

# CON Nuclr Engr Nuclear Engineering

Under Review | Fall 2023

## Proposal Information

### Status

Active

### Workflow Status

In Progress

#### Faculty Senate, Faculty Senate

expand ▲

Waiting for Approval | Faculty Senate Approval

Rick Holmes

Nancy Middlebrook

### Changes

- Concentration Requirements
- participants
- Concentration Description
- Proposed Effective Term and Year
- Catalog Activation Date

Show All ▼

## Proposal Information

Proposed

### Sponsoring faculty/staff member ⓘ

Adam Hecht

Proposed

### Sponsoring faculty/staff email

hecht@unm.edu

Existing

### Sponsoring faculty/staff member ⓘ

Existing

### Sponsoring faculty/staff email

### College

School of Engineering

### Department

Nuclear Engineering

### Campus

Main Campus

## Effective Term and Year

Proposed  
**Proposed Effective Term and Year**  
Fall 2023

Existing  
**Proposed Effective Term and Year**  
Fall 2006

## Justification

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Proposed

### **Concentration Justification**

Courses are not taught consistently for graduate students, to avoid multiple memos providing exceptions for other courses to count, the faculty voted to remove the choose two from this list. NE 525 was already an approved core course but didn't transfer over correctly and should have been listed. We would like to keep this course for our NE core requirement.  
Catalog updates 3/23 - hts

Existing

### **Concentration Justification**

## Associated Forms

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Select any associated course forms that exist

Select any associated program forms that exist

## Program Information

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### **Degree Name**

PhD Nuclear Engr - Doctor of Philosophy in Engineering

### **Degree Type**

Doctor of Philosophy

### **Program Type**

Doctoral

### **Program Description**

No Parent Selected

### **Degree Hours**

66

### **Minimum Major Hours**

## Degree Requirements

- Complete all of the following
  - Earn at least 48 credits from the following types of courses:  
The minimum amount of coursework required for the Doctor of Philosophy degree is 24 credit hours beyond the master's degree or 48 credit hours beyond the bachelor's degree. This requirement is exclusive of dissertation or master's thesis. These are minimum requirements; ordinarily, more than the 48 credit hours are necessary. The program of each student is an individual matter planned by the committee on studies.
  - See Concentration below for specific requirements.

**Grand Total Credits: 48**

## Concentration Information

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### Concentration Title

Nuclear Engineering

### Program Level

Graduate

### Concentration Requirements

- Complete all of the following
  - Earn at least 3 credits from the following:
    - NE501 - Nuclear Engineering Seminar (1)
  - Complete at least 2 of the following:
    - NE511—Advanced Nuclear Reactor Theory- (3)
    - NE520—Radiation Interactions and Transport- (3)
    - NE571—Radiation Damage in Materials- (3)
    - NE524—Interaction of Radiation with Matter- (3)
    - NE564—Thermal Hydraulics of Nuclear Systems- (3)
  - Complete the following:
    - NE525 - Methods of Analysis in Chemical, Biological, and Nuclear Engineering (3)

**Grand Total Credits: 6**

Proposed

## Concentration Description

### Information

The nuclear engineering research graduate programs at the University of New Mexico include nuclear criticality safety, radiation transport, reactor theory, single and two-phase flow in microgravity, space nuclear power, thermal-hydraulics, fusion energy, accelerator physics and engineering, occupational and environmental radiation protection, plasma physics, nuclear activation diagnostics, high energy density physics, reactor and shielding design, nuclear fuel irradiation behavior, theoretical and numerical methods in neutral and stochastic transport theory, charged particle transport, model-reference adaptive control of nuclear power plants, heat pipes for space application, computational methods for heat transfer and fluid flows, single phase laminar and combined flows, two-phase flows and probabilistic risk assessment.

The nuclear engineering laboratories are equipped with an AGN-201M nuclear training reactor; a hot cell facility with remote manipulators; a graphite pile; several solid-state detectors for alpha, beta and gamma radiation; computer-based data acquisition, analysis and control systems; and supporting radiation measurements systems. In addition to the well-equipped laboratories on campus, the advanced reactors and radiation equipment of Sandia National Laboratories, Los Alamos National Laboratory, Lovelace Respiratory Research Institute, and the Air Force Research Laboratory are utilized for instruction and research. The laboratories provide not only experimental facilities but access to high-performance supercomputers for carrying on advanced computational physics.

The department maintains a computer pod for student use, equipped with PCs with a wide selection of software.

Additional information on programs and facilities may be obtained by contacting either the graduate advisor or the department chairperson.

A GPA of 3.0 in the last two years of undergraduate study, and/or in previous engineering graduate study, is normally required for admission. In addition, the GRE is required of all Nuclear Engineering applicants.

### Course Requirements

In addition to the general University doctoral degree requirements listed in the Graduate Program section of this Catalog, students pursuing a Ph.D. in Engineering with a concentration in Nuclear Engineering must meet the following criteria:

1. The coursework applied to the degree must include a minimum of 18 credit hours of 500-level or higher courses.
2. A maximum of 6 credit hours of problems courses (NE 551/552) is allowed beyond the Master's degree.
3. All students are required to enroll in NE 501 every semester.
4. Up to 3 credit hours of NE 501 (not previously applied to the M.S.), or 6 credit hours total beyond the Bachelor's degree, may be applied toward the 48 credit coursework requirement for the Ph.D.
5. Students are required to complete the nuclear engineering core courses listed below. Otherwise, no specific courses are required for doctoral students. Courses are selected by the student in consultation with the research advisor and Committee on Studies.

Students admitted to the Ph.D. program with an M.S. degree in Nuclear Engineering from another institution may use equivalent graduate-level courses to satisfy the core requirements. These courses must be approved on a case-by-case basis by the Graduate Advisor in the Department of Nuclear Engineering.

Students admitted to the Ph.D. program with undergraduate or M.S. degrees in fields other than Nuclear Engineering may be required to take certain undergraduate background courses as determined by the Graduate Advisor.

**Comprehensive Examination:** The Comprehensive examination must be administered and passed before the Application for Candidacy form is approved by the program faculty and the Dean of Graduate Studies.

**Defense of Dissertation:** All candidates must pass a Final examination (Defense of Dissertation). The Dissertation Committee conducts the defense of the dissertation.

### Shared-Credit Undergraduate/Graduate Degrees Program

Undergraduate students in the School of Engineering may seek admission to the Ph.D. Concentration in Nuclear Engineering under the Shared-Credit Undergraduate/Graduate Degrees Program. See the School of Engineering section of this Catalog for specific admission information and requirements.

#### Interdisciplinary Program

Computational Science and Engineering: The Computational Science and Engineering interdisciplinary graduate certificate program prepares students to effectively use high-performance computing within their disciplines and is open to graduate students in this department. See the School of Engineering section of this Catalog.

Existing

#### **Concentration Description**

Contact the department for more information about this concentration.