

Advanced Driver Assistance Systems (ADAS) Fundamentals

eLearning courses designed to increase productivity and profits



Learning Made Simple, Visual, and Interactive

The THORS *Advanced Driver Assistance Systems (ADAS) Fundamentals* course introduces the learner to ADAS components, such as sensors, Electronic Control Units (ECUs), hardware accelerators, Human Machine Interfaces (HMIs), actuators, communication modules, Inertial Measurement Units (IMUs), and a Global Positioning System (GPS) module. This course also provides interactive learning on the ADAS autonomy levels, architecture, software layers, Operational Design Domain (ODD), and safety and security regulations.

Credit Hours **2**

Learning Objectives

- Identify the components of ADAS and their functions.
- List the communication modules used inside ADAS.
- Recall the five different autonomy levels in vehicles.
- Explain the different layers in ADAS architecture.
- Understand the concept of Operational Design Domain (ODD) within ADAS.
- Elaborate on functional safety, Safety of the Intended Functionality (SOTIF), and cybersecurity in ADAS.

Table of Contents

I. ADAS Components

- **Sensors**
 - ▣ Cameras
 - ▣ Radar Sensors
 - ▣ Light Detection and Ranging (LiDAR) Sensors
 - ▣ Ultrasonic Sensors
- **Electronic Control Units (ECUs)**
- **Human Machine Interfaces (HMIs)**
- **Actuators**
 - ▣ Acceleration
 - ▣ Steering
 - ▣ Braking

I. ADAS Components (Cont.)

- **Communication Modules**
 - ▣ Controller Area Network (CAN)
 - ▣ Local Interconnect Network (LIN)
 - ▣ FlexRay
 - ▣ Vehicle to Everything (V2X) Communication
- **Inertial Measurement Units (IMUs)**
- **Global Positioning System (GPS) Module**

II. ADAS Concepts

- **Autonomy Levels**
- **Software Layers**
- **ADAS Architecture**
- **Operational Design Domain (ODD)**
- **Safety and Security Regulations**
 - ▣ Functional Safety
 - ▣ Safety of the Intended Functionality (SOTIF)
 - ▣ Cybersecurity

