The Radiation Sciences option is intended for students interested in medical and non-power applications. Students must have and are expected to maintain a 3.0 cumulative GPA. The following curriculum applies to students who entered the program starting in Fall 2022.

**SUMMARY OF REQUIREMENTS**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td><strong>Mathematics and Statistics</strong></td>
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<tr>
<td>MATH 221</td>
<td>Calculus and Analytic Geometry 1</td>
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<tr>
<td>or MATH 217</td>
<td>Calculus with Algebra and Trigonometry II</td>
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<tr>
<td>or MATH 275</td>
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<tr>
<td>MATH 222</td>
<td>Calculus and Analytic Geometry 2</td>
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<tr>
<td>or MATH 276</td>
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<tr>
<td>MATH 234</td>
<td>Calculus---Functions of Several Variables</td>
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<tr>
<td>MATH 320</td>
<td>Linear Algebra and Differential Equations</td>
<td>3</td>
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<tr>
<td>MATH 321</td>
<td>Applied Mathematical Analysis</td>
<td>3</td>
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<tr>
<td>STAT 324</td>
<td>Introductory Applied Statistics for Engineers</td>
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<tr>
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<tr>
<td><strong>Science</strong></td>
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<tr>
<td>CHEM 109</td>
<td>Advanced General Chemistry</td>
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<tr>
<td>CHEM 103 &amp; CHEM 104</td>
<td>General Chemistry I and General Chemistry II</td>
<td>5</td>
</tr>
<tr>
<td>PHYSICS 202</td>
<td>General Physics</td>
<td>5</td>
</tr>
<tr>
<td>or PHYSICS 208</td>
<td>General Physics</td>
<td>5</td>
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<tr>
<td>PHYSICS 241</td>
<td>Introduction to Modern Physics</td>
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<td><strong>Total Credits</strong></td>
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<tr>
<th>Code</th>
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<tbody>
<tr>
<td><strong>Engineering Science</strong></td>
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</tr>
<tr>
<td>ECE 376</td>
<td>Electrical and Electronic Circuits</td>
<td>3</td>
</tr>
<tr>
<td>or PHYSICS 321</td>
<td>Electric Circuits and Electronics</td>
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</tr>
<tr>
<td>EMA 201</td>
<td>Statics</td>
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<tr>
<td>EMA 202</td>
<td>Dynamics</td>
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<tr>
<td>or ME 240</td>
<td>Dynamics</td>
<td>3</td>
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<tr>
<td>EMA 303</td>
<td>Mechanics of Materials</td>
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<tr>
<td>or ME 306</td>
<td>Mechanics of Materials</td>
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<tr>
<td>EP 271</td>
<td>Engineering Problem Solving I</td>
<td>3-4</td>
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<tr>
<td>or COMP SCI 200</td>
<td>Programming I</td>
<td>3-4</td>
</tr>
<tr>
<td>or COMP SCI 220</td>
<td>Data Science Programming I</td>
<td>3-4</td>
</tr>
<tr>
<td>or COMP SCI 310</td>
<td>Problem Solving Using Computers</td>
<td>3-4</td>
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<tr>
<td>MEE 231</td>
<td>Geometric Modeling for Design and Manufacturing</td>
<td>3</td>
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<tr>
<td>MEE 361</td>
<td>Thermodynamics</td>
<td>3</td>
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<tr>
<td>MS &amp; E 350</td>
<td>Introduction to Materials Science</td>
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<td>Computing Elective (select one of the following):</td>
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<tr>
<td>COMP SCI 300</td>
<td>Programming II</td>
<td>3</td>
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<tr>
<td>COMP SCI 412</td>
<td>Introduction to Numerical Methods</td>
<td>3</td>
</tr>
<tr>
<td>EM A/E P 471</td>
<td>Intermediate Problem Solving for Engineers</td>
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</tr>
<tr>
<td>EM A/E P 476</td>
<td>Introduction to Scientific Computing for Engineering Physics</td>
<td>3</td>
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<td><strong>Total Credits</strong></td>
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<table>
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<tr>
<th>Code</th>
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<tr>
<td><strong>Radiation Sciences Core Requirement</strong></td>
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<tr>
<td>NE 305</td>
<td>Fundamentals of Nuclear Engineering</td>
<td>3</td>
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<tr>
<td>NE 405</td>
<td>Nuclear Reactor Theory</td>
<td>3</td>
</tr>
<tr>
<td>NE 408</td>
<td>Ionizing Radiation</td>
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</tr>
<tr>
<td>NE 412</td>
<td>Nuclear Reactor Design</td>
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<tr>
<td>NE 424</td>
<td>Nuclear Materials Laboratory</td>
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<tr>
<td>NE 427</td>
<td>Nuclear Instrumentation Laboratory</td>
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</tr>
<tr>
<td>NE 428</td>
<td>Nuclear Reactor Laboratory</td>
<td>2</td>
</tr>
<tr>
<td>NE 571</td>
<td>Economic and Environmental Aspects of Nuclear Energy</td>
<td>3</td>
</tr>
<tr>
<td>MED PHYS/</td>
<td>Radiation Physics and Dosimetry</td>
<td>3</td>
</tr>
<tr>
<td>B M E/H ONCOL/</td>
<td></td>
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<tr>
<td>PHYSICS 501</td>
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<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td><strong>Radiation Sciences Electives</strong></td>
<td></td>
<td>9</td>
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<tr>
<td>Medical Physics Electives</td>
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</tr>
<tr>
<td>Select credits from Medical Physics Electives Course List below</td>
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<td></td>
</tr>
<tr>
<td>Technical Electives (not to be confused with Medical Physics Electives) choose 2 credits from:</td>
<td></td>
<td>2</td>
</tr>
</tbody>
</table>
Nuclear Engineering: Radiation Sciences

N E 1 Cooperative Education Program (no more than 3 credits)
- Courses numbered 300+ in the CoE except for E P D/INTEREGR
- Courses numbered 300+ in MATH, PHYSICS, COMP SCI, STAT (except STAT 301), ASTRON, MED PHYS, and CHEM departments
- Students may also propose any class that they feel will benefit their education path with pre-requisite of two physics or calculus classes. For these courses the advisor will review the request and if approved, recommend a DARS substitution.

Total Credits 11

Medical Physics Electives Course List 1
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>MED PHYS/N E 506</td>
<td>Monte Carlo Radiation Transport</td>
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</tr>
<tr>
<td>MED PHYS/ B M E 566</td>
<td>Physics of Radiotherapy</td>
<td>3</td>
</tr>
<tr>
<td>MED PHYS/N E 569</td>
<td>Health Physics and Biological Effects 2</td>
<td>3-4</td>
</tr>
<tr>
<td>MED PHYS/ B M E 573</td>
<td>Mathematical Methods in Medical Physics</td>
<td>3</td>
</tr>
<tr>
<td>MED PHYS/ B M E 574</td>
<td>Data Science in Medical Physics</td>
<td>3</td>
</tr>
<tr>
<td>MED PHYS/ B M E 578</td>
<td>Non-Ionizing Diagnostic Imaging</td>
<td>4</td>
</tr>
<tr>
<td>MED PHYS/ B M E 580</td>
<td>The Physics of Medical Imaging with Ionizing Radiation</td>
<td>4</td>
</tr>
<tr>
<td>MED PHYS/ PHYSICS 588</td>
<td>Radiation Production and Detection</td>
<td>4</td>
</tr>
<tr>
<td>MED PHYS 671</td>
<td>Selected Topics in Medical Physics 2</td>
<td>1-4</td>
</tr>
<tr>
<td>MED PHYS 701</td>
<td>Ethics and the responsible conduct of research and practice of Medical Physics</td>
<td>1</td>
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</tbody>
</table>

Students are encouraged to access the online N E future course offering grid to plan their future course schedules and to confirm the offering of a course in the table.

INTRODUCTION TO ENGINEERING
<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
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</thead>
<tbody>
<tr>
<td>N E 231</td>
<td>Introduction to Nuclear Engineering</td>
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</table>

Total Credits 3

COMMUNICATION SKILLS
<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>ENGL 100</td>
<td>Introduction to College Composition</td>
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</tr>
<tr>
<td>or LSC 100</td>
<td>Science and Storytelling</td>
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<tr>
<td>or COM ARTS 100</td>
<td>Introduction to Speech Composition</td>
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<tr>
<td>or ESL 118</td>
<td>Academic Writing II</td>
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<tr>
<td>E P D 275</td>
<td>Technical Presentations</td>
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<tr>
<td>INTEREGR 397</td>
<td>Engineering Communication</td>
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</tr>
</tbody>
</table>

Total Credits 8

LIBERAL STUDIES ELECTIVES

College of Engineering Liberal Studies Requirements
- Complete Requirements (http://guide.wisc.edu/undergraduate/engineering/#requirementstext). 1

Total Credits 16

Students must take 16 credits that carry H, S, L, or Z breadth designators. These credits must fulfill the following subrequirements:
1. A minimum of two courses from the same subject area (https://registrar.wisc.edu/subjectarea/) (the description before the course number). At least one of these two courses must be designated as above the elementary level (I, A, or D) in the course listing.
2. A minimum of 6 credits designated as humanities (H, L, or Z in the course listing), and an additional minimum of 3 credits designated as social science (S or Z in the course listing). Foreign language courses count as H credits. Retroactive credits for language courses may not be used to meet the Liberal Studies credit requirement (they can be used for subrequirement 1 above).
3. At least 3 credits in courses designated as ethnic studies (lower case "e" in the course listing). These courses may help satisfy subrequirements 1 and 2 above, but they only count once toward the total required. Note: Some courses may have "e" designation but not have H, S, L, or Z designation; these courses do not count toward the Liberal Studies requirement.

For information on credit load, adding or dropping courses, course substitutions, pass/fail, auditing courses, dean’s honor list, repeating courses, probation, and graduation, see the College of Engineering Official Regulations (http://guide.wisc.edu/undergraduate/engineering/#policiesandregulationstext).

HONORS IN UNDERGRADUATE RESEARCH PROGRAM

Qualified undergraduates may earn an Honor in Research designation on their transcript and diploma by completing 8 credits of undergraduate honors research, including a senior thesis. Further information is available in the department office.