NUCLEAR ENGINEERING UNDERGRADUATE MAJOR (BS, HBS)

The objectives of the nuclear engineering and radiation health physics undergraduate curricula are to prepare students for careers related to the many beneficial uses of nuclear technology and energy. Nuclear engineers apply scientific principles to the research, design, and operation of a wide variety of nuclear technology applications including power generation, medicine, and radioactive waste management. Radiation health physicists study methods used to protect people and their environment from radiation hazards while enabling the beneficial uses of radiation and radioactive materials. In addition, an emphasis is provided in nuclear instrumentation, nuclear systems and materials, radiation protection, reactor analysis and nuclear power economics and, particularly, safety and regulation in nuclear operations.

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year Pre-Nuclear Engineering</td>
<td></td>
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</tr>
<tr>
<td>CH 201</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
<td>3</td>
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<tr>
<td>CH 202</td>
<td>CHEMISTRY FOR ENGINEERING MAJORS</td>
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<tr>
<td>COMM 111</td>
<td>*PUBLIC SPEAKING I</td>
<td>3</td>
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<tr>
<td>or COMM 114</td>
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<tr>
<td>HHS 231</td>
<td>*LIFETIME FITNESS FOR HEALTH</td>
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<tr>
<td>HHS 241</td>
<td>*LIFETIME FITNESS (or any PAC course)</td>
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<tr>
<td>MTH 251</td>
<td>*DIFFERENTIAL CALCULUS I</td>
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<tr>
<td>MTH 252</td>
<td>INTEGRAL CALCULUS I</td>
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<tr>
<td>MTH 254</td>
<td>VECTOR CALCULUS I</td>
<td>4</td>
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<tr>
<td>NSE 114</td>
<td>INTRO TO NUCLEAR ENGINEERING AND RADIATION HEALTH PHYSICS I</td>
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<tr>
<td>NSE 115</td>
<td>INTRO TO NUCLEAR ENGINEERING AND RADIATION HEALTH PHYSICS II</td>
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<tr>
<td>PH 211</td>
<td>*GENERAL PHYSICS WITH CALCULUS I</td>
<td>4</td>
</tr>
<tr>
<td>PHL 205</td>
<td>*ETHICS</td>
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<tr>
<td>WR 121</td>
<td>*ENGLISH COMPOSITIX</td>
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* Perspectives Courses: 2

| Second Year |                                                                     |       |
| ENGR 201    | ELECTRICAL FUNDAMENTALS I                                           | 3     |
| ENGR 211    | STATICS I                                                            | 3     |
| ENGR 212    | DYNAMICS I                                                           | 3     |
| ENGR 213    | STRENGTH OF MATERIALS                                                | 3     |
| MTH 256     | APPLIED DIFFERENTIAL EQUATIONS I                                    | 4     |
| MTH 306     | MATRIX AND POWER SERIES METHODS I                                   | 4     |
| NSE 233     | MATHEMATICAL METHODS FOR NSE                                         | 3     |
| NSE 234     | NUCLEAR AND RADIATION PHYSICS I                                     | 3     |
| NSE 235     | NUCLEAR AND RADIATION PHYSICS II                                    | 3     |
| NSE 236     | NUCLEAR RADIATION DETECTION AND INSTRUMENTEN                          | 4     |
| PH 212 & PH 213 |                                                   | 8     |

* Perspectives Courses: 2

<p>| Third Year |                                                                     |       |
| Professional Nuclear Engineering |                                                                     |       |
| Biological Science Elective |                                                                     | 4     |</p>
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>ENGR 248</td>
<td>ENGINEERING GRAPHICS AND 3-D MODELING</td>
<td>3</td>
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<tr>
<td>ENGR 321 or MATS 321</td>
<td>INTRODUCTION TO MATERIALS SCIENCE or INTRODUCTION TO MATERIALS SCIENCE</td>
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<tr>
<td>ENGR 390</td>
<td>ENGINEERING ECONOMY</td>
<td>3</td>
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<tr>
<td>NSE 311 or ME 311</td>
<td>INTRODUCTION TO THERMAL-FLUID SCIENCES or INTRODUCTION TO THERMAL-FLUID SCIENCES</td>
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<tr>
<td>NSE 312 or ME 312</td>
<td>THERMODYNAMICS or THERMC</td>
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<tr>
<td>NSE 331 or ME 331</td>
<td>INTRODUCTORY FLUID MECHANICS or INTRODUCTORY FLUID MECHANICS</td>
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<tr>
<td>NSE 332 or ME 332</td>
<td>HEAT TRANSFER or HEAT TRANSF</td>
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<tr>
<td>NSE 451</td>
<td>NEUTRONIC ANALYSIS I</td>
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<tr>
<td>NSE 452</td>
<td>NEUTRONIC ANALYSIS II</td>
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<tr>
<td>WR 327</td>
<td>*TECHNICAL WRITING 1</td>
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<td>*Perspectives Course</td>
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<tr>
<td>*Synthesis Course</td>
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<tr>
<th>Course Code</th>
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<th>Credits</th>
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<tbody>
<tr>
<td>NSE 407</td>
<td>SEMINAR (in Nuclear Engineering - 3 terms)</td>
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<tr>
<td>NSE 415</td>
<td>NUCLEAR RULES AND REGULATION</td>
<td>2</td>
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<tr>
<td>NSE 435</td>
<td>RADIATION SHIELDING AND EXTERNAL DOSIMETRY</td>
<td>4</td>
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<tr>
<td>NSE 457</td>
<td>NUCLEAR REACTOR LABORATORY</td>
<td>2</td>
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<td>NSE 467</td>
<td>NUCLEAR REACTOR THERMAL HYDRAULICS</td>
<td>4</td>
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<tr>
<td>NSE 473</td>
<td>NUCLEAR REACTOR SYSTEMS ANALYSIS</td>
<td>3</td>
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<tr>
<td>NSE 474</td>
<td>NUCLEAR SYSTEMS DESIGN I</td>
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<tr>
<td>NSE 475</td>
<td>NUCLEAR SYSTEMS DESIGN II</td>
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<tr>
<td>NSE 481</td>
<td>RADIATION PROTECTION</td>
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</tbody>
</table>

Restricted Electives: 8
*Synthesis Courses: 3
Free Elective: 3

Total credits required for graduation is 180
Total Hours: 44

* Baccalaureate Core Course (BCC)
^ Writing Intensive Course (WIC)
1 Required for entry into the professional program
2 Approved technical electives from departmental list
3 Must be selected to satisfy baccalaureate core requirements

Major Code: 327
Pre-Nuclear Engineering Major Code: 357