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