

Nuclear Engineering Option

The Nuclear Engineering Option is a special emphasis for the Mechanical Engineering discipline in which the coursework is incorporated into the Technical Electives. The Nuclear Engineering Option provides the background that mechanical engineering students need for employment in nuclear engineering.

Mechanical Engineering majors declare the Nuclear Engineering Option by filling out the [Nuclear Engineering Option Declaration Form](#), found on the MNE Advising website: <https://www.mne.k-state.edu/student-success/advising/>.

Mechanical Engineers

Research, develop, design, manufacture and test tools, engines, machines, and other mechanical devices

- Work on power-producing machines such as electricity-producing generators, internal combustion engines, steam or gas turbines, jet and rocket engines
- Develop power-using machines such as refrigeration and air-conditioning equipment, robots used in manufacturing, machine tools, materials handling systems, and industrial production equipment
- Design tools needed by other engineers

Nuclear Engineers

Nuclear engineers research and design nuclear energy systems and other systems that utilize radiation.

- Design, develop, monitor, and operate nuclear plants
- Work on the nuclear fuel cycle-production, handling, and use of nuclear fuel and safe disposal of nuclear waste or fusion energy
- Develop nuclear power sources such as those used in spacecraft
- Develop industrial and medical uses for radioactive materials, such as equipment to diagnose and treat medical problems

Nuclear Engineering Option Benefits

Higher Salaries

U.S. Department of Labor Statistics, median annual wage (2022)

- Mechanical engineer \$100,820
- Nuclear engineer \$124,540

Scholarships

K-State Nuclear Engineering Option students compete well in undergraduate scholarship programs of the American Nuclear Society and the Department of Energy. Awards are typically \$2,000 to \$7,500 per year.

Nuclear Industry Jobs

America's nuclear power industry supports 475,000 direct and secondary full-time jobs (Nuclear Energy Institute 2019).

Focused, Flexible Curriculum

The Nuclear Engineering Option is a natural complement to the mechanical engineering major. Core courses for the Nuclear

Engineering Option include:

- NE 495 – Elements of Nuclear Engineering (*Required for all MNE students*)
- NE 690 – Radiation Protection Shielding
- NE 612 – Principles of Radiation Detection
- NE 630 – Nuclear Reactor Theory
- NE 648 – Nuclear Reactor Lab

Nuclear Reactor Operator Training

A technical elective, NE 350 – Reactor Operations Laboratory, is offered for students interested in the operational aspects of nuclear reactors. Additionally, the K-State Nuclear Reactor Facility offers part-time student positions. Student staff assist in the maintenance and operations of the K-State TRIGA Mark II Nuclear Reactor, a 1250 kW licensed research reactor capable of short bursts up to 1400 MW. The Nuclear Regulatory Commission licenses reactor operators – obtaining a license and operating a reactor is an outstanding way to see theory put into practice and gain valuable hands-on nuclear experience. For additional information, visit: www.mne.k-state.edu/research/reactor/.

Other nuclear engineering opportunities at K-State:

Computation and Optimization for Reactor Physics Simulation: <https://www.k-state.edu/corps/>

Radiological Engineering Analysis Laboratory: <https://www.facebook.com/REALKSU>

Radiological Systems Integration Lab: <https://www.mne.k-state.edu/research/rsil/>

S.M.A.R.T. Lab: <http://smartlab.mne.ksu.edu/>