



BECOME A LEADER IN NUCLEAR PACKAGING AND RELATED FIELDS

Earn a Graduate Certificate in Nuclear Packaging from the University of Nevada, Reno Mechanical Engineering Department

Supported by the U.S. Department of Energy Packaging Certification Program and DOE National Laboratories



WHAT IS THE GRADUATE CERTIFICATE IN NUCLEAR PACKAGING (GCNP) PROGRAM?

The University of Nevada, Reno (UNR) Mechanical Engineering (ME) Department offers a 9-credit Graduate Certificate in Nuclear Packaging (GCNP). The program is regionally accredited by the Northwest Commission of Colleges and Universities (NWCCU).

This applied-knowledge-based program has been supported by the U.S. Department of Energy (DOE) Packaging Certification Program (PCP) since 2013.

For a complete description, see <https://www.unr.edu/degrees/nuclear-packaging/certificate>

PROGRAM GOAL

- The goal of the program is to provide mechanical, materials, and nuclear engineers with the applied knowledge and skills they require to succeed as nuclear packaging designers, analysts, and users.

CURRICULUM AND INSTRUCTION

- The core curriculum has three required courses, which comprise 4 credits. The content of these courses is the foundation for all professionals working in the area of nuclear packaging safety and security.
- Students tailor the curriculum to meet their specific needs and interests by choosing 5 elective credits from 13 course choices. Program staff are developing additional electives.
- Subject matter experts at U.S. National Laboratories teach 7 of the elective choices. UNR's ME and Materials Science and Engineering (MSE) Department faculty teach the other six.

HOW WOULD I BENEFIT FROM THE PROGRAM?

Completing the program will give you a competitive advantage when seeking employment or promotion in nuclear packaging and other related fields. Plus, you will gain the knowledge and practical experience you need to excel in the nuclear packaging industry.

AS A PACKAGING SYSTEM ENGINEER/MANAGER, THE PROGRAM WILL HELP YOU:

- Be familiar with relevant *Code of Federal Regulations* (CFR) for the transport and storage of radioactive materials, including spent nuclear fuel and high-level waste, using a graded approach for packaging structures, systems, and components (SSCs).
- Understand how to apply the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code related to nuclear packaging.
- Be able to prepare a Safety Analysis Report for Packaging (SARP).
- Know how to apply Quality Assurance methods to package design and operating procedures.

AS A PACKAGE DESIGNER/REVIEWER OR ANALYST, THE PROGRAM WILL HELP YOU ENHANCE YOUR:

- Expertise in one or more SARP technical areas or skills in the preparation and review of SARPs.
- General knowledge of all the other SARP technical areas, to ensure that the overall system meets its design objectives and satisfies regulatory safety standards.

AS A USER OF PACKAGES, THE PROGRAM WILL HELP YOU KNOW:

- How to enact all Operating Procedures, Acceptance Tests and Maintenance, and Quality Assurance requirements prescribed in the SARP and conditions of approvals in the Certificate of Compliance.

WHAT MAKES THIS PROGRAM UNIQUE?

NUCLEAR PACKAGING INTERNSHIP

One unique component of the program is the Nuclear Packaging Internship (ME 699). During the internship, you will have the opportunity to develop and demonstrate independent use of engineering skills for professional project planning, performance, and communications at a DOE National Laboratory or industry site, under the direct supervision of a packaging professional. For more details about the internship, see <https://www.unr.edu/me/graduate-program/nuclear-packaging-certificate/nuclear-packaging-internships>.

TAILORED CURRICULUM

The current curriculum allows credit from courses offered by Argonne, Lawrence Livermore, Oak Ridge, Sandia, and Savannah River National Laboratories and UNR. In these courses, you'll join a community of professionals from government agencies, National Laboratories, and the nuclear industry, from both inside and outside the United States, as well as university students. Participants in these classes have undergraduate or higher degrees.

OVERSIGHT

Annually, a board of experienced industry and government packaging professionals and supervisors conducts a review of the GCNP program to identify improvements and ensure the program's relevance and effectiveness.

WHAT ARE THE ADMISSION REQUIREMENTS?

Before enrolling in the GCNP, you need to have earned either

- A baccalaureate degree in mechanical, materials, or nuclear engineering or a closely related field or
- A baccalaureate degree and background in project management related to nuclear and radioactive materials packaging.

WHAT ARE THE PROGRAM REQUIREMENTS?

To earn the GCNP, you'll need to complete 3 required courses: ME 691, ME 692, and ME 695 (for more about the courses, see table below). DOE National Laboratories offer all of them. You'll also need to obtain 5 additional credits from the elective courses.

To earn the GCNP, you'll need to:

- Gain admission to UNR,
- Pay UNR tuition and fees (in addition to the registration fees collected by the DOE National Laboratory),

- Earn a C grade or better in each required and elective class (based on class assignments and a final exam) and an average grade (weighted based on course credits) of B or better, and
- Complete the 9-credit certificate curriculum in 6 years or less.

Even if you don't complete the certificate, you can still use completed coursework credits toward selected graduate degrees at UNR or at other universities that accept them.

WHAT COURSES ARE OFFERED?

The following table provides the course numbers, titles, credit values, locations, and required/elective designations of the ME and MSE courses that are part of the GCNP.

COURSE NUMBER	COURSE TITLE	CREDIT	LOCATION*	REQUIRED OR ELECTIVE
NP 600	American Society of Mechanical Engineers (ASME) Pressure Vessel Code for Nuclear Transport and Storage	1	ANL	Required
NP 601	Quality Assurance (QA) for Radioactive Material Packaging and Storage Casks	1	ANL	Required
NP 602	Safety Analysis Report for Packaging (SARP) Review and Confirmatory Analysis	2	LLNL	Required
NP 603	Management of Safety Analysis Report for Packaging (SARP) Preparation	1	SRNL	Elective
NP 605	Thermal Modeling and Testing of Radioactive Materials (RAM Packages)	1	SNL	Elective
NP 607	Radiation and Nuclear Criticality Analysis of Radioactive Materials (RAM) Packages	1	ORNL	Elective
NP 608	Radioactive Material Package Operations and Leak Testing	1	SRNL	Elective
NP 610	Nuclear and Other Radioactive Materials Transport Security – Domestic	1	ANL	Elective
NP 611	Nuclear and Other Radioactive Materials Transport Security – International	1	ANL	Elective
NP 640	Nuclear Packaging Internships	3	DOE sites, DOE labs, or industry	Elective
ME 675	Introduction to Combustion	3	UNR	Elective
MSE 601	Corrosion of Metals	3	UNR	Elective
MSE 665	Nuclear Power Fundamentals	3	UNR	Elective
MSE 666	Nuclear Fuel Cycle	3	UNR	Elective
MSE 667	Radiation Detection and Measurement	3	UNR	Elective
MSE 668	Nuclear Materials	3	UNR	Elective

*For current course schedule and locations, see <https://rampac.energy.gov/home/education/packaging-university#FY2020>

ANL Argonne National Laboratory

LLNL Lawrence Livermore National Laboratory

ORNL Oak Ridge National Laboratory

SNL Sandia National Laboratories

SRNL Savannah River National Laboratory

UNR University of Nevada, Reno



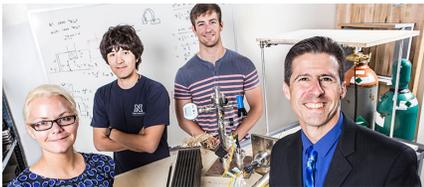
“The certificate program was extremely helpful and provided me with a variety of information, tools, and contacts needed to help guide me through my career as a nuclear packaging engineer,” said Daniel Perlstein, who, in 2017, became the first student to receive the GCNP. *“I am extremely grateful for the opportunity to participate in the program. If it wasn’t for the nuclear packaging program, it would have taken at least 4 or more years to gain the same amount of experience in the field.”*

**FORMERLY STAFF ENGINEER AT NEVADA NATIONAL SECURITY SITE
AND CURRENTLY STAFF AT LOS ALAMOS NATIONAL LABORATORY**



“From DOE’s perspective, I strongly support this innovative program. A robust curriculum and hands-on experience give students a unique opportunity to fast-track their careers in nuclear packaging. As a result, these students are among the best-qualified and best-prepared professionals for tackling complex problems in nuclear packaging – and will be trusted leaders who have the skills to help ensure our nation’s safety and security.”

**DR. JAMES SHULER, MANAGER, DOE PACKAGING CERTIFICATION PROGRAM,
U.S. DEPARTMENT OF ENERGY, OFFICE OF PACKAGING AND TRANSPORTATION**



“The Graduate Certificate in Nuclear Packaging is an applied-knowledge-based program that helps mechanical, nuclear, materials and other engineers qualify and excel as nuclear packaging engineers, which are currently in short supply. Student feedback about the program has been very favorable.”

**DR. MILES GREINER, FOUNDATION PROFESSOR AND CHAIR OF MECHANICAL
ENGINEERING, UNIVERSITY OF NEVADA, RENO**



“As Co-Principal Educator of the GCNP program with Professor Greiner and Manager of the Packaging Certification and Life Cycle Management Group at Argonne National Laboratory, I find it personally very gratifying that we are able to support Dr. Shuler’s vision by adapting the DOE Packaging Certification Program’s training courses developed by Argonne and other National Labs for the education and training of the next-generation professionals in nuclear packaging.”

**DR. YUNG LIU, SENIOR NUCLEAR ENGINEER & MANAGER,
PACKAGING CERTIFICATION & LIFE CYCLE MANAGEMENT GROUP,
ARGONNE NATIONAL LABORATORY**

HOW DO I APPLY?

For more information regarding admission and application to the University program, please refer to the link,

<http://www.unr.edu/grad/admissions/special-requirement-categories>.

CONTACT

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