

Energy and Environmental Engineering



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 renewable, 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:

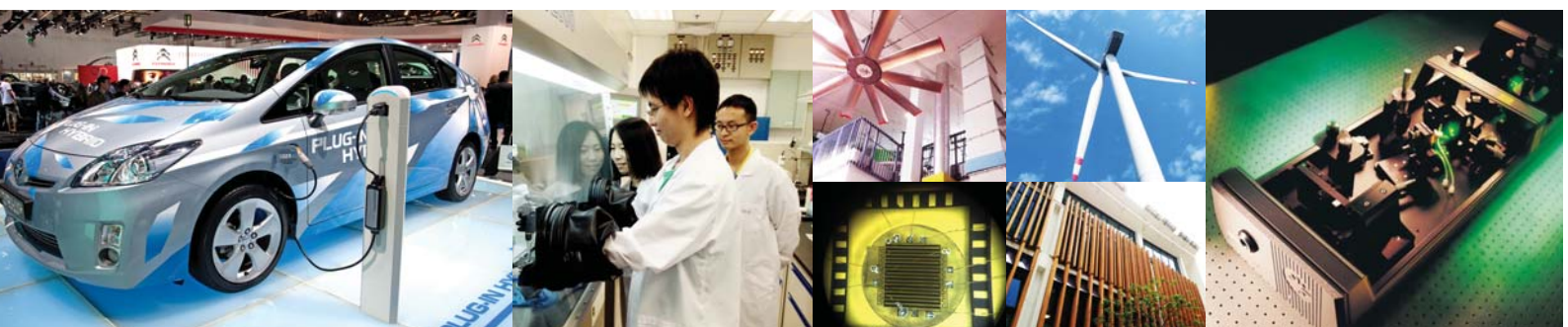
- Sustainable Energy Technology Stream, for enhanced coverage on renewable energy generation, system design, storage, distribution, and management;
- Green Building Technology Stream, for fundamental knowledge on environmental performance assessment and energy management of urban buildings;
- Environmental 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

ENGG1100 Introduction to Engineering Design
ENGG1110 Problem Solving By Programming

Foundation Science Courses

CHEM1380 Basic Chemistry for Engineers
ENGG1310 Engineering Physics: Electromagnetics, Optics and Modern Physics
LSCI1001 Basic Concepts in Biological Sciences
LSCI1003 Life Sciences for Engineers
PHYS1003 General Physics for Engineers
PHYS1110 Engineering Physics: Mechanics and Thermodynamics

Foundation Mathematics Courses

ENGG1410 Linear Algebra and Vector Calculus for Engineers
MATH1510 Calculus for Engineers

University Core Requirements

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

Year 2

Faculty Package

ENGG2601 Technology, Society and Engineering Practice (2 units)

Foundation Mathematics Courses

ENGG2420 Complex Analysis and Differential Equations for Engineers
ENGG2430 Probability and Statistics for Engineers

Major Required Courses

EEEN2020 Renewable Energy Technologies
ELEG2202 Fundamental of Electric Circuits
MAEG2030 Thermodynamics
SEEM2540 Energy and Environmental Economics and Management

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)

ENGG2602 Engineering Practicum (1 unit)
(5 weeks)

Year 3

Major Required Courses

EEEN3010 Building Automation and Control
ELEG3207 Introduction to Power Electronics
ESSC2800 Introduction to Environmental Engineering
MAEG3030 Fluid Mechanics

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) EEEN3030 Engineering Materials
(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
(N)/(E) EEEN4050 Energy Storage Devices and Systems
(N)/(E) EEEN4060 Energy Distribution
(N)/(E) ELEG3601 Introduction to Electric Power Systems

Green Building Technology Stream

(C)/(R) ARCH3424 Building Technology III: Environmental Technology
(N)/(R) ARCH5431 Topical Studies in Building Technology
(N)/(E) EEEN3020 Energy Utilization and Human Behavior
(N)/(E) MAEG3050 Introduction to Control Systems
(N)/(E) MAEG3920 Engineering Design and Applications
(N)/(E) MAEG4030 Heat Transfer

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
(N)/(E) MAEG4080 Introduction to Combustion

Others

(N) CSCI1020 Hands-on Introduction to C++ (1 unit)
(N) CSCI1040 Hands-on Introduction to Python (1 unit)
(N) CSCI1050 Hands-on Introduction to MATLAB (1 unit)
(N) CSCI2100/ESTR2102 Data Structures
(N) ENGG1820 Engineering Internship (1 unit)
(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
University Core Requirements (39 units):	
- General Education (College/Foundation/Others)	21
- Languages (English & Chinese)	15
- Physical Education	2
- IT	1
Major Requirements (75 units)	
- Faculty Package	9
- Foundation Science	9
- Foundation Mathematics	12
- Required Courses	24
- Elective Courses (Core & Non-Core)	15
- Final Year Projects	6
Free Electives (9 units)	<u>9</u>
Total	<u><u>123</u></u>

(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.een.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.

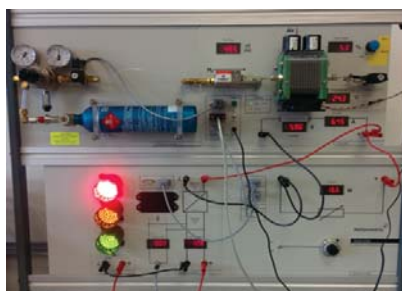
Internship and Student Exchange Programme

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.

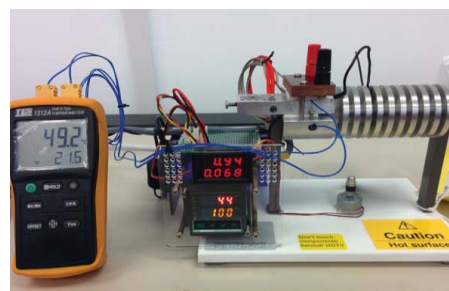
Top-tier Teaching and Research Laboratory Facilities



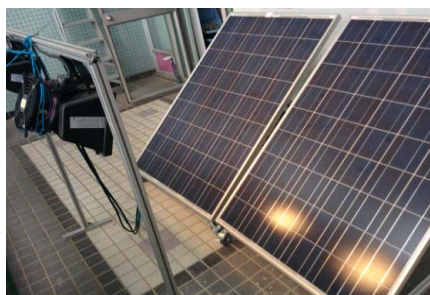
Renewable Energy Power Plant



Hydrogen Fuel Cell Applications



Thermoelectric Power Generator



Solar Cells



Source: Rigaku

Intelligent X-ray Diffraction System



Source: JEOL

Scanning Electron Microscope

Project Competitions and Field Trips



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



Field Trip to Zero Carbon Building



Visits Guangdong Daya Bay Nuclear Power Station



Field Trip to CLP GREEN^{PLUS} Resort

Admissions

For details of the admission information, please refer to the Faculty brochure or the Faculty website: <http://www.erg.cuhk.edu.hk>.

Enquiry

Department of Mechanical and Automation Engineering
Room 213, William M.W. Mong Engineering Building
The Chinese University of Hong Kong
Shatin, N.T., Hong Kong

Telephone No.: 3943 1381 / 3943 8337
Fax No.: 2603 6002
Email: dept@mae.cuhk.edu.hk
Homepage: <http://www.eeen.cuhk.edu.hk>