Vehicle Control Systems Training Course

Professional Development Training Course Outline

Category	Traffic Management & Road Safety	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The automotive industry is rapidly evolving with the integration of advanced vehicle control systems designed to enhance safety, efficiency, and driving experience. Vehicle Control Systems Training Course equips professionals with in-depth knowledge of modern automotive technologies, including Electronic Stability Control (ESC), Adaptive Cruise Control (ACC), Anti-lock Braking Systems (ABS), Traction Control Systems (TCS), and autonomous driving features. Participants will gain hands-on expertise in system architecture, sensor integration, and real-time diagnostics, preparing them for the next generation of smart vehicles.

With the rise of connected and autonomous vehicles (CAVs), mastering vehicle control systems has become a critical skill for engineers, technicians, and automotive enthusiasts. This course combines theoretical knowledge, practical simulations, and real-world case studies to ensure participants can design, troubleshoot, and optimize vehicle control systems. By the end of the training, learners will be proficient in understanding vehicle dynamics, embedded electronics, safety protocols, and regulatory compliance, making them invaluable assets in the modern automotive sector.

Programme Curriculum

Vehicle Control Systems Training Course

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Course Duration

5 days

Course Objectives

1. Understand the fundamentals of vehicle dynamics and control systems.
2. Gain expertise in Electronic Stability Control (ESC) and Anti-lock Braking Systems (ABS).
3. Learn the principles of Adaptive Cruise Control (ACC) and autonomous driving systems.
4. Explore sensor technologies, actuators, and real-time data acquisition.
5. Master traction control systems (TCS) and stability optimization.
6. Analyze fault diagnostics and predictive maintenance in vehicles.
7. Understand vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communication.
8. Develop skills in simulation and modeling of control algorithms.
9. Learn to integrate advanced driver-assistance systems (ADAS) for safety.
10. Understand regulatory standards, automotive safety compliance, and testing protocols.
11. Gain practical experience through case studies of real-world vehicle control failures and successes.
12. Explore machine learning and AI integration for predictive vehicle behavior.
13. Prepare for career advancement in automotive electronics, embedded systems, and autonomous vehicle development.

Target Audience

1. Automotive Engineers
2. Vehicle Dynamics Specialists
3. Embedded Systems Engineers
4. Automotive Technicians and Mechanics
5. Researchers in Autonomous Vehicle Technologies
6. Fleet Safety Managers
7. Robotics and AI Engineers focused on transportation
8. Students and graduates in Mechanical, Electrical, or Automotive Engineering

Course Modules

Module 1: Introduction to Vehicle Control Systems

- Overview of vehicle dynamics and control fundamentals
- Historical evolution of control systems in automobiles
- Types of control systems: mechanical, hydraulic, electronic
- Key components and architecture of modern vehicle control systems
- **Case Study:** ESC implementation in passenger vehicles

Module 2: Braking and Traction Control Systems

- Anti-lock Braking System (ABS) design and operation
- Traction Control Systems (TCS) principles
- Electronic Brake-force Distribution (EBD)
- Integration of braking and traction systems with vehicle sensors
- **Case Study:** TCS failure and lessons learned from real-world accidents

Module 3: Adaptive Cruise Control (ACC) and Driver Assistance Systems

- Fundamentals of ACC and distance control
- Sensor integration: radar, LiDAR, and cameras
- Lane keeping and lane departure warning systems
- Adaptive speed and collision avoidance strategies
- **Case Study:** ACC performance in mixed traffic conditions

Module 4: Vehicle Dynamics and Stability Control

- Steering, suspension, and yaw control principles
- Electronic Stability Control (ESC) algorithms
- Vehicle roll and pitch management
- Integration with braking and traction systems
- **Case Study:** ESC effectiveness in emergency maneuvers

Module 5: Sensor Technologies in Modern Vehicles

- Types of sensors: ultrasonic, radar, LiDAR, inertial measurement units (IMUs)
- Sensor fusion for accurate vehicle positioning
- Real-time data acquisition and processing
- Fault detection and sensor calibration
- **Case Study:** Sensor failure diagnostics in autonomous prototypes

Module 6: Embedded Systems and Control Algorithms

- Microcontrollers and electronic control units (ECUs)
- Software architecture for vehicle control
- Feedback control loops and PID controllers
- Implementation of real-time algorithms
- **Case Study:** ECU integration in hybrid electric vehicles

Module 7: Safety, Testing, and Regulatory Compliance

- Automotive safety standards (ISO 26262, UNECE regulations)
- Crash testing and electronic system validation
- Diagnostic tools and compliance reporting
- Risk assessment and mitigation strategies
- **Case Study:** Regulatory compliance in automated braking systems

Module 8: Future Trends and Autonomous Vehicle Control

- Connected vehicle technologies (V2V, V2I)
- Machine learning for predictive vehicle behavior
- Electric and autonomous vehicle integration
- Smart traffic systems and IoT applications in vehicles

- **Case Study:** AI-based predictive braking in autonomous shuttles

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call +254769199797

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

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