



Northeastern Illinois Public Safety Training Academy

Course Syllabus

207

Title: Vehicle & Machinery Technician

Program Duration: 40 hours

Type: Campus Training Program (CTP)

Coordinator: K. Burns

Course Description

NIPSTA's Vehicle and Machinery Technician 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 advanced 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
- Rope Rescue Operations
- Hazardous Materials Operations
- Vehicle & Machinery Operations

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 accommodations as defined in section 504 of the Rehabilitation Act of 1973.

Textbook

The following textbook is required for NIPSTA's Vehicle and Machinery Technician course.

- Title: "Vehicle Extrication Levels I & 2, Principles and Practice"
 - ISBN: 9781449648824

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 course are as follows:

- **Review:** Vehicle Extrication Levels I & II: Principles and Practice - Chapters 1 – 9
- **Read:** Vehicle Extrication Levels I & II: Principles and Practice - Chapters 10 – 13

Course Content

Course content is broken into subject area modules or "Mods". NIPSTA's Vehicle & Machinery Technician program is comprised of the following 44 Mods:

Mod 1: Introduction & Orientation
Mod 2: Safety & Risk Management
Mod 3: Large Vehicle Incident Hazards
Mod 4: Scene Safety & Control
Mod 5: Traffic Control Review
Mod 6: Vehicle Incident ICS Review
Mod 7: Large Vehicle Incident Size-up
Mod 8: Large Vehicle Construction
Mod 9: Vehicle Supplemental Restraint
Mod 10: Large Vehicle Fuel Systems
Mod 11: De-energizing Large Vehicles
Mod 12: Large Vehicle Stabilization
Mod 13: Large Vehicle Primary Access
Mod 14: Victim Location & Access
Mod 15: Specialized Search Equipment
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: Gas Tools for Extrication
Mod 22: Chain & Cable Devices

Mod 23: Buttruss Systems
Mod 24: Unstable Large Vehicles
Mod 25: Specialized Heavy Equipment
Mod 26: Lg. Machinery Incident Hazards
Mod 27: Lg. Machinery Incident Size-up
Mod 28: Isolating Lg. Machinery Hazards
Mod 29: De-energizing Large Machinery
Mod 30: Large Vehicle Ext. Techniques
Mod 31: Lg. Machine Ext. Techniques
Mod 32: Large Vehicle Lifting (air bags)
Mod 33: Multiple Vehicle Incidents
Mod 34: Lg. Machinery Lifting (air bags)
Mod 35: Elevator Incident Size-up
Mod 36: Elevator Construction & Features
Mod 37: De-energizing Elevators
Mod 38: Elevator Victim Removal
Mod 39: Medivac LZ Operations
Mod 40: WMD/CBRNE Factors
Mod 41: VMT Incident ICS
Mod 42: Equipment Care & Maintenance
Mod 43: Knowledge Assessment Testing
Mod 44: 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

Reading List

Vehicle Extrication Levels I & II: Principles and Practice - Chapters 10 through 13

Lecture (4 hours)

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| Mod 1: Introduction & Orientation | Mod 13: Large Vehicle Primary Access |
| Mod 2: Safety & Risk Management | Mod 14: Victim Location & Access |
| Mod 3: Large Vehicle Incident Hazards | Mod 15: Specialized Search Equipment |
| Mod 4: Scene Safety & Control | Mod 16: Victim Protection & Packaging |
| Mod 5: Traffic Control Review | Mod 17: Hand Tools for Extrication |
| Mod 6: Vehicle Incident ICS Review | Mod 18: Hydraulic Tools for Extrication |
| Mod 7: Large Vehicle Incident Size-up | Mod 19: Pneumatic Tools for Extrication |
| Mod 8: Large Vehicle Construction | Mod 20: Electric Tools for Extrication |
| Mod 9: Vehicle Supplemental Restraint | Mod 21: Chain & Cable Devices |
| Mod 10: Large Vehicle Fuel Systems | Mod 22: Buttress Systems |
| Mod 11: De-energizing Large Vehicles | Mod 30: Large Vehicle Ext. Techniques |
| Mod 12: Large Vehicle Stabilization | Mod 33: Multiple Vehicle Incidents |

Practical Exercises (4 hours)

Tool Lab

- Mod 17 – 20:** Tool Review
- Mod 21:** Gas Tools for Extrication
- Mod 22 – 23:** Tool Review

Multiple Vehicle Incidents

- Mod 33:** Multiple Vehicle Incidents

Day 2

Reading List

Vehicle Extrication Levels I & II: Principles and Practice: Chapters 8, 9 and 13

Lecture (2 hours)

- Mod 24:** Unstable Large Vehicles
- Mod 25:** Specialized Heavy Equipment
- Mod 26:** Lg. Machinery Incident Hazards
- Mod 27:** Lg. Machinery Incident Size-up
- Mod 28:** Isolating Lg. Machinery Hazards
- Mod 29:** De-energizing Large Machinery
- Mod 32:** Large Vehicle Lifting (air bags)
- Mod 33:** Multiple Vehicle Incidents
- Mod 35:** Elevator Incident Size-up
- Mod 36:** Elevator Construction & Features
- Mod 37:** De-energizing Elevators
- Mod 38:** Elevator Victim Removal

Practical Exercises (6 hours)

Elevator Rescue Operations

Mod 36: Elevator Construction & Features

Mod 37: De-energizing Elevators

Mod 38: Elevator Victim Removal

Large Passenger Vehicle Operations

Mod 7: Large Vehicle Incident Size-up

Mod 12: Large Vehicle Stabilization

Mod 13: Large Vehicle Primary Access

Mod 30: Large Vehicle Ext. Techniques

Large Vehicle & Machinery Lifting

Mod 32: Large Vehicle Lifting (air bags)

Mod 34: Lg. Machinery Lifting (air bags)

Day 3

Reading List

Case Study:

Lecture (2 hours)

Mod 31: Lg. Machine Ext. Techniques

Mod 34: Lg. Machinery Lifting (air bags)

Practical Exercises (6 hours)

Large Vehicle & Machinery Lifting

Mod 32: Large Vehicle Lifting (air bags)

Mod 34: Lg. Machinery Lifting (air bags)

Large Machinery Disentanglement

Mod 29: De-energizing Large Machinery

Mod 31: Lg. Machine Ext. Techniques

Day 4

Reading List

Case Study:

Lecture (2 hours)

Mod 39: Medivac Landing Zone Operations

Mod 40: WMD/CBRNE Factors

Mod 41: VMT Incident ICS

Mod 42: Equipment Care & Maintenance

Practical Exercises (6 hours)

Commercial & Industrial Vehicle Operations

Mod 7: Large Vehicle Incident Size-up

Mod 8: Large Vehicle Construction

Mod 12: Large Vehicle Stabilization

Mod 13: Large Vehicle Primary Access

Mod 30: Large Vehicle Ext. Techniques

Medivac Landing Zone Operations

Mod 49: Medivac Landing Zone Operations

Day 5

Reading List: Case Study

Lecture (2 hours)

Mod 39: Knowledge Assessment Testing (final exam)

Practical Exercises (6 hours)

Mod 40: Skill Assessment Testing (final scenario)

Scenario Critique & Equipment Rehab

Course Evaluation Questionnaire (CEQ)

Reference List

Sweet, D. (2012). *Vehicle Extrication Level I & II: Principles and Practice*. Boston: 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