PHYS 3910 Topics in Physics I (*,*,*) (E)
PHYS 3920 Topics in Physics II (*,*,*) (E)
PHYS 3930 Topics in Physics III (*,*,*) (E)
Prerequisite: Year III standing or consent of the instructor
This course covers more advanced topics or topics of current interest. A partial list of the topics includes the following: Acoustics, Computer-controlled Instrumentation, Materials Science, Electronic Instrumentation, Lasers and Their Applications, Optoelectronics, Seminconductor Physics, and Spectroscopy. This course can be repeated for credit if the topic is different.

PHYS 4005 Non-Fossil Fuels (3,3,0)
Prerequisite: PHYS 3005 Atomic and Nuclear Physics and PHYS 3015 Structure and Properties of Matter or consent of instructor
This course covers the physics and working principles of important nonfossil fuels, including nuclear, geothermal, and solar energy sources. Environmental impacts of the various technologies are explained. Selected examples of emerging technologies and latest developments are also discussed.

PHYS 4006 Advanced Green Energy Laboratory (Metrology) (3,0,3)
Prerequisite: PHYS 3017 Green Energy with LabView or consent of instructor
This laboratory course uses LabVIEW based software to perform experiments. The teaching mode includes lectures, lab exercises, and project-based experiments 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 4007 Advances in Displays and Lighting (3,3,0)
Prerequisite: PHYS 4025 Solid State Physics I and PHYS 4017 Semiconductor Physics and Devices, or consent of instructor
This course provides students with 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 4015 Introduction to Intellectual Property (2,2,0)
Prerequisite: Year IV standing
This is an elective course for Year IV students majoring in Green Energy Science but it is open to all senior year students in all majors. The course offers basic knowledge on copyrights, patent filing and patent application.

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)
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)
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 4027 Computational Physics (3,3,0)
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 4898-9 Final Year Project I & II (3,0,9)
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 7320 Principles and Technologies of Renewable Energy I (3,3,0)
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 Principles and Technologies of Renewable Energy II (3,3,0)
Prerequisite: PHYS 7320 Principles and Technologies of Renewable Energy 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 Energy Harvesting and Energy Conservation (3,3,0)
Prerequisite: PHYS 7320 Principles and Technologies of Renewable Energy 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.