



Summer School

Radiation Detection for Nuclear Security

Pacific Northwest National Laboratory is pleased to offer a tailored summer school course that emphasizes the need for radiation detection in nuclear security. The course will provide students with a unique understanding of nuclear security challenges faced by operators in the field and expose students to the technical foundations, analysis, and insight that will be required by future leaders in technology development and applications relevant to nuclear security missions. The course will heavily emphasize laboratory and field demonstrations, including direct measurements of special nuclear material, and students will attend seminars given by top experts in nuclear security. Enrollment will be limited to approximately 16 students for this 2-week summer school that combines lectures, real-world technology demonstrations, and tours of operational facilities with relevance to nuclear security.



This third installment of the summer school is funded by NNSA's Office of Nonproliferation and Verification Research and Development.



Students observe ultra-pure copper materials in PNNL's Shallow Underground Laboratory.

There is no charge for the course, but students are responsible for transportation to and from the class, meals and lodging. Information on local airports, rental agencies, public transportation and available lodging will be provided. Students are invited to deliver a 15-minute presentation on their thesis research and/or a topic related to the summer course theme.

A 2-week hands-on summer school for graduate and advanced undergraduate students (June 16 - 27, 2014)

- Nuclear security missions and their real-world constraints
- Restricted to the role that radiation detectors play in nuclear security.
- Explores the interface of technology, policy and operations



Course Outline & Activities



Week 1 – Foundations

Lectures include

- Fundamentals of Radiation Detection
- Gamma-ray Spectroscopy
- Neutron Multiplicity Counting
- Nuclear Fuel & Enrichment

Activities include

- Modeling Source Terms
- Detector Sensitivity vs. Selectivity
- Neutron Moderation

Week 2 – Applications

Lectures include

- Nuclear Safeguards
- Arms Control & Treaty Verification
- Interdiction
- Emergency Response

Activities include

- Border Guard Training
- Tours of AREVA Fuel Fabrication Plant & Hanford B Reactor

Student Testimonials ...

"The PNNL tours were among the best part of the course. Aside from the fact that they were a lot of fun and interesting, they allowed us to see what current technology specs were at, what requirements were being looked into, and what the current concerns of research in the field are."

"All of the different guest lectures given by great names in the individual fields. It was also really cool hearing about what other students are doing out there in the world of research and how those skills could be used in a security capacity."

Eligibility

The course is designed for graduate students in science and engineering programs and interest in careers within the US national laboratory system or federal government agencies responsible for nuclear security. Experienced upper-level undergraduates will also be considered. Special consideration will be given to students whose research is funded by NNSA's Office of Nonproliferation and Verification R&D (NA-22), and students performing research in fields with potential nuclear security applications.

Only US citizens are eligible for this course.

Instructors

Robert C. Runkle is a nuclear physicist, James E. Baciak is a nuclear engineer and Mitchell L. Woodring is a scientist.

For More Information

For more information, or to request an application, please visit: PNNL's RDNS Summer School website (http://science-ed.pnnl.gov/students_graduates/RDNS.stm)

or contact: Robert Runkle
Pacific Northwest National Laboratory
Phone: (509)375-1966, robert.runkle@pnnl.gov

- Applications are due March 14, 2014 -

About PNNL

Pacific Northwest National Laboratory is a Department of Energy Office of Science national laboratory where interdisciplinary teams advance science and technology and deliver solutions to America's most intractable problems in energy, the environment and national security. PNNL employs 4,300 staff, has an annual budget of nearly \$936M, and has been managed by Ohio-based Battelle since the lab's inception in 1965.



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