also introduces the basic concepts of radioactivity and nuclear reactions and lays a foundation for understanding the working principles of nuclear power generation.

PHYS 3006 Renewable Energy Sources (3,3,0)
Prerequisite: PHYS 2005 Heat and Motion or consent of instructor
This course covers the physics and working principles of renewable energy sources such as wind, water, biomass, and geothermal energy. Environmental impacts of the various technologies are explained. Selected examples of emerging technologies and latest developments are also discussed.

PHYS 3007 Energy Storage, Distribution and Conservation (3,3,0)
Prerequisite: PHYS 2005 Heat and Motion or consent of instructor
This course explores the current practice and emerging technologies in energy storage, distribution and efficient energy usage. Selected topics on novel technologies such as high power density rechargeable batteries, nonhydrogen based fuel cells, and smart energy management etc. will also be discussed.

PHYS 3015 Structure and Properties of Matter (3,3,0)
Prerequisite: PHYS 3005 Atomic and Nuclear Physics or consent of instructor
By using the framework of quantum physics, this course examines the structural, chemical, and electronic properties of matter, which form the basis for energy device applications.

PHYS 3016 Energy Management (3,3,0)
Prerequisite: PHYS 2005 Heat and Motion or consent of instructor
This course explores the basic energy management strategy to streamline energy flow and maximize energy usage efficiency in daliy life. In addition to new supply-side management topics not covered in PHYS 3007 Energy Storage, Distribution and Conservation, the course will emphasize demand-side management including economics models, energy audit procedure, user-based source planning and implementation methods.

PHYS 3017 Green Energy Lab with LabVIEW (3,0,3)
This course provides an introductory level to graphical programming for data acquisition and instrument control encountered by science students, using LabVIEW™ as the programming platform. This course has experiments in the area of energy generation and device characterization such that the measurements are carried out with the use of LabView for data acquisition, data conversion, information presentation and file storage and retrieval.

PHYS 3025 Physics and Technology of Energy Conversion (3,3,0)
Prerequisite: PHYS 2005 Heat and Motion or consent of instructor
This course provides a solid foundation of energy conversion technology which is the key to renewable energy science. The processes include the conversion of Thermal, Mechanical and Chemical energy into electricity.

PHYS 3026 Instrumentation and Data Acquisition Laboratory (3,*,*)
Prerequisite: COMP 1005 Essence of Computing
This course introduces graphical programming for data acquisition and instrument control encountered by science students, using LabVIEW™ as the programming platform. This course provides a basic concept of hardware interface and sampling theory, and to equip students with practical skills to data acquisition, analysis and instrument control.

PHYS 3027 Intermediate Electromagnetism (3,3,0)
Prerequisite: PHYS 2006 Electricity and Magnetism or consent of instructor
This course studies electomagnetism up to Maxwell's equations at an intermediate level. It uses the tools of vector calculus for solving special problems in electrostatics and magnetostatics including the presence of dielectric and magnetic materials.

PHYS 3035 Energy and Thermodynamics (3,3,0)
Prerequisite: PHYS 2005 Heat and Motion or consent of instructor
This course introduces the relation between free energy and kinematics by demonstrating the statistical formalism of thermodynamics. Different kinds of free energy for different ensembles will be discussed, followed by applications of the statistical formalism to simple thermodynamic systems.

PHYS 3036 Mechanics (3,3,0)
Prerequisite: PHYS 2005 Heat and Motion or consent of instructor
This course deals with the basic theory of Lagrangian and Hamiltonian mechanics, coupled oscillations, and central force motion. It extends the basic discussions on mechanical motion in the lower level course, Heat and Motion, to a more general mathematical and theoretical framework, and provides a broader foundation for understanding and employing classical mechanics in energy science applications.

PHYS 3037 Guided Study in Physics and Energy Science II (3,0,0)
This course is part of an elite undergraduate study program supervised by a faculty membter in the Physics Department. The goal is to prepare the student for advanced studies and research in physics and energy science. Examples of topics include electrodynamics, statistical physics, materials science, electronic instrumentation, spectroscopy, and nuclear physics and technology. The student should accomplish one of the following. (1) Research on a non-textbook problem, (2) qcquire a research skill, (3) learn how to use a research tool, or (4) study an advanced subject in depth. The student must submit a written report at the end of the semester.

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.