



Northeastern Illinois Public Safety Training Academy

Course Syllabus

205

Title: Vehicle & Machinery Operations	Program Duration: 40 hours
Type: Campus Training Program (CTP)	Coordinator: C. Soda

Course Description

NIPSTA's Vehicle and Machinery Operations program is designed to exceed the requirements outlined by the Illinois Office of the State Fire Marshal "OSFM", and provides students with the basic knowledge and skills needed to perform vehicle and machinery rescue at the NFPA 1670 & 1006 Operations level. Students will leave prepared to operate as a member of a regional team capable of responding to statewide emergencies involving CBRNE or WMD, where basic vehicle and machinery rescue may be needed.

Prerequisites

The purpose of prerequisite course work is to ensure students have sufficient backgrounds to understand the terminology, tactics and practical applications presented in NIPSTA programs. At a minimum, NIPSTA requires successful completion of the following:

- Member of recognized fire department/brigade
- Basic Operations Firefighter

Attendance

In order to receive a certificate of completion for courses, NIPSTA requires students to be present for all lectures, demonstrations and evolutions.

Safety

NIPSTA Instructors will ensure hazards have been identified and addressed prior to the start of each program. All course safety guidelines are discussed prior to operations. Unsafe actions or behaviors will not be tolerated and will be grounds for dismissal.

Academic Integrity

NIPSTA aspires to the highest possible standards of academic honesty and integrity in all programs as key tenants of the NIPSTA experience. NIPSTA Instructors set forth clear ethical expectations, promote consistency of standards, and encourage reporting of dishonest and unsafe behaviors. While education through participation is the central goal for every NIPSTA program, it is only possible when honesty and integrity are part of the overall mission.

Performance Testing & Evaluation

NIPSTA employs multiple methods of measuring competency subject matter including cognitive and performance skill testing. Cognitive skills will be measured by utilizing a comprehensive written exam at the conclusion of the course. Students must achieve a minimum 70% score to successfully pass the written exam. Performance skill tests measure an individual's ability to perform specific tasks or applications based on given or known JPRs. Unless otherwise specified, performance skill tests will be measured on a pass or fail basis.

ADA Compliance

Students with a documented disabilities, as that term is used in the American with Disabilities Act (ADA), may qualify for reasonable accomodations as defined in section 504 of the Rehabilitation Act of 1973.

Textbook

The following textbook is required for NIPSTA's Vehicle & Machinery Operations course.

- **Title:** "Vehicle Rescue and Extrication: Principles and Practice, Second Edition"
- ISBN: 9781284042177

Pre-course Assignments

The purpose of pre-course assignments is to ensure candidates are prepared to succeed at the onset of the program. The pre-course assignments for NIPSTA's Vehicle and Machinery Operations course are as follows:

- **Read:** Vehicle Rescue and Extrication: Principles and Practice: Chapters 1 – 11

Course Content

Course content is broken into subject area modules or "Mods". NIPSTA's Vehicle and Machinery Operations program is comprised of the followng 36 Mods:

Mod 1: Introduction & Orientation	Mod 19: Pneumatic Tools for Extrication
Mod 2: Safety & Risk Management	Mod 20: Electric Tools for Extrication
Mod 3: Vehicle Incident Hazards	Mod 21: Chain & Cable Devices
Mod 4: Scene Safety & Control	Mod 22: Butress Systems
Mod 5: Traffic Control	Mod 23: Unstable Vehicles
Mod 6: Vehicle Incident ICS	Mod 24: Cribbing & Chocks
Mod 7: Vehicle Incident Size-up	Mod 25: MVIs Below Grade
Mod 8: Vehicle Construction	Mod 26: MVI Access Via Rope
Mod 9: Supplemental Restraint	Mod 27: Machinery Incident Hazards
Mod 10: Fuel Systems	Mod 28: Machinery Incident Size-up
Mod 11: De-energizing Vehicles	Mod 29: Isolating Machinery Hazards
Mod 12: Basic Stabilization	Mod 30: Vehicle Extrication Techniques
Mod 13: Primary Access Points	Mod 31: Machine Extrication Techniques
Mod 14: Victim Location & Access	Mod 32: Basic Vehicle Lifting (air bags)
Mod 15: Mechanism of Injury/Treatment	Mod 33: WMD/CBRNE Factors
Mod 16: Victim Protection & Packaging	Mod 34: Terminating the Incident
Mod 17: Hand Tools for Extrication	Mod 35: Knowledge Assessment Testing
Mod 18: Hydraulic Tools for Extrication	Mod 36: Skill Assessment Testing

Learning Outcomes & Evaluation

Following the conclusion of these modules, students will be familiar with the requisite knowledge and skills needed to perform as a member of a vehicle and machinery rescue team. Written and practical evaluations will be conducted at the completion of this course.

Course Schedule

Day 1

Lecture (8 hours)

- Mod 1:** Introduction & Orientation
- Mod 2:** Safety & Risk Management
- Mod 3:** Vehicle Incident Hazards
- Mod 4:** Scene Safety & Control
- Mod 5:** Traffic Control
- Mod 6:** Vehicle Incident ICS
- Mod 7:** Vehicle Incident Size-up
- Mod 8:** Vehicle Construction
- Mod 9:** Supplemental Restraint
- Mod 10:** Fuel Systems
- Mod 11:** De-energizing Vehicles
- Mod 12:** Basic Stabilization
- Mod 13:** Primary Access Points
- Mod 14:** Victim Location & Access
- Mod 15:** Mechanism of Injury/Treatment
- Mod 16:** Victim Protection & Packaging
- Mod 17:** Hand Tools for Extrication
- Mod 18:** Hydraulic Tools for Extrication
- Mod 19:** Pneumatic Tools for Extrication
- Mod 20:** Electric Tools for Extrication
- Mod 21:** Chain & Cable Devices
- Mod 22:** Buttress Systems
- Mod 30:** Vehicle Extrication Techniques
- Mod 33:** WMD/CBRNE Factors
- Mod 34:** Terminating the Incident

Day 2

Lecture (2 hours)

- Mod 25:** MVIs Below Grade
- Mod 24:** Cribbing & Chocks
- Mod 26:** MVI Access Via Rope
- Mod 30:** Vehicle Extrication Techniques
- Mod 27:** Machinery Incident Hazards
- Mod 28:** Machinery incident Size-up
- Mod 29:** Isolating Machinery Hazards
- Mod 31:** Machinery Extrication Techniques (fingers, hands, limbs)

Practical Exercises (6 hours)

Tool & Equipment Review

- Mod 17:** Hand Tools for Extrication
- Mod 18:** Hydraulic Tools for Extrication
- Mod 19:** Pneumatic Tools for Extrication
- Mod 20:** Electric Tools for Extrication

- Mod 22:** Buttress Systems
- Mod 12:** Basic Stabilization (cribbing)
- Mod 22:** Buttress Systems
- Mod 32:** Basic Vehicle Lifting (air bags)
- Mod 18:** Hydraulic Tools for Extrication
- Mod 13:** Primary Access Points
 - Glass, Doors, Roof

Day 3

Practical Exercises (8 hours)

- Mod 10:** Fuel Systems (electric vehicle demo)
- Mod 17:** Hand Tools for Extrication
- Mod 21:** Chain & Cable Devices
- Mod 19:** Pneumatic Tools for Extrication
- Mod 23:** Unstable Vehicles (overturned vehicle access)
- Mod 30:** Vehicle Extrication Techniques
 - “Dash Lift & Roll” Techniques

Day 4

Practical Exercises (8 hours)

- Mod 14:** Victim Location & Access
- Mod 16:** Victim Protection & Packaging
- Mod 12:** Basic Stabilization (cribbing)
- Mod 22:** Buttress Systems
- Mod 32:** Basic Vehicle Lifting (air bags)
- Mod 30:** Vehicle Extrication Techniques
 - 5th Door & Clam-shell Techniques

Day 5

Reading List

Case Study:

Lecture (2 hours)

- Mod 35:** Knowledge Assessment Testing (final exam)

Practical Exercises (6 hours)

- Mod 35:** Skill Assessment Testing (final scenario)
- Scenario Critique & Equipment Rehab
- Course Evaluation Questionnaire (CEQ)

Reference List

Sweet, D. (2020). *Vehicle rescue and extrication: Principles and practice*. Burlington, MA: Jones & Bartlett Learning.

NFPA 1006, *Standard for Rescue Technician Professional Qualifications*, 2017 Edition

NFPA 1670, *Standard on Operations and Training for Technical Rescue*, 2017 Edition