

# Energy and Environmental Engineering

JUPAS Code: JS4462



Hosted by  
Department of Mechanical and Automation Engineering  
The Chinese University of Hong Kong



# B.Eng. (Hons) in Energy and Environmental Engineering

## Introduction

The Energy and Environmental Engineering (EEEN) Programme at CUHK provides the engineering knowledge and training for its graduates to tackle a broad spectrum of energy issues pertaining to sustainable, environmental and building technologies. The Programme puts forth a strong platform and broad-based perspective for learning and understanding the relations and trade-offs between energy and environment, and the ensuing engineering challenges in attaining viable solutions.

## Programme Features

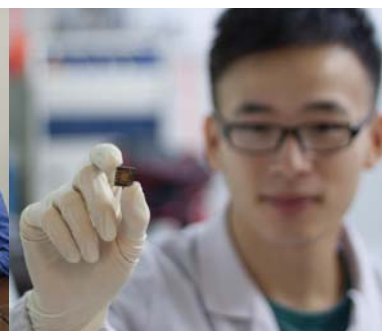
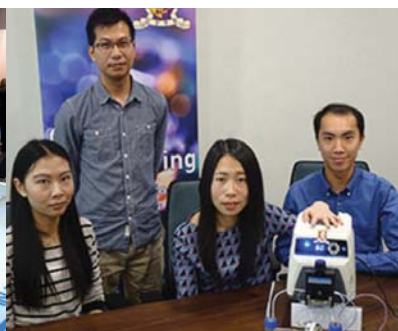
- Interdisciplinary & Problem-Solving:
  - Fundamental knowledge and problem-solving skills in energy principles, technologies, and systems.
  - Interdisciplinary major required and core elective courses are co-designed with the Earth System Science Programme and the School of Architecture, and a host of elective courses from the Environmental Science Programme, and the Department of Geography and Resource Management.
- Three Study Streams:
  - Sustainable Energy Technology Stream**, for enhanced coverage on renewable energy generation, system design, storage, distribution, and management;
  - Green Building Technology Stream**, for fundamental knowledge on environmental performance assessment and energy management of urban buildings;
  - Environmental Engineering Stream**, for principles of natural and built environments, and air pollution monitoring and control challenges.

## Programme Outcomes

Students will acquire fundamental knowledge in energy principles, technologies and environmental sciences, as well as the ability to facilitate solutions to problems related to energy technologies, environmental engineering, urban pollutions, building performance assessment and control, etc., that contribute to the well-being of our environment and society.

## Career Prospects

The Programme will afford graduates strong career prospects. They will find employability in current and emerging areas of energy systems, environmental monitoring and control, sensor instrumentation, and smart and green building technologies, among others. They can land jobs in Government, electric companies and power grid enterprises, building and construction industries, consulting firms and green groups, renewable technology companies, and vehicle industries, to cite just some of the possibilities. They can also pursue postgraduate studies in their specialized areas of interest in Hong Kong or overseas.



# Programme Curriculum

## Year 1

### Faculty Package

ENGG1110 Problem Solving By Programming  
ENGG1120 Linear Algebra for Engineers  
ENGG1130 Multivariable Calculus for Engineers

### Foundation Courses

MAEG1020 Computational Design and Fabrication  
MATH1510 Calculus for Engineers  
PHYS1110 Engineering Physics: Mechanics and Thermodynamics

### University Core Requirements

English (4 units), Chinese (3 units), College GE (3 units), Foundation GE (3 units), PE (2 units)

## Year 2

### Foundation Courses

ENGG2720 Complex Variables for Engineers  
ENGG2740 Differential Equations for Engineers

### Major Required Courses

EEEN2020 Renewable Energy Technologies  
EEEN2040 Building Service Engineering and Green Building  
ELEG2202 Fundamentals of Electric Circuits  
MAEG2030 Thermodynamics  
MAEG2601 Technology, Society and Engineering Practice (2 units)

### Major Electives

Core or Non-Core Elective (0-3 units)

### University Core Requirements

English (3 units), Chinese (3 units), Foundation GE (3 units) & Other GE (3 units)

EEEN2602 Engineering Practicum (1 unit)  
(5 weeks)

## Year 3

### Major Required Courses

EEEN2030 Energy and Environmental Economics and Management  
EEEN3030 Engineering Materials  
ELEG3207 Introduction to Power Electronics  
ESSC2800 Introduction to Environmental Engineering  
MAEG3030 Fluid Mechanics  
MAEG4030 Heat Transfer

### Major Electives

Core or Non-Core Electives (0-6 units)

### University Core Requirements

English (2 units), College GE (3 units), Other GE (3 units) & IT (1 unit)

## Year 4

### Major Required Courses

EEEN4998 Final Year Project I  
EEEN4999 Final Year Project II

### Major Electives

Core or Non-Core Electives (6-12 units)

### University Core Requirements

Other GE (3 units)

## Major Electives

### Sustainable Energy Technology Stream

(C)/(R) EEEN4020 Solar Energy and Photovoltaic Technology  
(N)/(E) CHEM4280 Chemistry in Biofuel (2 units)  
(N)/(E) EEEN4010 Kinetic Energy Harvesting Devices and Systems  
(N)/(E) EEEN4030 Nuclear Energy and Risk Assessment  
(C)/(E) EEEN4050 Energy Storage Devices and Systems  
(C)/(E) EEEN4060 Energy Distribution  
(N)/(E) ELEG3601 Introduction to Electric Power Systems  
(N)/(E) MAEG5120 Nanomaterials and Nanotechnology: Fundamentals and Applications  
(N)/(E) MAEG5150 Advanced Heat Transfer and Fluid Mechanics

### Green Building Technology Stream

(C)/(R) ARCH3424 Building Technology III: Environmental Technology  
(C)/(R) EEEN3010 Building Automation and Control  
(N)/(E) ARCH5431 Topical Studies in Building Technology  
(N)/(E) EEEN3020 Energy Utilization and Human Behavior  
(C)/(E) MAEG3050 Introduction to Control Systems  
(N)/(E) MAEG3920 Engineering Design and Applications  
(N)/(E) MAEG5150 Advanced Heat Transfer and Fluid Mechanics

### Environmental Engineering Stream

(C)/(R) ESSC4240 Air Pollution Science and Engineering  
(N)/(R) GRMD3203 Urban Environmental Problems  
(N)/(E) ARCH5431 Topical Studies in Building Technology  
(N)/(E) ENSC3230 Principles of Environmental Protection and Pollution Control  
(N)/(E) ENSC4240 Environmental Impact Assessment  
(N)/(E) ESSC2020 Climate System Dynamics  
(N)/(E) GRMD4204 Environmental Planning and Assessment  
(C)/(E) MAEG4080 Introduction to Combustion  
(N)/(E) MAEG5140 Materials Characterization Techniques

### Others

(N) CSCI1020 Hands-on Introduction to C++ (1 unit)  
(N) CSCI2040 Introduction to Python (2 units)  
(N) CSCI2100 Data Structures  
(N) ENGG1820 Engineering Internship (1 unit)  
(N) ENGG2760 Probability for Engineers (2 units)  
(N) ENGG2780 Statistics for Engineers (2 units)  
(N) ESSC3200 Atmospheric Dynamics  
(N) ESSC3220 Atmospheric Chemistry  
(N) ESSC3320 Hydrogeology  
(N) ESSC3600 Understanding Our Biosphere  
(N) ESSC3800 Global Environmental Change  
(N) ESSC4540 Remote Sensing - Principles and Applications  
(N) GRMD2404 Energy and Society  
(N) GRMD3202 Environmental Management  
(N) GRMD3403 Methods for Resource Evaluation and Planning  
(N) GRMD4202 Hydrology and Water Resources  
(N) GRMD4401 Energy Resources  
(N) PHYS4420 Physics in Meteorology

## Summary

	Units
<b>University Core Requirements (39 units)</b>	
- General Education (College/Foundation/Others)	21
- Languages (English & Chinese)	15
- Physical Education	2
- IT	1
<b>Major Requirements (75 units)</b>	
- Faculty Package	9
- Foundation Courses	13
- Required Courses	33
- Elective Courses (Core & Non-Core)	14
- Final Year Projects	6
<b>Free Electives (9 units)</b>	9
<b>Total</b>	<b>123</b>

(C) - Core Electives (at least 6 units are required)

(E) - Electives in specific streams

(N) - Non-Core Electives

(R) - Required Courses in specific streams

To qualify for a stream, students must complete a minimum of 12 units taken under the stream.

For updated information, please refer to <http://www.eeen.cuhk.edu.hk>.

## EEEN Scholarship

### Industrial Scholarship

With the generous donations from a number of industrial companies, many industrial scholarships are set up specifically for EEEN students.

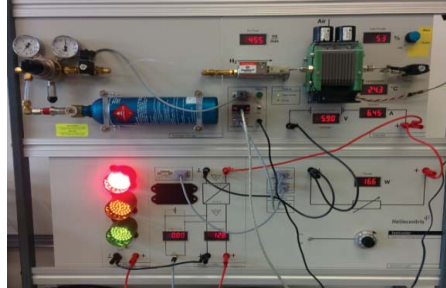
## Internship and Student Exchange Programme

EEEN students could opt for summer internship, work-study, or international student exchange programme. The in-field training helps prepare students to be the next generation professional engineers.

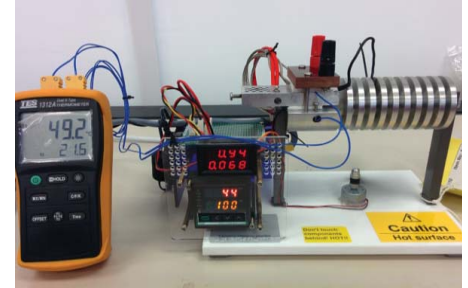
## Top-tier Teaching and Research Laboratory Facilities



Catalyst Test Rig for Energy and Environmental Applications



Hydrogen Fuel Cell Applications



Thermoelectric Power Generator

## Project Competitions and Field Trips



Award Winning at "New Energy New Generation" Solar Car Competition



Field Trip to Zero Carbon Building



2019 Graduates



Visit of Nobel Laureate, Prof. Steven Chu / Visit from Environmental Protection Department, HKSAR

## ENER Alumni

### LAW Shuk Wa (BEng in ENER 2016)

#### Assistant Engineer, ATAL Building Services Engineering Limited

I am currently working as an assistant engineer in ATAL Building Services Engineering Limited. The knowledge I gained from classes of Energy Engineering combined with the practical skills obtained from Industrial Training have equipped me for a better performance in my every day's work in Building Automation.



### WONG Hoi Yi (BEng in ENER 2017)

#### Graduate Trainee, CLP Power Hong Kong Limited

The EEEN programme covers a wide range of interesting topics, including building services, renewable energy, battery storage, energy efficiency and etc. Through this programme, apart from enriching the technical knowledge, it even provides me with a lot of eye-opening experience. Thanks to all these precious and unforgettable opportunities, they make me to get ready for the existing job in CLP.



### CHAN Tsz Wing Nicky (BEng in ENER 2018)

#### Graduate Environmental Consultant, AECOM Asia Company Limited

The duties of this position mainly relate to undertaking projects of Green Building Certificate Scheme, like BEAM Plus. Basic knowledge, which related to Building Engineering and requirement of the Green Building Scheme, is necessary for working in this post. As working here, it provides opportunities for building my career in Green Building Industry.



## Admissions

For details of the admission information, please refer to the EEEN Programme website: <http://www.eeen.cuhk.edu.hk> or the Office of Admissions and Financial Aid website: <http://www.oafa.cuhk.edu.hk>.

### Enquiry

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