FORT LEONARD WOOD, MO
NONCOMMISIONED OFFICERS ACADEMY
SYLLABUS FOR 12T3O
ADVANCED LEADER COURSE

TECHNICAL ENGINEER SUPERVISOR

Purpose:

The 12T3O Technical Engineer Advanced Leader Course provides 12T Noncommissioned Officers with the technical and tactical skills required to successfully serve as Technical Engineer Squad Leaders. The course also enhances the student's ability to lead, train, and direct subordinates in all aspects of technical engineering.

Course Scope:

Students will demonstrate proficiency in how to Conduct a Technical Construction Analysis, Produce a Construction Site Design, Perform Construction Management, Perform Soil Supervisory Duties, Determine Asphalt Design, Prepare Roadway Design, Process Surveying Data and Conduct Geodetic Airfield Heliport Survey.

Course Prerequisites:

Active Army or Reserve Component enlisted personnel selected by DA (Active Army) or recommended by unit Commander (Reserve Component). Qualified in MOS 12T. Meet requirements outlined in AR 350-1 (para 3-8) and DA Pam 611-21. All Soldiers must have successfully completed the Basic Leader Course (BLC) at least six months before attending this course.

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Security Clearance: Unclassified

Course Length–Weeks: 9 **Days:** 1 **Hours:** 347.3

Class Sizes – Optimum: 12 **Min:** 4 **Max:** 12

Administrative Time:

Module: A / 001 13.7
Title: **Administrative**

Academic Time:

Module: B / 001 11.7
Title: **Shared Engineer Task**

Module: C / 001 246.3
Title: **Technical Training**

Module: D / 001 72.0
Title: **Situational Training Exercise (STX)**

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Module: A / 1
Title: Administrative
Purpose: The purpose of this module is to get Soldiers inprocessed, settled in and making sure all required administrative documents are completed and all necessary references, training aids are issued to each student.
Remarks: None

Technique(s) of Delivery:
Small Group Instruction (SGI) (SG)
Hours
13.7
Security Clearance: Unclassified

Module: B / 1
Title: Shared Engineer Tasks
Purpose: The purpose of this module is to train Technical Engineer Squad Leaders on preparing for an Improvised Explosive Device (IED) threat prior to movement as well as conducting an IED threat analysis. It also discusses the troop-leading procedures and the Supervise Infrastructure Reconnaissance (SWEAT).
Remarks: None

Technique(s) of Delivery:
Small Group Instruction (SGI) (SG)
Hours
11.7
Security Clearance: Unclassified
Lesson Title: Prepare for Improvised Explosive Device Threats Prior to Movement
Lesson Title: React to an Improvised Explosive Device (IED) Attack
Lesson Title: Integrate Crew Systems
Lesson Title: Determine Vehicle Recovery Requirements
Lesson Title: Plan Mounted/Dismounted Movement of Personnel and Equipment
Lesson Title: Conduct a Person Searchar

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Module: C01 / 1
Title: Conduct Technical Construction Analysis
Purpose: This module provides instruction on how to establish project information for a proposed construction site as well as how to produce a pre-construction site analysis report for a construction site. It also discusses how to identify and determine uses of rock as well as how to identify surficial features of geology found on a map. The Module concludes with a written examination.
Remarks: None

Technique(s) of Delivery:
Small Group Instruction (SGI) (SG)
Hours
26.6
Security Clearance: Unclassified
Lesson Title: The Army Records Information Management System (ARIMS)
References: AR 25-400-2 The Army Records Information Management System (all)
Lesson Title: Establish Project Information
References: FM 5-412 Project Management (Chapter 1)
Lesson Title: The A / E / C CADD Standards
References: ERDC/ITL TR-09-2 A / E / C CAD Standards (all)
Lesson Title: Identify and Determine Uses of Rock
References: FM 5-410 Military Soils Engineering (Chapters 1 & 5)
Lesson Title: Identify Surficial Features of Geology
References: FM 5-410 Military Soils Engineering (Chapter 3)

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Module: C02 / 1
Title: Produce a Construction Site Design
Purpose: This module provides instruction on how to produce a construction site design utilizing Terramodel software. It also discusses how to ensure all features, dimensions, and that notes are accurate according to the design sketch, the specifications, and A/E/C CADD Standards. The Module concludes with a hands on evaluation test.
Remarks: None
Technique(s) of Delivery:
Small Group Instruction (SGI) (SG)
Hours
25.4
Security Clearance: Unclassified
Lesson Title: Terramodel
References: Terramodel Manuals
Lesson Title: JCMS
References: JCMS Manuals

Module: C03 / 1
Title: Perform Technical Construction Management
Purpose: This module provides instruction on technical equipment maintenance as well as producing a bill of materials (BOM) list. It also discusses how to properly do a work schedule and inspection of a construction site. The Module concludes with a hands on evaluation test and a written examination.
Remarks: None
Technique(s) of Delivery:
Small Group Instruction (SGI) (SG)
Hours
42.8
Security Clearance: Unclassified
Lesson Title: Prepare Materials Take Off List
References: TM 3-34-47
Lesson Title: Develop a Quality Assurance Control (QA-QC) Check List
References: TM 3-34.42
Lesson Title: Develop Work Schedule
References: TM 3-34.42
Lesson Title: Determine Technical Project Support Requirements
References: TM 3-34.42

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Module: C04 / 1
Title: Perform Soil Technician Supervisory Duties
Purpose: This module provides instruction on how to design a concrete mix as well as discusses how to determine the California Bearing Ration (CBR). It also provides instruction on determining soil stabilization using the required field sheets (DD Forms: 1206, 1207, 1208, 1209, 1794, and 2463). The Module concludes with a written examination.
Remarks: None

Technique(s) of Delivery:
Small Group Instruction (SGI) (SG)
Hours
30
Security Clearance: Unclassified
Lesson Title: Design Concrete Mix
References: FM 5-428 Concrete and Masonry (Chapters 2 & 3)
Lesson Title: California Bearing Ratio
References: FM 5-472 Materials Testing (Chapter 2 Section IX & Appendix B)
Lesson Title: Determine Soil Stabilization
References: FM 5-410 Military Soils Engineering (Chapters 6 & 9)
FM 5-430-00-1 Planning and Design of Roads, Airfields, and Heliports in the Theater of Operations – Road Design

Module: C05 / 1
Title: Determine Asphalt Design
Purpose: This module provides instruction on how to determine design requirements for asphalt mixtures, using both conventional methods and the Marshall Stability Test. The module concludes with written examination.
Remarks: None
Hours
30
Security Clearance: Unclassified
Lesson Title: Design Aggregate Blend to Meet Job Mix Specifications for Asphaltic Concrete
References: FM 5-472/TM 3-34.63
Lesson Title: Design Bituminous Mix by Marshall Stability Method
References: FM 5-472/TM 3-34.63

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Module: C06 / 1
Title: Prepare Roadway Designs
Purpose: This module provides instruction on how to select routes for proposed roads, horizontal & vertical curve restrictions, grade line & drainage requirements. It also discusses how to emplace the appropriate culvert to allow for proper flow of drainage. The Module concludes with a hands on evaluation test utilizing Terramodel software as well as a written examination..
Remarks: None
Technique(s) of Delivery:
Small Group Instruction (SGI) (SG)
Hours
40
Security Clearance: Unclassified
Lesson Title: Design and Draw the Roadway (Design Roads Steps)
References: FM 5-430-00-1 Planning and Design of Roads, Airfields, and Heliports in the Theater of Operations – Road Design (Chapters 9 & 11), Terramodel Manuals
Lesson Title: Determine Drainage Requirements
References: FM 5-430-00-1 Planning and Design of Roads, Airfields, and Heliports in the Theater of Operations – Road Design (Chapter 6)

Module: C07 / 1
Title: Process Surveying Data
Purpose: This module provides instruction on how to conduct and process an Obstruction Survey. This module utilizes Trimble surveying equipment and Trimble design software to provide elevations and locations of object that are not surveyable using construction survey methods. The students observe and process survey data, both in the field and in the classroom.
Remarks: None
Technique(s) of Delivery:
Small Group Instruction (SGI) (SG)
Hours
24
Security Clearance: Unclassified
Lesson Title: Trimble Business Center
References: Trimble Business Center Manuals

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Module: C08 / 1

Title: Geodetic and Airfield Heliport Survey
Purpose: This module focuses on the supervisory roles of Airfield survey missions, to include planning, processing and geodetic survey operations. A special emphasis will be place on obstruction chart survey as well as compilation reports using DA forms 5821, 5822 and 5827. The Module concludes with a written exam.
Remarks: None
Security Clearance: Unclassified
Technique(s) of Delivery:
Small Group Instruction (SGI) (SG)
Hours
37.5

Lesson Title: Plan Differential Global Positioning System (DGPS) Survey Project

References: FAA 405

Lesson Title: Prepare an Airfield/Heliport Obstruction Survey Chart

References: FAA 405

Lesson Title: Supervise Airfield/Heliport Obstruction and Navigational-Aid Survey

References: FAA 405

Lesson Title: Conduct a Project Briefing

References: FAA 405

Lesson Title: Prepare Project Progress Report

References: FAA 405

Lesson Title: Develop an Airfield-Heliport Obstruction and Navigational-Aid Compilation Report

References: FAA 405

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Module: D / 1

Title: Situational Training Exercise (STX)

Purpose: This module provides the students to incorporate everything they have learned throughout the course. In addition, it is the culminating event that allows for students to work on their tactical leadership skills to include their technical skills as well. The Module concludes with a performance evaluation on leadership in a tactical environment.

Remarks: None

Security Clearance: Unclassified

Technique(s) of Delivery:

Small Group Instruction (SGI) (SG)

Hours

72

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Written Examinations

Conduct Technical Construction Analysis
Perform Construction Management
Soil Technician Supervisory Duties
Determine Asphalt Design
Drainage
Conduct Geodetic Airfield Heliport Survey

Hands-on Examinations

Site Design
Road Designs
Materials Take-Off

Evaluations

APFT
Operational Environment Brief
Student-Led Discussions
Leadership Skills
Contribution to Group Work
Research Ability