

# ENNU - ENGINEERING, NUCLEAR

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## ENNU468 Research (2-3 Credits)

Investigation of a research project under the direction of one of the staff members. Comprehensive reports are required.

**Restriction:** Permission of instructor; and permission of ENGR-Materials Science & Engineering department.

**Repeatable to:** 6 credits.

## ENNU489 Special Topics in Nuclear Engineering (3 Credits)

Selected topics of current importance in nuclear engineering.

**Restriction:** Permission of ENGR-Materials Science & Engineering department.

**Repeatable to:** 6 credits if content differs.

## ENNU609 Seminar in Nuclear Engineering (1 Credit)

## ENNU620 Mathematical Techniques for Engineering Analysis and Modeling (3 Credits)

Probability and probability distributions; statistics; ordinary differential equations; linear algebra and vectors; Laplace transform; Fourier analysis; boundary value problems; series solutions to differential equations; partial differential equations; numerical methods. Also offered as: ENRE620.

## ENNU633 Convective Transport Phenomena in Single- and Multi-Phase Systems (3 Credits)

Single medium - single phase systems, two-phase systems; Two media - solid-fluid systems: continuous interface, large interfacial area, fluid-fluid systems; Three media - solid-solid-fluid systems, solid-liquid-gas systems.

## ENNU643 Radiation Processing in Advanced Manufacturing (3 Credits)

Radiation processing facilities for industrial production - electron beam, gamma, x-ray; types of electron beam machines; radiation processing - yields, G-values, throughput, efficiency; radiation in advanced manufacturing; radiation sensors and dosimetry; sterilization of industrial products; radiation-physical technology.

## ENNU648 Special Problems in Nuclear Engineering (1-16 Credits)

### ENNU649 Selected Topics in Nuclear Engineering (1-3 Credits)

Topics of current interest in nuclear engineering.

**Prerequisite:** Permission of ENGR-Materials Science & Engineering department.

**Repeatable to:** 6 credits if content differs.

## ENNU652 Principles of Reliability Analysis (3 Credits)

Principal methods of reliability analysis, including fault tree and reliability block diagrams; Failure Mode and Effects Analysis (FMEA); event tree construction and evaluation; reliability data collection and analysis; methods of modeling systems for reliability analysis. Focus on problems related to process industries, fossil-fueled power plant availability, and other systems of concern to engineers.

**Prerequisite:** ENNU651. Also offered as: ENRE602.

## ENNU653 Mechanical Reliability of Materials (3 Credits)

Introduction to engineering materials; atomic structure; diffusion; defects; phase equilibria; kinetics and microstructures; deformations; fracture; materials testing; fatigue and creep; thermal properties; failure mechanisms; fractography; failure modeling.

**Prerequisite:** ENNU651.

## ENNU655 Radiation Engineering (3 Credits)

An analysis of such radiation applications as synthesizing chemicals, preserving foods, control of industrial processes, design of irradiation installations. E.G., Cobalt 60 gamma ray sources, electronuclear machine arrangement, and chemonuclear reactors.

**Restriction:** Permission of instructor; and permission of ENGR-Materials Science & Engineering department.

## ENNU799 Master's Thesis Research (1-6 Credits)

## ENNU898 Pre-Candidacy Research (1-8 Credits)

## ENNU899 Doctoral Dissertation Research (1-8 Credits)