

NUCLEAR ENGINEERING DOCTORAL DEGREE COURSE PLAN – 78 CREDITS

Prerequisites may need to be taken prior to enrolling in these courses. Check www.uidaho.edu/registrar, catalogs.

| **Courses | Master's Degree in Nuclear Engineering | Degree in Physics or Chemistry | Degree in Mechanical Engineering | Degree in Chemical Engineering |
|---|--|--------------------------------|----------------------------------|--------------------------------|
| CORE | | | | |
| NE 450 Principles of Nuclear Engr | Not needed | Required | Required | Required |
| NE 565 Reactor Engr (Intermed NE) | Not needed | Required | Required | Required |
| ME 540 Continuum Mechanics | Strongly Encouraged | Strongly Encouraged | Required if not taken in M.S. | Strongly Encouraged |
| ME 541 Mechanical Engr Analysis | Required | Required | Required if not taken in M.S. | Required |
| SPECIALITY TRACKS | | | | |
| All students must select at least one specialty track | | | | |
| THERMOHYDRAULICS (TH) | | | | |
| Select at least 2 courses (including the required) | | | | |
| NE 504 Nuclear Heat Transport | Strongly Encouraged | | | |
| NE 570 Nuclear Chemical Engr | Strongly Encouraged | | | Required |
| NE 575 Adv Nuclear Power Engr | Required if not taken in M.S. | Required | Required | Required |
| NUCLEAR MATERIALS NM) | | | | |
| Select at least 2 courses (including the required) | | | | |
| ME 539 Adv Mech of Materials | | | | |
| NE 538 Fundamentals/Nuclear Mtrls | Required | Required | Required | Required |
| NE 537 Radiation Effects on Materials | Required | Required | Required | Required |
| NE 554 Radiation Det/Shielding | Strongly Encouraged | Strongly Encouraged | Strongly Encouraged | Strongly Encouraged |
| FUEL REPROCESSING (FR) | | | | |
| Select at least 2 courses (including the required) | | | | |
| NE 504 Molten Salt Technology | Required | Required | Required | Required |
| NE 582 Spent Nuclear Fuel Disp/Mgt | Required | Required | Required | Required |
| NE 585 Nuclear Fuel Cycles | | | | |
| THERMAL-FLUIDS | | | | |
| Select at least 2 courses (including the required) | | | | |
| ME 504 Advanced Heat Transfer | Strongly Encouraged | Strongly Encouraged | Strongly Encouraged | Strongly Encouraged |
| ME 520 Fluid Dynamics | Strongly Encouraged | Strongly Encouraged | Strongly Encouraged | Strongly Encouraged |
| NE 530 Two-Phase Flow | Optional | Optional | Optional | Optional |
| NUCLEAR CRITICALITY SAFETY | | | | |
| Select at least 3 courses (including the required). NCS certificate is also available in this area. | | | | |
| NE 535 Nuclear Criticality Safety I | Required | Required | Required | Required |
| NE 555 Nuclear Criticality Safety II | Required | Required | Required | Required |
| NE 533 Monte Carlo Methods | Strongly Encouraged | Strongly Encouraged | Strongly Encouraged | Strongly Encouraged |
| Advisor approved elective | | | | |
| | | | | |

| SUGGESTED ELECTIVES | Electives can be taken as part of the doctoral degree. | | | |
|--------------------------------------|--|---------------------|---------------------|---------------------|
| | Select from the list below and/or take any of the specialty track courses that are not in your focus area, check with your advisor before enrolling in elective courses. | | | |
| BUS 552 Mgt of Scientific Innovation | | | | |
| CHE 590 Hydrogen Energy Systems | | | | |
| CHE 515 Transport Phenomena | | | | |
| CHEM 550 Radioanalytical Chemistry | | | | |
| CS 511 Parallel Programming | | | | |
| CS 576 Data Mining Topics/Tech | | | | |
| EM 510 Engineering Mgt Fundmntls | | | | |
| ENVS 583 Water and Energy Systems | | | | |
| MATH 432 Numerical Linear Algebra | | | | |
| ME 513 Engineering Acoustics | | | | |
| ME 526 Statistical Thermodynamics | | | | |
| ME 583 Reliability of Engr Systems | | | | |
| ME 552 TechVentures:HiTech Entrp | | | | |
| NE 501 Seminar | Strongly Encouraged | Strongly Encouraged | Strongly Encouraged | Strongly Encouraged |
| NE 504 Fortran for Engineers | | | | |
| PHYS 550 Quantum Mechanics | Permission Required | Permission Required | Permission Required | Permission Required |
| PHYS 565 Particle/Nuclear Physics | Permission Required | Permission Required | Permission Required | Permission Required |
| PTTE 514 Nuclear Safety | | | | |
| PTTE 516 Nuclear Rules/Regulations | | | | |
| Advisor approved ISU courses | Check with advisor regarding equivalencies and limits on transfer credits before enrolling | | | |
| DISSERTATION | | | | |
| NE 600 Research and Dissertation | Required | Required | Required | Required |

*The 78 credits minimum is what it required as a baseline for a doctoral degree. Students who do not have a degree/background in their selected research area may need to take additional coursework in preparation for the dissertation research.

**Courses may be delivered live, web, Engineering Outreach or hybrid. Check course schedule for delivery.