AI for Network Engineers v1.0

COURSE CODE: AI-NE

PRICE: $2900 | DURATION: 3 DAYS | **FORMAT**: Kit & Lab | CLC 29

Course Description

The AI-NE – AI for Network Engineers course introduces network engineers to the fundamentals of Artificial Intelligence and its practical applications in networking. Participants will explore core AI/ML concepts, prompt engineering techniques, AI-driven network automation, and infrastructure design for AI workloads, while also addressing real-world integration challenges. Hands-on labs provide practical experience applying AI to monitoring, configuration, troubleshooting, and compliance in modern network environments.

Course Outline

Section 1: AI Foundations

Module 1: Introduction to AI and Machine Learning

- History and Significance of AI
- Machine Learning vs Deep Learning
- Essential AI Terminology and Concepts
- Relevance to Network Engineering

Module 2: Fundamental AI Concepts

- Supervised Learning
- Unsupervised Learning
- Reinforcement Learning

Section 2: Prompt Engineering for Network Professionals

Module 3: Prompt Engineering Essentials

- Fundamentals of Prompt Engineering
- Crafting Effective Prompts
- Common Pitfalls and Best Practices

Module 4: Lab – Practical Prompt Engineering

- Creating and Refining Prompts
- Network Troubleshooting and Documentation

Section 3: AI-driven Network Automation

    Module 5: AI for Network Monitoring and Remediation

- Automated Detection and Remediation

- Predictive Analytics in Network Management

    Module 6: AI-enhanced Provisioning and Configuration

- Network Provisioning Automation

- AI-driven Configuration Management

    Module 7: Lab – Implementing AI Network Automation

- AI Automation Scripts

Section 4: Network Infrastructure for AI Deployments

    Module 8: Designing Networks for AI Workloads

- Infrastructure Requirements for AI

- Dragonfly and Optimized Rails Topologies

    Module 9: High-Performance Networking Components

- GPU Networking: InfiniBand vs Ethernet

- Accelerators and Network Performance

    Module 10: Traffic Optimization for AI Networks

- AI Workload Traffic Patterns

- Congestion Management and Optimization

    Module 11: Scalability and Reliability in AI Networks

- Scalability Techniques

- High Availability and Load Balancing

- Wrap-Up and Advanced Topics

    Module 12: Real-World AI Integration Challenges

- Practical Considerations

- Integration Challenges and Strategies

Activity 1

1. Introduction to LLMs – Understanding what they are
2. Tokens & Context – Playing with text length
3. Prompt Basics – Asking questions the right way
4. Prompt Refinement – Iterating for better answers
5. LLMs for Troubleshooting – Using AI for BGP/OSPF issues
6. LLMs for Config Generation – Automating CLI templates
7. LLMs for Documentation – Summarizing configs & incidents
8. LLMs for Training – Explaining RFCs in simple terms
9. Open-Source LLMs – Running a small model locally
10. Practical Integration – Using LLMs in NetOps automation

Activity 2 – Labs

    Lab 0: Prompt Patterns for NetOps (warm-up)
    Lab 1: Intent → Cisco IOS-XE Config (structured)
    Lab 2: Vendor Translation: Cisco ⇄ Junos
    Lab 3: Syslog Triage & Regex Extraction
    Lab 4: Troubleshooting Decision Trees (BGP/OSPF)
    Lab 5: Ansible + Jinja2 From Inventory
    Lab 6: Network API Requests (Meraki or DNAC)
    Lab 7: Compliance Audit (Baseline vs Running Config)
    Lab 8: Change Plan & Peer Review Pack
    Lab 9: Incident Timeline → Postmortem