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For more information consult the following web site:  
[www.bnl.gov/education/nnss](http://www.bnl.gov/education/nnss)

Questions can be sent to  
[nnss@bnl.gov](mailto:nnss@bnl.gov)



## Nuclear Nonproliferation, Safeguards, and Security (NNSS) in the 21st Century

Brookhaven National Laboratory  
June 11- June 29, 2012

### ELIGIBILITY REQUIREMENTS

Applicants must:

- be 18 years or older
- have valid medical insurance for the duration of the course
- be in or entering graduate school or have recently completed graduate school

### APPLICATION REQUIREMENTS

- Completed application form found at [www.bnl.gov/education/nnss](http://www.bnl.gov/education/nnss)
- Official transcripts of your undergraduate and graduate records
- Two letters of recommendation

The completed application form can be sent by regular mail or as an e-mail attachment to:

NNSS Course  
Brookhaven National Laboratory  
Building 197C  
P.O. Box 5000  
Upton, New York 11973  
[nnss@bnl.gov](mailto:nnss@bnl.gov)

Official transcripts and original letters of recommendation should be mailed to the same address

### APPLICATION DEADLINES

Applications, transcripts, and letters of recommendation must be received by March 2, 2012.

Applicants will be notified of the outcome of the selection process by March 23, 2012.

Successful applicants will receive

- Housing at or near Brookhaven National Laboratory during the period of the course
- Approximately \$1,000 to cover the costs of meals, incidentals, travel to the Laboratory, and other expenses



**BROOKHAVEN**  
NATIONAL LABORATORY

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# Nuclear Nonproliferation, Safeguards, and Security in the 21st Century



*A Course for Prospective, Current, and Recent Graduate Students in the Physical Sciences, Engineering, and International Relations*

2012

Cover photo—Kirstie Hansen/IAEA

Nonproliferation and National Security Department



## Nuclear Nonproliferation, Safeguards, and Security in the 21st Century

A Course for Prospective, Current, and Recent Graduate Students in the Physical Sciences, Engineering, and International Relations

Since the end of the Cold War, U.S. nuclear security policy and planning have had to adapt to a rapidly changing environment. The “traditional” risk of nuclear proliferation – additional nation-states acquiring nuclear weapons or unsafeguarded nuclear material – remains. But it has been compounded by the threat that “loose nukes” or improvised nuclear devices could find their way to American cities, brought in by sub-national terrorist groups. Such groups also could use radioactive materials, widely used for important health and industrial purposes, to detonate a radiological dispersal device.

In the past, nonproliferation has often been viewed from the perspective of haves and have-nots, nuclear weapon states and non-nuclear weapon states, states with advanced nuclear fuel cycles and those without, developed and developing countries. Today the boundaries are blurred. The clandestine diffusion of centrifuge design and manufacturing data demonstrates that suppliers in low or middle-income

countries can supply sophisticated nuclear products. An advanced nuclear fuel cycle is not needed. Indeed, no fuel cycle at all is necessary for a state to become part of the nuclear proliferation problem. And states are no longer the only threat, as terrorists have convincingly demonstrated.

The emergence of new proliferating states and a more pronounced terrorist threat has led to important adaptations in the last dozen years to the tools used to combat nuclear proliferation – treaties, institutions, multilateral arrangements, and technology controls.

The safeguards applied by the International Atomic Energy Agency (IAEA) remain an important element in deterring proliferation. The IAEA has adopted a new model safeguards agreement (the Model Additional Protocol) to improve its ability to detect undeclared activities and has shifted its focus from facilities to states. Its new state level approach incorporates information from many sources, including export data and satellite imagery. The United Nations Security Council adopted Resolution 1540 to prompt states to put in place controls on items related to weapons of mass destruction in order to reduce the risk of terrorists acquiring these powerful weapons. A number of new bilateral and multilateral programs such as the Cooperative Threat Reduction Program (CTR), the Global Threat Reduction Initiative, and the Container Security Initiative have started.

Nonetheless, many believe that the nuclear nonproliferation regime needs to be strengthened and that it needs to be integrated with strengthened efforts to reduce the terrorist threat. At the same time, the United States is facing the erosion of its own intellectual infrastructure of specialists equipped to address the challenge of nuclear proliferation.

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**This course is designed to give students a sound understanding of the foundations of the nuclear nonproliferation regime, the IAEA safeguards system and U.S. efforts to meet emerging nuclear proliferation threats. The course will present students with critical assessments of current nonproliferation arrangements. With exercises and demonstrations, the course will introduce students to the techniques and technologies of international safeguards and detection of nuclear and other radioactive materials. Above all, the course aims to give participants the knowledge, analytic tools, and motivation to contribute to improvement of the nonproliferation regime.**

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## Organizations for Positions and Careers in Nuclear Nonproliferation, Safeguards, and Security

### International Atomic Energy Agency (IAEA)–

Located in Vienna, Austria, the IAEA is the international organization charged with nuclear safeguards verification.

Both coordinators of the course served as staff members of the IAEA.

**U.S. Department of Energy National Nuclear Security Administration (DOE NNSA)**–Located in Washington, D.C., DOE NNSA supports many programs that foster nuclear nonproliferation worldwide, giving policy direction and budgetary support. Its Office of Nonproliferation & International Security is the sponsor of the course.

**The U.S. Department of State, Nuclear Regulatory Commission, Department of Defense, and Agencies of the Intelligence Community** all play a role in nuclear nonproliferation. One coordinator of the course served as a staff member of the Department of State.

**The U.S. Department of Homeland Security** has programs to improve the capability of the U.S. to detect and report unauthorized attempts to use nuclear or radiological material against the U.S. The same coordinator of the course currently serves there.

**U.S. DOE National Laboratories**–Many DOE national laboratories pursue research and development in nuclear energy and its applications and in nonproliferation and safeguards. These national laboratories include Argonne, Brookhaven, Idaho, Lawrence Livermore, Los Alamos, Oak Ridge, Pacific Northwest, Sandia and Savannah River.

**Universities**–Many universities with nuclear engineering departments, with graduate programs in international relations, or with specialized institutes focusing on the interaction of science and public policy have professors who follow nonproliferation and safeguards issues and contribute to policy formulation and debate.

**Non-Government Organizations (NGOs)**–Located primarily in Washington, D.C., several NGOs specialize in nonproliferation and safeguards or have staff members who work in these areas as do university professors. Notable are the **Nuclear Threat Initiative, the Arms Control Association, and the Carnegie Endowment for International Peace.**



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Vadim Mouchkiri/IAEA