PHYS 4016 Renewable Energy Materals and Devices (3,3,0)
Prerequisite: PHYS 3015 Structure and Properties of Matter or consent of instructor
This course provides students an insight on understanding the renewable energy materials and devices with emphasis on semiconductor science and photovoltaic technologies for application in energy harvesting. Topics cover the principles of semiconductor physics, basic energy bands, carrier transport, p-n junctions, photovoltaic effect, device structures, applications and recent advances in solar cell technologies.

PHYS 4017 Semiconductor Physics and Devices (3,3,0) (E)
Prerequisite: PHYS 3015 Structure and Properties of Matter or consent of instructor
This course introduces the basic physics of semiconductor materials and the physical principles of key semiconductor devices. Both electronic and optical properties of semiconductors are covered. Selected applications of the semiconductor devices, e.g. in light-emitting diodes, solar cells and photo-detectors, will be presented.

PHYS 4025 Solid State Physics I (3,3,0) (E)
Prerequisite: PHYS 3015 Structure and Properties of Matter of consent of instructor
This course studies applications of statistical physics and quantum mechancis to the solid state of matter. Aspects included are crystal structures, X-ray diffraction, lattice dynamics, thermal properties, and band theory of solids.

PHYS 4026 Surface Analysis and Characterization (3,3,0)
Prerequisite: CHEM 3027 Materials Testing and Characterization or consent of instructor
This course provides students an insight on understanding the principles of most commonly used techniques for materials characterization with emphasis on surface analysis, typical instrumentation, and analytical methods that are widely used for application in characterizing surface properties of chemicals, polymers, ceramics, semiconductors, alloys, metals and composites.

PHYS 4027 Computational Physics (3,3,0) (E)
Prerequisite: Year IV standing or consent of instructor
This is an introductory course on computer simulation. By working through selected examples, including green energy related topics such as the OLED emission, students will learn basic programming strategies, as well as an appreciation of important concepts in numerical analysis, such as accuracy, stability, and deficiency of various algorithms. The course includes a lab component which gives the student hands-on experience on computer simulation. An introduction to higher level languages or subroutines may also be included.

PHYS 4035 Topics in Energy Science I (3,3,0)
PHYS 4036 Topics in Energy Science II (3,3,0)
PHYS 4037 Topics in Energy Science III (3,3,0)
Prerequisite: Year IV standing or consent of instructor
These courses are specialized courses reflecting the development of the time and the research interests of the faculty. Examples of topics include Materials Science, Electronic Instrumentation, Optoelectronics, Spectroscopy, and Nuclear Physics and Technology. These courses can be repeated for credit if the topics are different.

PHYS 4045 Electromagnetic Waves and Optics (3,3,0) (E)
Prerequisite: PHYS 3027 Intermediate Electromagnetism or consent of instructor
The first part of this course introduces the classical theory of electromagnetic waves and their interactions with matter. The second part treats interference and diffraction. The third part covers laser basics and Gaussian beams. Current topics will also be discussed.

PHYS 4046 Quantum Mechanics (4,4,0)
Prerequisite: PHYS 3005 Atomic and Nuclear Physics or consent of instructor
To learn the basic theory of quantum mechanics: from the wave mechanics of a particle in one dimension, through formalistic Hilbert space and matrix mechanics, to many particle systems.

PHYS 4898-9 Final Year Project I & II (3,0,9) (E)
Prerequisite: Year IV standing or consent of instructor
All final year students majoring in Green Energy Science have to complete a project. The project may be taken as a semester-project or a year-project. It is one of the key elements in the programme to train students to explore energy science in a research setting. The range of projects is diverse and each student will work independently under faculty supervision. Upon completion, the student will gain valuable hands-on experience in problem solving. He will be required to communicate his results via written texts and oral presentation.

PHYS 7040 Advanced Topics in Physics I (3,3,0) (E)
PHYS 7050 Advanced Topics in Physics II (3,3,0)
PHYS 7060 Advanced Topics in Physics III (3,3,0)
Prerequisite: Postgraduate standing or consent of instructor
These courses cover advanced topics of physics at the postgraduate level. The topics include: (1) Materials Science (Semiconductor Physics, Structural and Device Materials, Characterization Techniques); (2) Optics and Lasers (Optoelectronic Devices and Systems, Laser Physics and Applications, Spectroscopy); (3) Instrumentation (Data Capture, Noise Reduction and Signal Recovery); (4) Acoustics; (5) Advanced Quantum Mechanics; (6) Advanced Statistical Physics; (7) Advanced Condensed Matter Physics; (8) Advanced Computational Physics; (9) Nonlinear Dynamic and Chaos; (10) Phase Transitions and Critical Phenomena

PHYS 7320 Renewable Energy Technologies I (3,3,0) (E)
This course introduce the principles and technologies of renewable energy. After completion of this course, students will learn (1) the origin of renewable energy flow; (2) blackbody radiation, solar spectrum and radiation; (3) the Earth's energy budget; (4) working principles of inorganic and organic photovoltaic cells; (5) device fabrication and architecture; (6) materials science and characterization methodology of photovoltaic cells; and (7) solar cell systems and installation.

PHYS 7330 Renewable Energy Technologies II (3,3,0) (E)
Prerequisite: PHYS 7320 Renewable Energy Technologies I
After completion of this course, students will learn (1) the origin of renewable energy flow; (2) individual renewable energy sources, including solar radiation, wind, ocean waves, water flows and tides, heat flows and stored heat, biomass; (3) large scale energy conversion processes; and (4) power transmission and energy storage technologies.

PHYS 7340 Renewable Energy Technologies III (3,3,0) (E)
Prerequisite: PHYS 7330 Renewable Energy Technologies II
After completion of this course, students will learn the following: (1) renewable energy system analysis; (2) harvesting parasitic energy in daily life; (3) harvesting chemical energy; and (4) energy conservation.

PHYS 7350 Geographic Information System and Remote Sensing (3,3,0) (E)
In this course, students will learn the following: (1) atmospheric physics; (2) principles of radiation and energy transfer in the atmosphere; (3) measurement techniques of atmospheric parameters and constituents; (4) satellite and remote sensing instrumentation; and (5) data inversion methodology and algorithm.

PHYS 7360 Green Laboratory (3,0,3) (E)
This laboratory course includes lectures, lab exercises, and project-based experiments. The laboratory provides a set of practical

experiments, which related to (1) energy harvesting; (2) energy conversion efficiency; (3) energy conservation; (4) measurements of meteorological parameters and atmospheric constituents; (5) meteorological instrumentation; and (6) characterizations of energy harvesting materials and solar cells.

PHYS 7371-2 Project in Green Technology (6,0,3) (E)
The objective of the course is to enable students to develop mastery of green technology related concepts, including energy harvesting, energy conservation, and pollution monitoring. Students are expected to perform a highly independent work. After completion of this course, they will be able to demonstrate their mastery of course materials and apply what they have learnt in implementing practical problems. Students may propose a topic or select a project from a list of topics provided by the Department.

PHYS 7410 Physics for Green Technology (3,3,0) (E)
This course covers the physics for green technology and environmental science, including classical and fluid mechanics, thermodynamics, electrostatics and electricity, electromagnetic waves, optics, and modern physics.

PHYS 7420 Energy Usage, the Environment and Sustainability (3,3,0) (E)
This course allows students to comprehend the significance of energy sources, their capacity, security, costs and their effects on the environment. The energy production and economic distinction between non-renewable (e.g. coal, gas, oil and nuclear fuel) and renewable sources (e.g. wood, biomass, hydro, solar, wind, geothermal and ocean) upon amongst different countries will be explored. In addition, an examination on the role of nuclear energy and its concerns in radiation, spent fuel waste disposal and safety issue are addressed.

PHYS 7430 Introduction to Modern Materials (3,3,0) (E)
This course aims to provide a broad base on properties of modern materials and their applications. Topics cover structure, properties and functionality of materials including metals, ceramics, polymers and semiconductors.

PHYS 7440 Principles of Optoelectronics (3,3,0) (E)
This course aims to provide a broad base on optoelectronic properties of semiconductors and device applications. Topics cover surface and interface of semiconductors, optical properties of semiconductors, light generation in semiconductors and recent advances in organic electronics.

PHYS 7450 Principles of Photonic Physics (3,3,0)
This is an introduction into advanced topics in propagation of electromagnetic waves in a medium and interaction of electromagnetic waves with matter. Topics covered include derivation of optical constants such as susceptibility and dielectric constants, absorption, scattering and refraction.

PHYS 7460 Advances in Displays and Lighting (3,3,0) (E)
This course provides students an insight on understanding the principles of displays and lighting that are widely used for application in mobile appliance, automotive lighting, traffic signals, signage, LCD backlighting, advanced displays and energy efficient lighting.

PHYS 7470 Energy Audit and Management (3,3,0)
This is a professional training course leading to the certified energy manager (CEM) requirement under the Association of Energy Engineers (AEE), USA. The course covers the latest energy cost reduction techniques in commercial building and the manufacturing industries of which CEM is an internationally recognized professional certification in energy management. The training focuses on the technology, the economics, the policies and the regulations for effective energy management.

POLS 1005 Foundations of Political Science (3,2,1) (E)
This is a course which introduces students to a comprehensive review of the field of political science. Basic concepts, political theories and methodologies, political institutions, political parties are all examined. The Subfields of comparative politics and international relations are also integral parts of the course so as to lay down the foundation for further studies. Political developments in Europe and China are frequently employed as examples and related to the introduction of political ideas.

POLS 1110 Introduction to Research Methods (3,2,1)
This course is designed to enhance students' ability to perceive, evaluate and understand political phenomena through a systematic introduction to a wide range of approaches, methods and theories of political science. Basic research procedures and academic writing are the other foci of the course. Students are encouraged to analyse and explain the current political development of Europe, mainland China or Hong Kong with the help of particular perspectives and research methods. This course is open to GIS and European Studies majors only.

POLS 1120 Introduction to Political Economy (3,2,1)
Political economy, with its roots in the European 17th and 18th centuries, was the forefather of what developed in the 20th century into the two separate disciplines of political science and economics. However, it has remained as that discipline which examines the relationship of the individual to society, the economy, and the state. It is the study of relations and choices, of structures and institutions, of scales from the personal and local to the national, international, and global. Its originators include Locke, Hobbes, Adam Smith, Karl Marx, and Max Weber. Including choice theory and market theory, system theory, development theory and public policy theory, political economy examines the historic and human behavioural linkages among values/morals, politics, economic reality and economic reasoning. This course is open to GIS majors and GIS minors only.

POLS 1140 Political Movements: Chinese and European (3,2,1)
Prerequisite: *For GIS major*: POLS 1510 Foundations of Political Science or POLS 1520 Government and Politics of China
For ES major: EURO 1111 Europe: Unity and Diversity
The course examines three major political movements—nationalism, liberalism, and socialism—within a comparative context. By "movement" is meant not solely an ideology, but an ideology in relation to concrete political developments and popular mobilization. European experience of the three movements will be compared and contrasted with Chinese experience. This course is open to GIS and European Studies majors only.

POLS 1150 Introduction to China Studies (1,0,0)
This one-unit course is designed specially for Year I China Studies students. It introduces students to the origin and development of China studies by examining the state of research and substantive knowledge in the field. It also introduces works by noted China-watchers or sinologists as well as publications by the teaching staff of China studies at the Hong Kong Baptist University, with an emphasis on the multidisciplinary nature of the field.

POLS 1510 Foundations of Political Science (3,2,1)
This is a course which introduces to students a comprehensive review of the field of political science. Basic concepts, political theories and methodologies, political institutions, political parties are all examined. The subfields of comparative politics and international relations are also integral parts of the course so as to lay down the foundation for further studies. Political developments in Europe and China are frequently employed as examples and related to the introduction of political ideas.