The National Strategic Research Institute at the University of Nebraska proudly offers real-world, multi-disciplinary training scenarios for responding to and preventing chemical, biological, radiological, nuclear and explosive weapons incidents.

Courses are taught at the NSRI National Capital Region Laboratory and Conference Center, a state-of-the-art, 10,000-square-foot facility in Annapolis Junction, Md. The courses can also be offered at your location via our mobile training program.

In addition to our listed courses, NSRI offers tailored courses to suit individual client needs. Often times, custom courses are delivered based on unique client capabilities, mission requirements or parameters.

EXTENDED DETAILS & REGISTRATION
nsri.nebraska.edu/training

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WE’RE READY.

NSRI instructors are seasoned subject matter experts in their respective fields and come to the institute with decades of experience.

**Wes Carter**  
Research Director  
21 years of DOD experience with primary focus in WMD training and response

**Daniel Polanski**  
Deputy Director  
25 years of government service with 18+ years working WMD arena

**Paul Brantmier**  
Senior Program Manager  
22 years in public health and government and military service with 12 years specifically in CBRN WMD

**Marty Sikes III**  
Operations Manager  
4 years supporting the development and execution of mass casualty and terrorist response exercises

TEAM BIOS  
nsri.nebraska.edu/training
CHEMICAL COURSES

PHARMACEUTICAL-BASED AGENTS

16 hours • Mobile-Ready

Objective: Students become familiar with the hazards and threats associated with synthetic opioids.

This course is designed to improve the safety and effectiveness of anyone who responds to an incident at a PBA laboratory. Participants will be provided with risk-based response guidelines on selecting personal protective equipment and decontamination equipment, and they will be able to recognize incident indicators.

Students will receive hands-on instruction on different fentanyl synthesis pathways, production and current trends and sophistication of synthetic opioid clandestine lab operations. All participants will have the opportunity to test current detection and identification methods utilizing their equipment. The course concludes with a practical decontamination demonstration where students will examine the effectiveness of various decontamination methods using a visual stimulant.

CHEMICAL WARFARE

Length tailored to customer requirements • Mobile-Ready

Objective: Introduce chemical weapons and warfare agents.

The topic is treated from a historical, developmental, and likely-use perspective. The toxic properties, exposure symptoms, countermeasures, and basic synthetic methods for the major classes of chemical agents is reviewed.

This course also delves into the development of these weapons and both past and possible use scenarios. The course is readily customized for the first responder, support team member, or the warfighter. It provides a “what to look for” in common chemical weapons synthetic efforts. It serves as the basis for the Improvised and Clandestine Laboratory Course as well as other sampling and analysis courses offered by NSRI. The course can be offered at the Secret or Unclassified level.

Chemical Signature and Recognition course participant tests his portable chemical lab under a chemical hood.
DECONTAMINATION CONSIDERATIONS AND APPLICATIONS

40 hours • Mobile-Ready

Objective: Improve students’ current CBRN decontamination operational plans and procedures.

The course is instructed by subject matter experts who bring the most recent data and scientific knowledge to the class. Advanced decontamination technologies and skills are presented to the students and reinforced through scenario-driven practical exercises.

Training instruction includes emerging and advanced threats, decontamination principles, decontamination science and FBI decontamination case studies as well as chemical, biological, radiological decontamination techniques and best practices. Students use their own issued equipment and respond to various problem sets they will have to work through — from large scale decon operation to small tactical applications. Hot washes and after-action reviews are conducted after each evolution to improve performance as the course progresses. The course concludes with a full-scale capstone exercise focused on a specific decontamination scenario.

Topics covered in the course include:

- Emerging threats
- Personal protective equipment
- Science of DECON
- Dermal toxicity
- Biological, radiological and chemical decon
- Pharmaceutical agents decontamination
- Tactical application of decontamination operations
- Current practices of decontamination for other agencies
- Case studies

CHEMICAL SIGNATURE AND RECOGNITION

32 hours • Mobile-Ready

Objective: Increase the safety and awareness of the WMD-CST upon entering a clandestine or makeshift laboratory.

A hardware store inspired laboratory is limited only by the creativity of the designer. As such, no two makeshift laboratories will look identical. It is critical for the Weapons of Mass Destruction – Civil Support Teams (WMD-CST) to understand the fundamentals of chemistry laboratory techniques to analyze the setup, assess the safety and determine the chemical processes occurring upon entering a makeshift laboratory.

This course combines practical hands-on learning training stations with classroom instruction. Participants will become familiar with basic chemistry laboratory techniques, equipment, material capabilities and commercial chemical availability. This course is designed to increase the safety and awareness of the CWMD units upon entering a clandestine or makeshift laboratory.

Participants will receive classroom and hands-on instruction of eight basic chemistry lab techniques using standard chemistry glassware setups to generate, separate, isolate, and purify mixtures of chemicals. Participants will leverage this knowledge to design and construct equipment setups from hardware store components that mimic the capabilities of standard glassware setups. The participants will then test and evaluate these hardware store setups in the generation, separation, isolation and purification of benign chemicals. Finally, a laboratory practical will test the students and their hardware store setups using commercially available chemicals to generate chemical war agent simulants and precursor chemicals.
**BIOLOGICAL COURSES**

**BIOLOGICAL PRODUCTION SIGNATURES**

16 hours • Mobile-Ready

**Objective:** Familiarize students with biological weapons characteristics, design, and production processes to provide an awareness of various growth methods and hazards associated with the agents.

This course combines lecture and demonstration starting with a general overview and history of biological weapons and their use. Students will be informed of the rationale and design of biological agents for use as weapons. Basic principles of growth and associated equipment is presented for various types of biological materials (bacteria, virus, and toxins). The course also includes hands-on demonstrations of biological processes, emphasizing potential hazards and sampling opportunities.

**SMALL SCALE BIOLOGICAL PRODUCTION**

32 hours • Mobile-Ready

**Objective:** Students understand the production of biological agents by demonstration and growth of biological material.

The course combines lecture with hands-on design and build of biological processes. It focuses on non-state sponsored productions processes and use of easily acquired material for production of biological agents. The initial instruction will provide a general overview of agents, growth characteristics, and requirements for production. Students will then be given the opportunity to design and build production processes using commercially available material. The course concludes with analysis of the processes and quality of the product generated.

**BIOSURVEILLANCE MANAGEMENT**

24 hours • Mobile-Ready

**Objective:** Enhance decision-making using laboratory results and the information/resource available to assist with those decisions and their consequences.

This course is designed for those who manage biosurveillance or biological warfare identification/detection laboratories. Participants will have some in-lab time to gain a familiarity with BW/Biosurveillance detection identification instruments and produce data from analysis and discussion. Expect talks from members of the biosurveillance community including Public Health, Deployed Field Diagnostics Mission Partners, CWMD Agencies, and National Laboratories/Institutes.

**MINION BIOSURVEILLANCE**

24 hours • Mobile-Ready

**Objective:** Enhance field application, procedural use, and data interpretation of the MinION WGS.

This course will focus on field application, procedural use, and data interpretation of the MinION WGS. Though primarily a laboratory course, exploring the utility and validity of data analysis will form the basis of discussions with the intent of identifying follow-on recommendations. Students will use individual lab space and gloveboxes to prepare samples and use MinION to identify/classify potential biothreats.

**BIOFIRE FILMARRAY OPERATIONS**

16 hours • Mobile-Ready

**Objective:** Train troubleshooting, sample preparation, data analysis, and results integration.

In this laboratory-intensive course, students will be responsible for their own lab space and glovebox to work through numerous problem sample scenarios.
**APPLIED BIOSURVEILLANCE EXPEDITION**

64 hours

**Objective:** Enhance biosurveillance sampling techniques and development of biosurveillance sampling plans.

This course is designed as an advanced biosurveillance sampling and analysis course. Students will arrive at either the Field Station or the NSRI NCR Laboratory and Conference Center in Annapolis Junction, Md., to be trained in biosurveillance sampling techniques and, in teams, develop biosurveillance sampling plans that target specific regions of interest in the US with assistance of the XBRT staff.

Teams will then pack out supplies and equipment for the biosurveillance mission prior to travel to the field site. On site, students will conduct their sampling operations and prepare their samples for shipment IAW their sampling plan and instructions and guidance from staff.

Students will travel back to NSRI NCR Facility for additional instruction in sample processing and conduct analysis of the samples IAW their sample processing plans. Each team will be provided their own laboratory space, glovebox, and laboratory instruments and reagents to perform their analysis of the samples they collected. Students will receive guidance on instrument operations, sample processing, and data management to produce a biosurveillance assessment report for the area of sample operations.

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**BIOLOGICAL AGENT PRODUCTION**

32 hours • Mobile-Ready

**Objective:** Introduce foundational concepts of biological agent production and expand on these by requiring students to design, build, and produce biological simulants using off-the-shelf hardware.

The course focuses on growth, concentration, drying, and milling of a spore-forming bacteria (Bacillus thuringiensis). The curriculum leverages academic instruction to convey the process requirements and general considerations when designing and building biological production operations.

Students will be required to have a fundamental knowledge of biology. Coursework will consist of PowerPoint lecture with interactive hands-on work on biological production processes. Students will gain vital knowledge about biological weapon production, how they are designed, how they are produced, and critical sampling points. The course will focus on these areas as it relates to the organization’s mission and function.

Participant uses improvised biological hood to manipulate biological material that he grew in the Biological Production course.
**EXPLOSIVE COURSES**

**HOMEMADE EXPLOSIVES AWARENESS**

8 hours

*Objective:* Fill the gap in knowledge that exists between trained EOD Operators/Bomb Technicians and first responders.

An awareness of homemade explosives (HME) IED’s is critical for first responders, as they are often the first ones to encounter the threat of such substances and devices. The course is designed to promote awareness in order to enable early recognition and an appropriate response by the discoverer of HME mixtures, precursor chemicals, IED’s or IED components. As a part of the course, participants will handle inert HME mixture samples.

Additionally, mock IED’s with a variety of switches will be demonstrated in order to enhance the hands-on learning of participants. Finally, participants will be introduced to a mock HME lab to give them an idea of what equipment might be found on site.

**ADVANCED HOMEMADE EXPLOSIVES PRODUCTION**

40 hours

*Objective:* Improve the safety and effectiveness of CST members, EOD Technicians, Special Operators and Intelligence Analysts by giving them a greater awareness of improvised explosive (HME) manufacture.

This course is an advanced, fast-paced, hands-on class. It combines eight hours of classroom instruction with 32 hours of hands-on learning. The course is designed to enhance recognition of HME operations and precursors. It also increases understanding of the hazards of precursor chemicals and improvised explosives, field identification methods and comparison of HME sensitivity and performance relative to standard military and commercial explosives.
INTERMEDIATE HOMEMADE EXPLOSIVES PRODUCTION

24 hours

Objective: Improve the safety and effectiveness of CWMD agencies, EOD technicians, DOD members, law enforcement personnel and intelligence analysts by giving them a greater awareness of improvised explosive (HME) manufacture.

This is a three-day Intermediate Improvised Explosives course. The course combines eight hours of classroom instruction with 16 hours of hands-on learning.

The course objectives include recognition of HME operations, understanding the hazards of precursor chemicals and improvised explosives, crude field identification methods, desensitization techniques, and comparison of HME sensitivity and performance to standard explosives.

IMPROVISED EXPLOSIVE DEVICE AWARENESS

8 hours

Objective: Provide the knowledge and skills for first responders to not only identify potential explosive threats but identify the key components critical for determining response procedures.

This course provides a comprehensive overview of improvised explosive devices (IEDs) for CWMD agencies, law enforcement and fire to assist in the execution of their duties. It covers a brief history of the use of IEDs, and their evolution as a terrorist attack weapon. Participants will be provided with explosives familiarization, to include recognition of commercial, military, and homemade explosives, as well as their function and uses.

Attendees will participate in classroom lecture and practical labs to understand how IEDs function. Students will be exposed to practical exercises, focusing on the identification of an array of IEDs, their components and triggering mechanisms. The course will guide emergency personnel through the attack cycle in relation to the IED manufacturing process while identifying points of observable activity that can be communicated to emergency responders.

Participant displays improvised blasting cap.
LABORATORY / ANALYTICAL COURSES

ADVANCED BIOSURVEILLANCE LEADERSHIP

2 weeks • Mobile-Ready

Objective: The XBRT-ABLC is an intensive analytical operations-focused course designed to ensure the next generation of analytical leaders stay relevant and continue to provide the best assistance and advice.

The course will challenge students to demonstrate expertise in biosurveillance techniques, concepts, and adaptive thinking while working to solve current and/or historical analytical operations problems faced by the CST community.

In order to remain relevant, students will:

• Learn from the stories, programs, and projects that comprise the biosurveillance community including engagement with Public Health, Deployed Field Diagnostics Mission Partners, CWMD Agencies, and National Laboratories/Institutes.
• Demonstrate understanding of CLIP/CLIA and ISO programs, ensuring a literacy in the concept of quality and legal requirements of clinical and environmental biosurveillance.
• Develop or select models, theories, and hypothesis to test current biosurveillance operations, protocols, or procedures with the goal of creating refined, specific, and relevant solutions or documenting findings.
• Perform experiments to test hypotheses or models based on current biosurveillance TTPs.
• Be expected to learn and adapt new technologies and instruments into operational models of biosurveillance in order to guide validation and implementation of these maturing technologies.
• Be expected to present their projects and demonstrate utility and relevance for University of Nebraska graduate credit.

ANALYTICAL EXERCISE

36-72 hours • Mobile-Ready

Objective: The XBRT Analytical Exercise is a dynamic exercise to stress and hone the operational capability of fully trained analytical laboratory operators through 36 to 72 hours of continuous analytical operation.

In a multi-laboratory team environment, the exercise will challenge the operational awareness and objective-oriented focus of laboratory operators while they process challenging samples and integrate intelligence and information from multiple incidents. The dynamic time-sensitive scenario will require operators to leverage training, experience, and knowledge to provide the most accurate and relevant information in-time to make a difference.

Participants will:

• Triage samples by sample type, origin, and probability of most hazardous
• Prioritize how samples will be processed as a single lab or as multiple labs
• Apply scientific expertise and references to complete RFIs
• Identify or characterize radiation and FTIR spectra received electronically
• Identify or characterize the hazard from chemical and biological samples
• Track sample progress among shifts, participants, and participating laboratories
• Exercise or establish protocols and procedures with local Public Health and agency laboratories
• Provide the most accurate answers and recommendations in a timely manner
MEDICAL COURSES

ADVANCED MEDICAL TREATMENT FOR HAZMAT

32 hours ♦ Mobile-Ready

Objective: Teaches healthcare and EMR professionals to medically manage patients exposed to HAZMAT.

The course is comprised of four separate modules combined into a single 32-hour course. This course is eligible for continuing education credit by the College of Medicine, American Academy of Clinical Toxicology, CAPCE, and Center for Disease Control and Prevention.

Module 1
Advanced Hazmat Life Support Provider (16hrs)

Objective: Learn how to medically manage patients exposed to hazardous materials by recognizing the signs and symptoms.

This course covers hazardous materials including insecticides, corrosives, irritant gases, asphyxiants, hydrocarbons and substituted hydrocarbons and chemical, biological, radiological and nuclear agents. Specific antidotes and their indications, contraindications, dosing and route are also included.

After the course, participants will be able to rapidly assess hazmat patients, recognize toxic syndromes (toxidromes), discuss the medical management of hazmat patients, apply the Poisoning Treatment Paradigm™ and identify and recognize appropriate administration of specific antidotes.

Module 2
AHLS for Radiological Incidents & Terrorism (4hrs)

Objective: Prepare to evaluate and manage patients who are externally and internally contaminated with radioactive materials or who are exposed to ionizing radiation without contamination.

Advanced Hazmat Life Support (AHLS) for Radiological Incidents and Terrorism is a 4-hour course with interactive lectures and tabletop exercises that trains EMR professionals to evaluate and care for irradiated and radiologically contaminated patients.

Participants will identify the four subsyndromes of acute radiation syndrome. They will use colony stimulating factors, such as filgrastim, pegfilgrastim, and sargramostim to treat patients with acute radiation syndrome, as well as use calcium DTPA and zinc DTPA as antidotes or countermeasures for internal contamination with plutonium, americium or curium. They will use prussian blue as the antidote for internal contamination with cesium or thallium and use potassium iodide as the antidote for internal contamination with radioactive iodine.

Module 3
AHLS for Chemical Burns & Toxic Products of Combustion (4hrs)

Objective: Teaches EMR professionals to medically manage chemical burns and toxic inhalation injuries, including carbon monoxide and cyanide poisoning.

Course consists of didactic lecture and tabletop exercises. After the course, participants will be able to: recognize that inhalation is the most common route of exposure at hazmat incidents; list the routes of exposure for acids, bases, oxidizers and white phosphorus; describe characteristic signs and symptoms of poisoning by hydrofluoric acid; and recite the Poisoning Treatment Paradigm™ for asphyxiant poisonings.

Module 4
Explosion and Blast Injuries (8hrs)

Objective: Introduce information relevant to the initial assessment and care of casualties from explosives and blast injuries.

Explosions can produce unique patterns of injury seldom seen outside combat. When they do occur, they have the potential to inflict multi-system, life-threatening injuries on many persons simultaneously. Because explosions are relatively infrequent, blast-related injuries can present unique triage, diagnostic and management challenges to providers of emergency care.

Through this course participants will practice assessment of HAZMAT patients and implementation of appropriate care options. After the course, participants will be able to execute the full scope of essential care duties including but not limited to: recognize toxic syndromes, apply the poisoning treatment paradigm and recognize treatment method for most common postexplosion injuries.
BIOLOGICAL SPECIALIST

**Objective:** Triage, treatment and evacuation of casualties from a biological warfare event.

The course is designed to exercise the requirements, development and synchronization of SOPs for USG agencies identifying, treating and transporting casualties from a biological incident anywhere in the world.

The course involves: instruction on threats, capability demonstrations of relevant support organizations, international capabilities by host nations, hands-on interaction with mobility platforms, and discussion of treatment regimens.

The course culminates with a multi-hour exercise where SOP’s will be challenged and refined for future use. Coursework will consist of a PowerPoint lecture with interactive, hands-on work on patient care and transport processes. Students will gain vital knowledge about biological agent treatment, isolation and transport. The course will focus on these areas as it relates to the organization’s mission and function.

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EMERGENCY MEDICAL TRANSPORT OF HIGHLY INFECTIOUS DISEASE PATIENTS

**Objective:** Prepare first responders to plan, prepare and safely transport patients with a highly infectious or high consequence disease.

The course includes the planning and preparation components to ensure personnel with these specialized skills are prepared to integrate into local, regional, or national emergency structures.

The course trains emergency medical personnel how to prepare an ambulance and crew for transport and rapid decontamination. Participants will also be trained in when, where, and how to don and doff Powered Air-Purifying Respirators (PAPR), full-disposable coveralls, and other associated PPE.

Finally the course provides hands-on practical experience with: planning a transport, preparing the ambulance, donning and doffing PPE, and the operation and movement of a portable isolation unit.

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BASIC CBRN MEDICAL RESPONSE FOR FRONTLINE WORKERS

**Objective:** Teach first responders the basic knowledge, skills and abilities needed to manage a potential CBRN patient.

The course includes classes on emerging threats, risk identification and mitigation, patient isolation, personal protective equipment, decontamination, packaging and transport of CBRN patients.

Additionally, students will learn how to manage patients in austere environments using nonconventional methods. The course includes academic blocks of instruction, hands-on activities and culminating scenarios where students apply what they have learned.

The course is intended for participants with little to no experience managing CBRN patients.
OPERATIONAL COURSES

TACTICAL RESPONSE TO WMD FOR LAW ENFORCEMENT

40 hours ♦ Mobile-Ready

**Objective:** Provide law enforcement or tactical response team with training on equipment and tactics needed to safely respond to and operate in an environment involving the terrorist use of weapons of mass destruction — chemical, biological, radiological or nuclear.

The course covers a general awareness of chemical, biological, and radiological and explosive hazards, as viewed by the tactical team. Additional focus is placed on the crisis resolution for improvised and clandestine laboratories and force protection options, while operating in a CBRNe environment.

One of the main objectives of this course is to utilize or develop each team’s standard operating procedures (SOPs). Additional topics covered will be self, hasty, and emergency decontamination, first aid in a hazardous environment, tactical considerations, and officer safety issues in dealing with a small- or large-scale WMD event.

This is an intense course of practical application and scenario-based training. At the conclusion of the course students will be able to recognize WMD threats, choose the protective equipment for their mission profile, and safely execute their mission objectives in a hazardous environment. They will also be able to provide emergency decontamination, mitigation and stabilization of the incident. The culminating event for this course is a full-scale exercise designed to reinforce lessons learned throughout the week. Strong emphasis on interactive and practical exercises. Simulations are an important part of the course. We ensure a challenging but safe learning environment.

PR2 OPERATIONS

32 hours

**Objective:** Demonstrate the technology relevant in understanding the data and troubleshooting through practical analysis.

Through this laboratory-intensive course, students will utilize their own lab space, organizational protocols, and gloveboxes to work through numerous problem sets similar to those expected in real-world scenarios.

JBAIDS PCR OPERATIONS AND TRAINING

24 hours

**Objective:** Help operators remain knowledgeable and capable in designing and analyzing PCR.

This course will focus on the technology of PCR and implementation of the principles beyond the JBAIDS platform. Despite the platform’s near departure, the concepts and analysis of real-time PCR will continue to be relevant. PCR will continue to be relevant and this legacy course will ensure operators remain knowledgeable and capable in designing and analyzing PCR. Students will utilize their own lab space, organizational protocols, and gloveboxes to work through numerous problem samples including sample preparation, DNA extraction, and data analysis.
BIOLOGICAL THREAT RESPONSE AND SAMPLING

Objective: Address crucial and specific skills and techniques associated with responding to a suspected biological threat and sample collection.

Students will become familiar with The National Strategy for CBRN Standards, the Framework for a Biothreat Field Response Mission Capability and FBIDHS-HHS/CDC coordinated document guidance on initial responses to a suspicious letter/container with a potential biological threat. Students will perform field screening, site characterization and become proficient in public safety sampling techniques required in the response to a suspected biological threat.

This course consists of lecture and skill-building by utilizing hands-on collection problems. It focuses on the role of the first responder and the process of collecting forensically valid samples through laboratory analysis; utilizing the ASTM E-2770-10 Standard Guide for Operational Guidelines for Initial Response to a Suspected Biothreat Agent and, ASTM E-2458 Bulk Sample Collection and Swab Sample Collection of Visible Powders Suspected of Being Biothreat Agents from Nonporous Surfaces Overview. This process is consistent with the FBI 12-step process for managing a crime scene, including those involving a WMD.

Additionally, students will be introduced to the CDC surface sampling procedures for Bacillus anthracis spores. Students will become familiar with the hazard and threat assessment process as well as the FBI Threat Credibility and Evaluation (TCE) call that takes place on scene and the role of the FBI's Weapons of Mass Destruction Coordinator (WMDC) during the incident. At the end of the course students will be evaluated with a written test and hands-on demonstration of sample collection techniques.

USMS loading CH-47 Chinook for Tactical Response to WMD class exercise.