HKUST(GZ)

Introduction to Sustainable Energy and Environment Thrust

香港科技大学(广州)
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY (GUANGZHOU)

功能枢纽
FUNCTION HUB
可持续能源与环境学域
Sustainable Energy and Environment Thrust

Wind, Biomass, Hydro-power,
Geo-thermal, Marine

Energy ← **Source** → **Emission**

Green House Gases,
Atmospheric Aerosols

Energy flow

- Harvesting
- Conversion
- Storage
- Distribution
- Energy saving

Pollutant transport

- Formation
- Transformation
- Transport
- Distribution
- Exposure

Environment-friendly Energy System

Sustainable Living Environment

Global Challenges

Carbon Emission	Global Warming	Energy Crisis
Green Energy	Health Risks	Air Pollution

Research Means:

- Bio-inspired engineering
- Carbon capture & conversion
- Wireless transfer
- Battery optimization
- Self-powering
- Energy optimization
- Green & healthy building design

End user

Exposure population

Mankind

Research Means:

- Source tracing
- Climate modeling
- Process simulation
- Risk assessment
- Health impacts
- Pollution control

Multidiscipline

Physics | Fluid Mechanics
Mechanical Engineering
Photovoltaic Engineering
Process System Engineering
Electrical and Computer Engineering
Electrical and Electronic Engineering

Toxicology
Exposure Science
Atmospheric Science
Chemical Engineering
Environmental Science
Environmental Engineering
Building Services Engineering

Curriculum

Courses on Domain Knowledge

SEEN 5010	Experiment Design and Analysis
SEEN 5020	Design and Optimization of Energy Systems
SEEN 5030	Battery Sustainability
SEEN 5040	Modeling and Simulation of Complex Energy Systems
SEEN 5060	Greenhouse Gas, Air Pollutant Emissions and Mitigation
SEEN 5090	Physical Chemistry of Advanced Energy Materials
SEEN 5100	Hydrogen Energy and Fuel Cell
SEEN 5110	Global Energy and Environment Policy
SEEN 5120	Lifecycle Energy and Economic Analytics
SEEN 5130	Green Building in Sustainable Development
SEEN 5140	Digitalization and Intelligence of Integrated Building Energy Systems
SEEN 5150	Kinetic Energy Harvesting and Conversion
SEEN 5210	Energy Materials and Systems
SEEN 5310	Bio-inspired Energy Systems
SEEN 5320	Machine Learning in Advanced Energy Systems
SEEN 5330	Electrical Power Systems
SEEN 5360	Inorganic Photovoltaic Materials and Devices

More additional courses will be offered by SEE in the future

PhD

Full-time	3Y with relevant research master's degree 4Y without a relevant research master's degree
Part-time	6 years
Minimum credit(s)	21
Course Requirements	**Credit(s)**
University PG Core Courses	2
Hub PG Core Courses	4
PG Seminar Courses (two terms)	0
Teaching Assistant Training	0
Required PG courses	15
Credit Transfer	(⩽ 6)

Until November 2023

Research Areas

- High Heat Flux Thermal Management

  (for LED, high power electronics, flexible devices, Power Batteries)

- Bio-inspired Systems for Energy and Micro Air Vehicles
- Materials Informatics
- Indoor/Outdoor Anthropogenic-related Air Pollution and its Comprehensive Control Measures
- Emission Characterization and Mitigation for Air Pollutants and GHGs

  (Emission inventory, modeling, and co-control of APs & GHGs)
  (Source measurement, tracing, and application of big data and AI)

- High-performance Triboelectric Nanogenerator and Tribophotonics
- Intelligent Low-carbon Buildings
- Advanced Electric Power Conversion
- Smart Batteries Towards a More Sustainable World
- Electric Propulsion and Energy Management Systems
- Carbon Capture and Low-carbon Chemical Processes
- Next-generation Solar Cell Materials and Devices
- Indoor and Outdoor Air and Health
- Solar-thermal Energy Harnessing and Regulation

  (for carbon capture, solar-fuel, thermal energy storage, and thermal regulation)

- Advanced Membranes and Porous Materials for Separations
- Soft Materials Innovations for Energy and Sustainability
- Air Quality in the Built Environment
- Triboelectric Nanogenerator Enabled Self-powered System

Why SEE

- SEE is privileged in sustainability, energy, and environment and striving towards excellence to be the global leader for energy, environment, and sustainability.
- Our cross-disciplinary research achievements underpin the education we offer to our students.
- Our goal is to nurture a new generation of energy professionals who take a cross-disciplinary and holistic view of climate change mitigation and emissions reduction in finding.

Related Research Facilities

- Materials Characterization and Preparation Facility
- Nanosystem Fabrication Facility
- Bio-inspired Engineering Research Facility
- Sustainable Atmospheric Environment Research Facility
- Brilliant Energy Science and Technology Lab
- Atmospheric Environmental Risk Characterization and Management Lab

Contact us

Official WeChat account

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Online Application System

Admission Requirement