Courses

**NE 5519 Energy Systems and Nuclear Power: 3 semester hours.**
Fundamentals of conventional and renewable energy systems. Energy sources, distribution, use and environmental effects. Nuclear power plant "balance of plant" design. Specific, evaluated graduate-level activities and/or performances are identified in the course syllabus. PREREQ: ME 3307 and MATH 3360 or instructor permission.

**NE 5521 Mathematical Methods in Nuclear Engineering: 3 semester hours.**
First and second order ordinary differential equations (ODEs), generalization to systems of ODEs, Laplace transforms, series solutions to second order ODEs, special functions and Sturm-Liouville systems; partial differential equations by separation of variables. Examples will emphasize practical problems of interest to nuclear engineers. PHYS 6602 may be substituted for this course. PREREQ: MATH 3360.

**NE 5543 Thermal Fluids Laboratory: 1 semester hour.**
Measurement of thermal and fluid properties, experiments on fluid flow and heat transfer systems. Equivalent to ME 5543. PREREQ: ME 3341 and NE 5576 or NE 4476.

**NE 5545 Reactor Physics: 3 semester hours.**
Neutron balance equations in reacting systems, diffusion and diffusion-perturbation theory, introductory reactor kinetics, the multi-group energy approach, neutron slowing down and thermalization, introductory concepts in reactor systems. PREREQ: NE 3302 or NSEN 6685, and NE 5521 or equivalent.

**NE 5546 Nuclear Fuel Cycle Systems: 3 semester hours.**
Uranium mining, milling, conversion; enrichment technology including cascade analysis; fuel fabrication, criticality safety in the nuclear fuel cycle, introduction to ORIGEN and Monte-Carlo methods and codes, reactor fuel management, waste management (LLW, HLW, TRU waste). PREREQ: NE 3302 or NSEN 6684 or equivalent.

**NE 5548 Design Control and Use of Radiation Systems: 3 semester hours.**
Generation detection and measurement systems design for control and use of neutrons and gamma rays in industrial and medical applications. Radiation protection, regulations, environmental and economic considerations. COREQ: ENGR 5545.

**NE 5551 Nuclear Seminar: 1 semester hour.**
Current topics in nuclear science and engineering. Specific, evaluated graduate-level activities and/or performances are identified in the course syllabus. PREREQ: Graduate student status in NSEN or HPHY program.

**NE 5558 Monte Carlo Methods and Applications: 3 semester hours.**
Basics of the application of stochastic methods to calculate the transport of neutrons, photons, and other sub-atomic particles. Includes introduction to the MCNP code, and sample application problems in both nuclear reactor design and in applications such as radiation beams used for cancer therapy.

**NE 5576 Heat Transfer: 3 semester hours.**

**NE 5578 Reliability and Risk Assessment: 3 semester hours.**
Methods of evaluating process and equipment reliability. Probabilistic methods applied to analysis and design. Setting probabilistic design objectives and calculating probabilistic performance. Specific, evaluated graduate-level activities and/or performances are identified in the course syllabus. PREREQ: MATH 3360 and EE 4416 or permission of instructor.