Nuclear Engineering (BS)

To see more about what you will learn in this program, visit the Learning Outcomes website (https://apps.oirp.ncsu.edu/pgas/)

Nuclear engineers work in nuclear systems research, design, development, testing, operation, environmental protection, and marketing. The Bachelor of Science program prepares graduates for positions in industry, national laboratories, or for graduate study (consult the Graduate Catalog (http://www.ncsu.edu/grad/catalog/)). The curriculum incorporates basic sciences and engineering, with emphasis on mathematics and physics, followed by course work in nuclear science and technology. Design concepts are introduced in numerous nuclear engineering courses throughout the curriculum to provide an integrated educational experience, cap-stoned by senior nuclear projects involving reactors and radiation systems. Attention is also given to the efficient utilization of energy resources and to the environmental aspects of nuclear energy. Computers are widely used throughout the curriculum.

The nuclear engineering program is accredited by the Engineering Accreditation Commission of ABET, http://www.abet.org, and leads to the degree of Bachelor of Science in Nuclear Engineering. Advanced undergraduates who desire to attend graduate school at NC State may enter a combined 5-year BS/MNE professional program or BS/MS bachelor/master degree program during their senior year which will culminate at the end of their fifth year with both the Bachelor of Science in Nuclear Engineering and the Master of Nuclear Engineering or the Master of Science degrees, respectively.

Specific curriculum requirements are available online (https://www.acs.ncsu.edu/php/coursecat/degree_requirements.php). Information on health physics and nuclear engineering minors are available here (https://oucc.dasa.ncsu.edu/undergraduate-academic-programs/academic-minors/).

Plan Requirements
Nuclear Engineering (BS): 123 Total Units

First Year
Fall Semester

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Spring Semester

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Second Year
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| Advanced Communication Elective (p. ) | 3 |
| **Hours**                             | **16**|

Spring Semester

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Spring Semester

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Engineering Technical Elective (p.)  3

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1. A grade of C or higher is required.
2. A grade of C- or higher is required.

Total Hours 106

**Advanced Communication Elective**

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**NE Electives**

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**Technical Electives**

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**Engineering Technical Electives**

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<td>ISE 352</td>
<td>Fundamentals of Human-Machine Systems Design</td>
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<td>Deterministic Models in Industrial Engineering</td>
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<td>Dynamics &amp; Controls</td>
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<td>MSE 355</td>
<td>Electrical, Magnetic and Optical Properties of Materials</td>
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<td>Principles of Radiation Measurement</td>
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<td>Introduction to Plasma Physics and Fusion Energy</td>
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**Semester Sequence**

This is a sample.

**First Year**

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**Spring Semester**

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**Second Year**

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Advanced Communication Elective (p. 2) 3

**Spring Semester**

**MAE 208** Engineering Dynamics 3

**MA 341** Applied Differential Equations I 3

**NE 202** Radiation Sources, Interaction and Detection 4

GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) 3

GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) 3

**Hours** 16

**Third Year**

**Fall Semester**

**MAE 201** Engineering Thermodynamics I 3

**MA 401** Applied Differential Equations II 3

**NE 301** Fundamentals of Nuclear Engineering 3

**ISE 311** Engineering Economic Analysis 3

GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) 3

**Hours** 15

**Spring Semester**

**MAE 308** Fluid Mechanics 3

**MSE 201** Structure and Properties of Engineering Materials 3

**NE 400** Nuclear Reactor Energy Conversion 4

**NE 401** Reactor Analysis and Design 3

**NE 403** Nuclear Reactor Laboratory 2

GEP Health and Exercise Studies (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/gep-health-exercise-studies/) 1

**Hours** 16

**Fourth Year**

**Fall Semester**

**NE 402** Reactor Engineering 4

**NE 404** Radiation Safety and Shielding 3

**NE 406** Nuclear Engineering Senior Design Preparation 1

**NE Elective (p. 3)** 3

**Technical Elective (p. 3)** 3

**Hours** 14

**Spring Semester**

**NE 405** Reactor Systems 3

**NE 408** Nuclear Engineering Design Project 3

Engineering Technical Elective (p. 3) 3

GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) 3

GEP Requirement (http://catalog.ncsu.edu/undergraduate/gep-category-requirements/) 3

**Hours** 15

**Total Hours** 123

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1 A grade of C or higher is required.

2 A grade of C- or higher is required.

**Career Opportunities**

Nuclear power reactor operation continues with ninety eight reactors operating in the nation, increasing our reliance upon nuclear energy as a substitute for energy from fossil fuels. Development of advanced fission and fusion reactors offers the potential of vast new energy sources. Industrial and medical applications of radiation continue to increase in diverse industries. Demand for nuclear engineers is on the rise within the electric power industry and national laboratories, naval reactors, and other industries. According to the National Society of Professional Engineers, nuclear engineers are among the top five best compensated of the engineering disciplines.