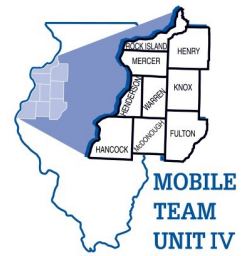# MOBILE TEAM TRAINING UNIT IV

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A Statewide System of Inservice Training Program
Illinois Law Enforcement Training and Standards Board

MOBILE TEAM UNIT IV

PRESENTS

TRAFFIC RECONSTRUCTION SERIES

Mobile Team Training Unit IV is offering a series of courses relating to Crash Investigations and Traffic Crash Reconstruction. Officers wishing to become a Certified Reconstruction Specialist must complete the entire series of courses. Students will be required to bring a laptop or other device with a USB port to the class. All Classes will be provided by Northwestern University Center for Public Safety. All courses will be held at the Silvis Police Department 600 Illini Drive, Silvis, IL. Officers are allowed to register for any class if they can document they meet the prerequisite(s) required for that class; contact MTTU IV directly with that documentation.

Crash Investigation 1 level does not have a prerequisite. In this course Students learn to take measurements and photographs of the crash scene and to create sketches and after-crash diagrams.
Crash Investigation 1 also addresses how the collected data are used to reconstruct crashes. Agencies should consider sending multiple officers to this course to develop this on-scene capability for their agency.
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Course	Hours
Crash Investigation 1	80-Hours
Crash Investigation 2	80-Hours
Vehicle Dynamics	40-Hours
Traffic Crash Reconstruction 1	80-Hours
Traffic Crash Reconstruction 2	80-Hours

The description and Mandatory Key Guidelines are provides on the following pages. Officers may want to visit the Northwestern University, Center for Public Safety– Crash Investigation website for additional details on each course.

Course	Date	Registration Ends	Prerequisite
Crash Investigation 1	September 11-22, 2023	August 28, 2023	**None**
Crash Investigation 2	October 9-20, 2023	September 18, 2023	**Crash Investigation 1**
Vehicle Dynamics	November 13-17, 2023	October 30 , 2023	**Crash Investigation 2**
Traffic Crash Reconstruction 1	December 4-15, 2023	November 20, 2023	**Vehicle Dynamics**
Traffic Crash Reconstruction 2	January 15-26, 2024	November 20, 2023	**Traffic Crash Reconstruction 1**

MTTU IV member agencies have priority registration for all class. Illinois officer tuition: 0.00

All Classes are 8:00 AM to 5:00 PM   **Maximum enrollment is 18**

Please review the following pages for course description and Mandatory Key Guidelines for each class in the series

This Training is grant funded through the Illinois Department of transportation

Mobile Team Training Unit IV has received certification for this course with the Illinois Law Enforcement Training and Standards Board

CRASH INVESTIGATION 1 (80-HOURS)

Prerequisite: None

Per Board approval, this Class Meets the following Mandatory Training Key Guidelines.

Civil Rights (3-hr, 1 scenario based)
Constitutional and proper use of LE authority (4-hr, 4 scenario based)
Legal updates (3-hr, 1 scenario based)

Crash Investigation 1, based on J. Stannard Baker's world-renowned text, *Traffic Crash Investigation*, is an in-depth study of the skills needed to systematically investigate a traffic crash.

Techniques for recognizing and properly recording roadway and vehicle crash evidence are thoroughly presented. Students learn to take measurements and photographs of the crash scene and to create sketches and after-crash diagrams. Crash Investigation 1 also addresses how the collected data are used to reconstruct crashes. Finally, the use of electronic devices to collect and record at-scene data is also introduced.

Course Content

- Preparation for traffic crash investigation
- Collecting information from involved persons & witnesses
- Obtaining information from vehicles
- Collecting information from roadways
- Measuring and mapping the crash scene
- Photographing the crash scene and damaged vehicles
- Vehicle Examination
- Intro to Event Data Recorders

CRASH INVESTIGATION 2 (80-HOURS)
Prerequisite: Traffic Crash Investigation 1
Per Board approval, this Class Meets the following Mandatory Training Key Guidelines.

Civil Rights (2– hours)
Constitutional and proper use of law enforcement authority (3.5-hours, 3 scenario based)
Legal Updates (3-hours, 1 scenario based)
Procedural Justice (9.5-hours, 2 scenario based)
Lead Homicide Investigator (80-hours, 18.5 scenario based)

Crash Investigation 2 builds upon topics examined in Crash Investigations 1 and provides students with greater knowledge of the information available at the crash scene and how to properly collect and initiate interpretation of that information. Like Crash Investigation 1, the course is rooted in Baker and Fricke's *Traffic Crash Investigation* and emphasizes vehicle behavior in crashes, vehicle damage, advanced mapping and evidence locations skills, and properly downloading and preserving digital evidence froom collision investigations.

Course Content
- Vehicle damage analysis - describing, reporting and determination of direction of forces
- Vehicle behavior in crashes
- Identifying and interpreting tire marks, road scars, and other results of a crash on the roadway
- Lamp filament analysis

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VEHICLE DYNAMICS

Prerequisite: Crash Investigation 2

Per Board approval, this Class Meets the following Mandatory Training Key Guidelines.

Civil Rights (0.5– hours)
Constitutional and proper use of law enforcement authority (0.5-hours)
Procedural Justice (0.5-hours)
Lead Homicide Investigator (40-hours)

Vehicle Dynamics introduces student to mathematical formulas and basic physics as they relate to traffic collision investigations. The course focuses on mechanics, the study of motion and forces, and the effects of such forces during a crash.

Vehicle Dynamics is an introduction basic mathematical procedures and the basic laws of physics necessary for those who wish to attend Traffic Crash Reconstruction 1 and Traffic Crash Reconstruction 2.

Course Content
- Newton's laws of motion
- Coefficient of friction and drag factor
- Introduction to basic motion equations - velocity, time, acceleration and distance
- Momentum - collinear (in-line)
- Time-distance Analysis
- Physics & Mathematics overviews

TRAFFIC CRASH RECONSTRUCTION 1
Prerequisite: Vehicle Dynamics
Training Key Guidelines TBA

Civil Rights (1-hr)
Constitutional and proper use of LE authority (1-hr)
Legal Updates (1-hr)
Lead Homicide Investigator (80)

This course teaches the foundations of reconstruction to student who are new to the crash reconstruction profession. In addition to the prerequisite courses, participants should possess an understanding of physics and math skill that include high-school level algebra, geometry and trigonometry.

In Traffic Crash Reconstruction 1, student utilize the knowledge learned in Crash Investigation 1 and 2, as well as Vehicle Dynamics, to understand the determination of how a crash occurred. Based on Lynn Fricke's greatly expanded textbook, Traffic Crash Reconstruction, this course faces on analyzing and interpreting information that has been collected at lower levels of investigation in order to describe the crash and the events leading t actual impact in as much detail as possible. Students apply the lesson from daily lecture material to real-world case study situations-an instruction format that provides students with the training necessary to reconstruct traffic crashes.

Course Content
- Engineering mechanics
- Equations of motion calculations
- Vehicle behavior in collisions
- Principal direction of force analysis
- Introduction to human factors
- Time-distance analysis
- Conservation of momentum
- Oblique and collinear analysis
- Post-collision drag factors
- Newton's Laws of Motion
- Identifying and analyzing road marks

TRAFFIC CRASH RECONSTRUCTION 2

Prerequisite: Traffic Crash Reconstruction 1

Training Key Guidelines TBA

Civil Rights (1-hr)
Constitutional and proper use of LE authority (1-hr)
Legal Updates (1-hr)
Lead Homicide Investigator (80)

Traffic Crash Reconstruction 2 is a continuation of the skills learnd in Reconstruction 1 and is based on Lynn Frick's textbook *Traffic Crash Reconstruction.* Traffic Crash Reconstruction 2 provides training through lecture and daily rea-world case studies to tie lecture material to hands-on analysis. Students expand their understanding of crashes, and analyze collisions using conservation of energy. During the second week, instructors cover special velocity calculations for situations involving vehicle fall, flips, and rollovers. Students also learn basic skills for analyzing Event Data Recorder (EDR) information and how to apply such data to traditional reconstructions. Finally, students are introduced to the Monte Carlo Statistical Analysis and learn to solve momentum-based collision sequences using spreadsheet analysis.

Course Content

- Work and energy
- Damage energy
- Energy and momentum
- Force balance
- After-impact drag factors
- Occupant Kinematics
- Light vehicle event data recorder (EDR) usage in crash reconstruction
- Heavy vehicle EDR usage in crash reconstruction
- Special velocity calculations, including sideswipe, fall, vaults and flips
- Monte Carlo Statistical Analysis