

Undergraduate Degree Programs

Our core discipline combines engineering, modern physics, mathematics and computational skills configured in either a structured or flexible program.

Common Requirements

Core Subjects

- 18.03 Differential Equations**, 12
- 22.01 Intro to Nuclear Eng. & Ionizing Radiation**, 12
- 22.04 Social Problems of Nuclear Energy (HASS-S)**
- 2.005 Thermal-Fluids Engineering I**, 12
- 22.09 Principles of Nuclear Radiation Measurement & Protection**, 15 (CI-M)

Computational Requirement, 12 units, one of:

- 1.000 Intro to Programming & Numerical Methods
- 2.086 Numerical Computation for Mechanical Eng.
- 12.010 Comp Methods of Scientific Programming
- 22.C25 Real World Computation with Julia
- 6.100A + 6.100B Intro Computer Sci. & Programming

Math Elective Requirement, 12 units, one of:

- 6.3700 Probabilistic Systems Analysis (6.041)
- 18.04 Complex Variables with Applications
- 18.05 Introduction to Probability and Statistics
- 18.06 Linear Algebra
- 18.075 Methods for Scientists and Engineers
- 18.600 Probability and Random Variables

Bachelor of Science in Nuclear Science and Engineering/Course 22

Degree-specific Requirements

- 22.02 Introduction to Applied Nuclear Physics**, 12
- 22.033 Nuclear Systems Design Project**, 15
- 22.05 Neutron Science and Reactor Physics**, 12; pre: 18.03, 22.01, math elective
- 22.06 Engineering of Nuclear Systems**, 12; pre: 2.005
- 22.061 Fusion Energy**, 12; pre: 22.01
- 22.ThT Undergraduate Thesis Tutorial**, 3 units
- 22.ThU Undergraduate Thesis**, 9+ units, CI-M; pre or co: 22.ThT

Materials Science and Physics Elective, one of:

- 1.050 Solid Mechanics**, 12, pre: Physics I (GIR), Calculus II (GIR)
- 2.001 Mechanics and Materials I**, 12, co: 2.087 or 18.03
- 3.010 Structure of Materials**, 12, pre: Chemistry (GIR); co: 18.03
- 3.013 Mechanics of Materials**, 12, pre: Physics I (GIR); co: 18.03
- 8.03 Physics III**, 12, REST; pre: Physics II (GIR), Calculus II (GIR)

Restricted Electives in NSE: 12 UNITS (*graduate subjects may be petitioned*)

- 22.022 Quantum Theory of Radiation Interaction, 12, 22.02
- 22.039 Integration of Reactor Design, Ops & Safety, 12, 22.05 and 22.06
- 22.051 Systems Analysis of the Nuclear Fuel Cycle, 12, 22.05
- 22.055 Radiation Biophysics, 12
- 22.071 Electronics, Signals & Measurement
- 22.072 Corrosion: The Environmental Degradation of Materials, 12
- 22.081J Sustainable Energy, 12
- 2.006 Thermal-Fluids Engineering II, 12, 2.005 or 2.051
- 3.14 Physical Metallurgy, 12, 3.022 and 3.032

Unrestricted Electives

48

Total Units Beyond the GIRs Required for SB Degree

186

Bachelor of Science in Engineering/Course 22-ENG (the Flexible Track)

Degree-specific Requirements

System Specialization, one of:

- **22.06 Engineering of Nuclear Systems**, 12; pre: 2.005
- **22.061 Fusion Energy**, 12; pre: 22.01

Senior Project, one of:

- **22.ThT Thesis Prep + 22.ThU Undergraduate Thesis**, 15 units total
- **22.033 Nuclear Systems Design Project**, 15

Focus Area

Choose your own individual focus area & the subjects to fulfill it.

72 units, self-selected and approved via proposal to the department

Examples:

Fusion/Nuclear Physics: 8.03, 8.04, 8.07, 8.21, 8.276, 6.013, 22.611, 22.02

Medical Applications: 5.60, 8.241, 20.110/2.772, 20.310/3.053, 6.003, 20.345

Energy Systems: 22.071, 8.21, 15.2191 or 14.44*, 1.020, 22.081, 2.60, EC.711

Modeling & Simulation: 22.00, 6.034, 6.041, 6.009, 6.031, 6.036, IDS.013

Policy & Economics: STS.082, 17.393, 1.286, 14.44*, 14.42*, 12.348, 12.349

Quantum Science: 22.02, 8.03, 8.04, 8.05, 8.06, 8.223, 22.022

Quantum Computing: 2.110, 8.370, 3.021, 18.436, 6.042, 6.045, 18.404

Nuclear Materials: 3.012, 3.014, 3.032, 3.042, 22.074, 22.054, 3.14, 3.18

Unrestricted Electives

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Total Units Beyond the GIRs Required for SB Degree

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