</b>	Welcome and orientation day
<b>Tuesday 12th July:</b>	Lecture: Setting the scene – The UK power industry and National Grid Software demonstration: Neplan load flow software 'Design Challenge 1': Design, model and build a transmission tower
<b>Wednesday 13th July:</b>	Lectures: The per unit system, Reactive power, Line parameters Software demonstration: EMTP/ATP 'Design Challenge 2': modelling of transients in EMTP
<b>Thursday 14th July:</b>	Lecture: Electrical machines Laboratory session Submission of 3D-printed model of transmission tower
<b>Friday 15th July:</b>	Tour of the High Voltage Laboratory and Lightning Laboratory Research Presentations by Dr. David Clark and Professor Manu Haddad
<b>Saturday 16th July:</b>	Field trips and free time
<b>Sunday 17th July:</b>	Field trips and free time
<b>Monday 18th July:</b>	Lecture: Transformers Tour of the Wolfson Centre Laboratory session
<b>Tuesday 19th July:</b>	Industrial site visit
<b>Wednesday 20th July:</b>	Lecture: Transmission lines Laboratory session Work on presentations for Design Challenges
<b>Thursday 21st July:</b>	Lecture: Protection in Power Systems Laboratory: Relay protection on distribution networks Present work on Design Challenges
<b>Friday 22nd July:</b>	Closing presentation and gala dinner, including prize-giving ceremony
<b>Saturday 23rd July:</b>	Departure from Cardiff



# Cardiff University School of Chemistry's International Summer Camp

**Cardiff University School of Chemistry is one of the most respected chemistry departments in the UK, with 95% of our research recently judged as internationally excellent or world-leading. Our facilities have received £14 million of funding in recent years, and we are now home to the Cardiff Catalysis Institute.**

Our Chemistry Summer Camp is a great opportunity for advanced undergraduates and recent graduates from around the world to gain first-hand experience of laboratory activities, advanced analytical techniques and industrial visits. Participants will get to work with world-leading research and academic staff from Cardiff University School of Chemistry.

Focus areas for the Summer Camp will include catalysis, biological chemistry, spectroscopy, and computational chemistry, in addition to other topics.

Participants will also benefit from experiencing the culture of Cardiff and the UK through organised field trips and scheduled free time, as well as being able to experience university life in the UK.





## Cardiff University School of Chemistry's International Summer Camp preliminary schedule (subject to change):

<b>Saturday 9th July:</b>	Arrival in Cardiff
<b>Sunday 10th July:</b>	Free time
<b>Monday 11th July:</b>	Welcome and orientation day
<b>Tuesday 12th July:</b>	Inorganic/Organic Synthesis Laboratory Lectures
<b>Wednesday 13th July:</b>	Inorganic/Organic Synthesis Laboratory Lectures Industrial visit
<b>Thursday 14th July:</b>	Biological Chemistry Laboratory Lectures
<b>Friday 15th July:</b>	Scenic tour of Welsh beaches
<b>Saturday 16th July:</b>	Field trips and free time
<b>Sunday 17th July:</b>	Field trips and free time
<b>Monday 18th July:</b>	Tour of Cardiff Catalysis Institute Lectures
<b>Tuesday 19th July:</b>	Computer Modelling Laboratory Lectures
<b>Wednesday 20th July:</b>	Catalysis Laboratory Lectures Industrial visit
<b>Thursday 21st July:</b>	Spectroscopy Laboratory Lectures
<b>Friday 22nd July:</b>	Course conclusion
<b>Saturday 23rd July:</b>	Departure from Cardiff

# An Introduction to Cardiff

Cardiff is a modern, exciting and affordable city, with lots of things to do and see. The population is currently just under 350,000, including around 50,000 students, with many more thousands visiting each year.

There are lots of shops, restaurants, bars and coffee shops to explore in the city centre and in other parts of the city. There are also interesting cultural and historical places to visit, such as Cardiff Castle, in addition to green spaces and parks.

As the capital city of Wales, Cardiff is in an excellent location with great transport links to other parts of the UK and Europe. Cardiff is surrounded by countryside, and the beautiful Brecon Beacons National Park less than 30 miles away. It is also very close to the coast, with Cardiff Bay and Penarth very popular places to visit.

London is reachable in two hours via a direct train service from Cardiff Central railway station, and we are also connected to London by the M4 motorway. Additionally,

Cardiff Airport serves several European destinations. Once you are in Cardiff, most places are easily reachable by walking or by short trips on public transport.

Cardiff University dates back to 1883, meaning it has over 130 years of history. This is reflected in many of our buildings, and also in our reputation as one of the UK's top universities. Today, the University continues to be a centre for excellent teaching and research.



# International Summer Schools

## Course information



All of the International Summer Schools at Cardiff University College of Physical Sciences and Engineering are targeted towards advanced undergraduates or those who have recently graduated.



All of this year's Summer Schools will run from **Saturday 9th July to Saturday 23rd July 2016.**



The cost of each course is **£1,375**, which includes accommodation, 20 meals, airport pick-up and excursions.



If you have any questions, please email **[PSE-ISS@cardiff.ac.uk](mailto:PSE-ISS@cardiff.ac.uk)**.

Alternatively, please visit:

<https://cardiff.onlinesurveys.ac.uk/2016-international-summer-schools>

