University of Idaho

# College of Engineering
## Nuclear Engineering Program

## Course of Study Guide for the M.Engr. N.E. Degree (30 Credits)

**Core – 12 credits** Selected from the following list. (*All classes are 3 credit hours unless noted*)

| | |
|---|---|
| NE 450 | Principles of Nuclear Engineering |
| NE 501 | Seminar (1 cr., 2 cr. are required) |
| NE 544 | Reactor Analysis (statics and kinetics) |
| NE 554/Phys 506 | Radiation Detection and Shielding (ISU NSEN 608/609) |
| NE 565 | Reactor Engineering (ISU NSEN 605) |
| NE 585 | Nuclear Fuel Cycles (ISU NSEN g444) |
| Math 480 | Partial Differential Equations (or other advanced Math and/or Computer Modeling courses) |
| NSEN 447 | Nuclear Systems Laboratory (ISU) |

**Focus Areas – 18 credits** Selected from the following list.

- **Reactor Engineering, Control & Safety Focus**
  - CHE/ME 527 Thermodynamics
  - CE/ME 519 Fluid Transients
  - CE 541/ME 583 Reliability of Engineering Systems
  - ChE/ME 541 Advanced Engineering Analysis
  - CS 430 System Modeling and Simulation
  - ECE 470/ME 481 Control Systems
  - ME 435 Thermal Energy System Design
  - ME 477/577 Design for Manufacture Assembly
  - ME 520/CHE 537 Fluid Dynamics
  - ME 546 Convective Heat Transfer
  - ME/ChE 525 Advanced Heat Transfer
  - NE 462 Nuclear Reactor Codes and Standards
  - NE 525 Transport Theory
  - NE 530 Two Phase Flow (ISU NSEN 625)
  - NE 575 Advanced Nuclear Power Engineering (ISU NSEN 615)

- **Reactor Fuels, Chemical Engineering & Chemistry, and Materials Focus**
  - ChE 423 (Chemical) Reactor Kinetics and Design
  - ChE 480/580 Engineering Risk Assessment Hazardous/Radioactive Waste
  - ChE 529 Chemical Engineering Kinetics
  - ChE/ME 515 Transport Phenomena
  - ChE/Me 528 Advanced Thermodynamics
  - MSE 415 Materials Selection and Design
  - MSE 423/523 Corrosion
  - MSE 428/528 Advanced Engineering Ceramics
  - MSE 534 Radiation Effects in Materials
  - MSE/ME 535 Failure of Structural Materials
  - MSE 550 Nuclear Reactor Fuels
  - NE 570 Nuclear Chemical Engineering
  - NE 580 Waste Management and Nuclear Fuel Reprocessing
  - NE 581 Treatment of Radioactive Wastes (ISU NSEN 618/619)
  - NE 582 Spent Nuclear Fuel Management and Disposition

- **Individualized Option** – custom develop your own (*15 credit hours of approved study*)

Advanced Math, Science, or Engineering courses may be used as technical electives with approval of the student's committee. This degree is a minimum of 30 semester hours. Students may transfer in up to 12 graduate credits completed at other

accredited universities, subject to university regulations and the approval of the student's graduate committee members. Students must have at least 3 courses (9 credits) in a single focus area to demonstrate depth in study.