Energy Engineering

Hosted by

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

B.Eng. (Hons) in Energy Engineering

Introduction

The Energy Engineering Programme of CUHK is designed to face the challenge that energy has become one of the most important areas of concern in the world in the 21st century, and renewable energy, environment, sustainable development, and green technology have been attracting unprecedented interests from a broad spectrum of the global community including governments, businesses, industries, and academia.

Programme Objectives

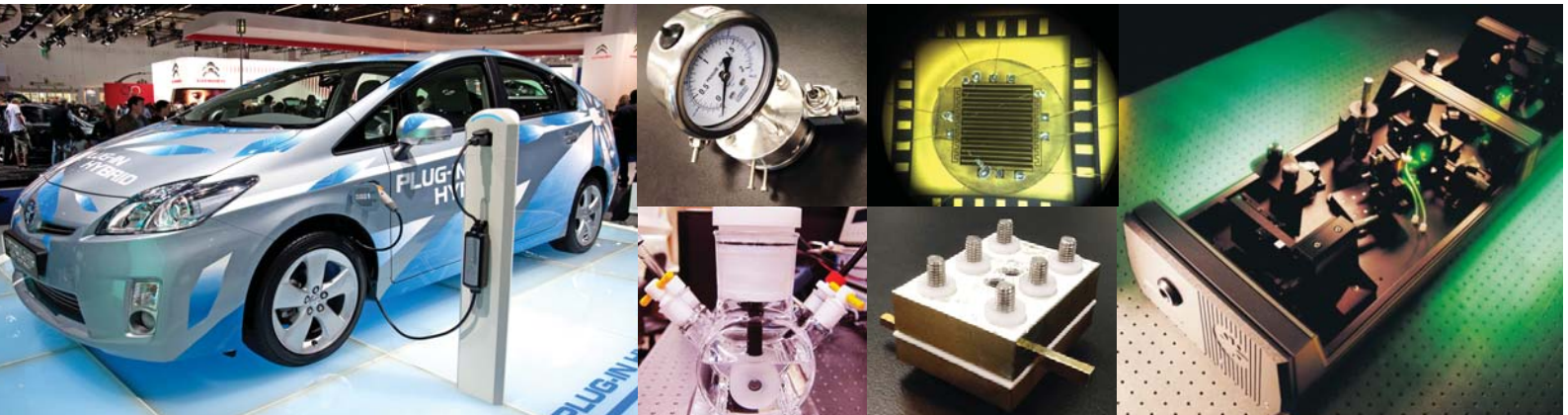
The Programme emphasizes emerging technologies on how energy and especially clean energy can be generated and harvested. The Programme stresses a balance between fundamental concepts and hands-on practice, with the goal of producing engineers who can contribute to the well being of the environment and the Hong Kong society through innovative problem-solving skills and adaptability toward the latest technological advances.

Programme Features

- Fundamental knowledge in energy principles, technologies and systems
- Foundational concepts on energy generation, storage, consumption, distribution, management, efficiency optimization, and tradeoffs
- Specialized learning on solar power, wind power, thermoelectric power, nuclear power, kinetic energy harvesting, biofuel, batteries and fuel cells
- Macroscope studies in energy utilization and management, energy policies, and energy-environment inter-relation
- Professional training in technical communications, engineering ethics, design application and final year projects
- Project-based learning on practical solutions for targeted energy-related problems and themes

Career Prospects

Upon graduation, Energy Engineering students will find career opportunities as power engineers, energy device engineers, energy auditors, environmental engineers, technical analysts or consultants for corporations, inspectors or officers to enforce government regulations on energy and environment, and other professions. They can also pursue a career in the Hong Kong BEAM Society (Building Environmental Assessment Method) or postgraduate studies in their specialized areas of interest in Hong Kong or overseas.



Programme Curriculum

The Energy Engineering Programme includes core courses covering fundamental knowledge of energy engineering, and elective courses to specialize in specific technology areas. The courses include joint offerings with the Faculty of Science and other faculties to cover subject matters including chemical and environmental sciences, energy efficiency design of buildings, energy economics, and government policy making.

Faculty Package (9 units)

ENGG1100 Introduction to Engineering Design
ENGG1110 Problem Solving By Programming
ENGG2601 Technology, Society and Engineering Practice (2 units)
ENGG2602 Engineering Practicum (1 unit)

Foundation Science Courses (9 units)

CHEM1070 Principles of Modern Chemistry
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 (12 units)

ENGG1410 Linear Algebra and Vector Calculus for Engineers
ENGG2420 Complex Analysis and Differential Equations for Engineers
ENGG2430 Probability and Statistics for Engineers
MATH1510 Calculus for Engineers

Major Required Courses (18 units)

ELEG2202 Circuits and Devices I
ENER2010 Energy Technologies and the Environment
ENER2020 Renewable Energy Technologies
ENER3030 Engineering Materials
MAEG2030 Thermodynamics
SEEM2540 Energy Economics and Management

Major Electives (21 units)

Core Electives: (at least 8 units)

CHEM4280 Chemistry in Biofuel (2 units)
EEEN3010 Building Automation and Control
ELEG3601 Introduction to Electric Power Systems
ENER4010 Kinetic Energy Harvesting Devices and Systems
ENER4020 Solar Energy and Photovoltaic Technology
ENER4030 Nuclear Energy and Risk Assessment
ENER4050 Energy Storage Devices and Systems
ENER4060 Energy Distribution
ESSC2800 Introduction to Environmental Engineering
MAEG4030 Heat Transfer
MAEG4080 Introduction to Combustion

Non-core Electives:

ARCH2421 Introduction to Building Technology
ARCH3424 Building Technology III: Environmental Technology
ARCH5431 Topical Studies in Building Technology
CSCI1020 Hands-on Introduction to C++ (1 unit)
CSCI1040 Hands-on Introduction to Python (1 unit)
CSCI1050 Hands-on Introduction to MATLAB (1 unit)
CSCI2100 Data Structures
ELEG3207 Introduction to Power Electronics
ENER3020 Energy Utilization and Human Behaviour
ENGG1820 Engineering Internship (1 unit)
ENSC2270 Introduction to Environmental Science
ENSC3230 Principles of Environmental Protection and Pollution Control
ENSC4240 Environmental Impact Assessment
ESSC2020 Climate System Dynamics
ESSC4240 Air Pollution Science and Engineering
GRMD2404 Energy and Society
GRMD3203 Urban Environmental Problems
GRMD4202 Hydrology and Water Resources
GRMD4204 Environmental Planning and Assessment
MAEG2020 Engineering Mechanics
MAEG3010 Mechanics of Materials
MAEG3030 Fluid Mechanics
MAEG3050 Introduction to Control Systems
MAEG3920 Engineering Design and Applications
MAEG4020 Finite Element Modelling and Analysis

Research Component Courses (6 units)

ENER4998 Final Year Project I
ENER4999 Final Year Project II

For updated information, please refer to http://www.ener.cuhk.edu.hk.

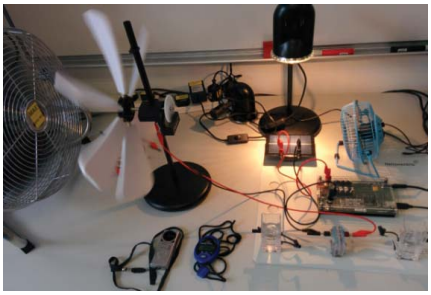
ENER Scholarship

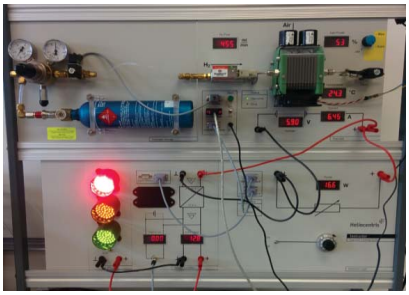
Industrial Scholarship
With the generous donations from a number of industrial companies, many industrial scholarships are set up specifically for ENER students.

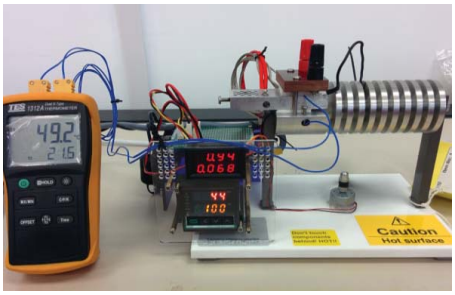
Internship and Student Exchange Programme

ENER 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

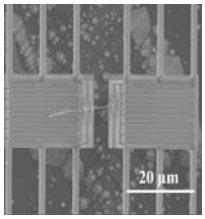


Thermoelectric Power Generator


Solar Cells


Source: Rigaku
Intelligent X-ray Diffraction System


Source: JEOL

Suspended Micro-device


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

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