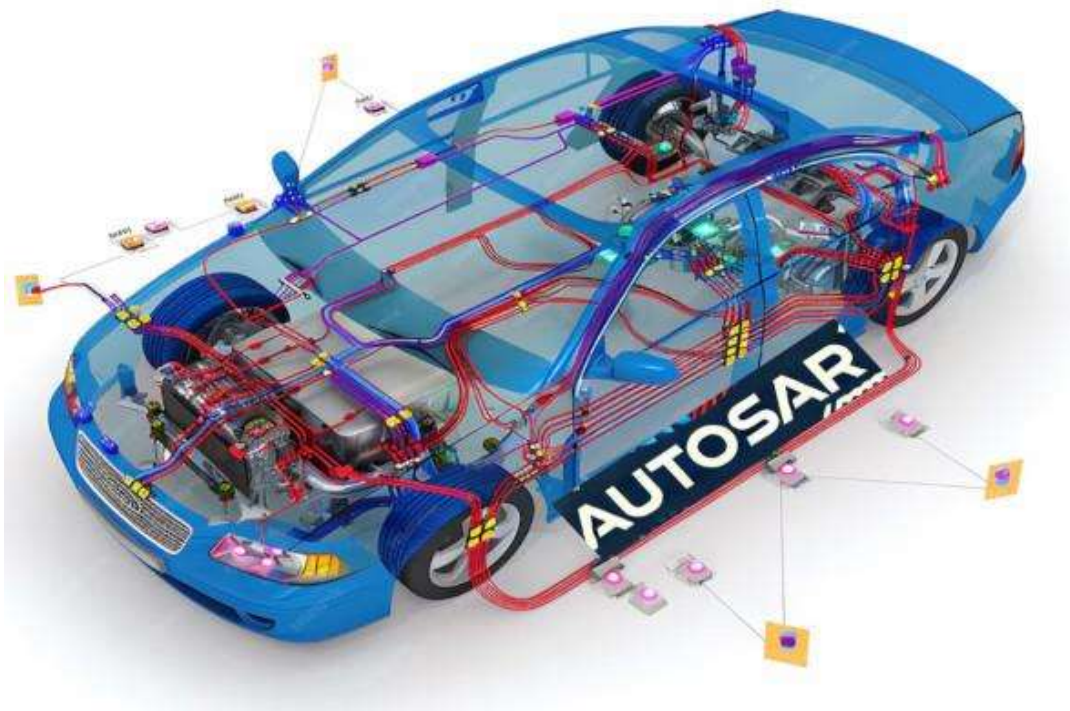




AUTOSAR CRASH COURSE SYLLABUS



6-MONTH COMPLETE AUTOSAR ENGINEER PROGRAM (24 Weeks)

Full Stack: Classic + FULL BSW + MCAL + CAN/LIN/Eth + Diagnostics + Crypto Stack

Module 1- AUTOSAR Foundations & Architecture (Weeks 1–4)

WEEK-1:

- AUTOSAR Classic Platform Deep Dive
- ECU Software Architecture
- Communication Basics — CAN, CAN-FD, LIN, Ethernet

WEEK 2:

- System Extract, ECU Extract, SWC Extract
- Data Types, Interfaces, Signal Mapping

WEEK 3:

- SWC Architecture — S/R, C/S, Mode Switch
- Runnable Mapping Models

WEEK 4:

- RTE- Contract Phase, APIs, Signal Access
- Practical RTE Generation in DaVinci Developer

Module 2 — Application Layer & ARXML (Weeks 5–8)**WEEK 5:**

- Multi-SWC Architecture
- Layered RTE Communication

WEEK 6:

- RTE Internals + Generated Functions
- Mode Switch Handling

WEEK 7:

- ARXML- DataTypeMappingSet, PortInterfaces, ComponentTypes
- ComplexCompositions

WEEK 8:

- RTE + OS + Schedule Alignment
- SWC Validation using TESAF

Module 3 — FULL MCAL DRIVERS (Weeks 9–12)**WEEK 9:**

- DIO - Digital I/O Channel Configuration, Signal Mapping & ECU Integration
- Port - Pin Multiplexing, Direction Control & Hardware Integration

WEEK 10:

- Mcu - Clock Initialization, Reset Handling & System Startup Control
- GPT — Timer Configuration, Event Scheduling & Time Management

WEEK 11:

- PWM — Duty Cycle Generation & Actuator Control
- ADC — Analog Signal Sampling & Data Acquisition

WEEK 12:

- CAN — Controller Setup & Network Integration
- CAN-FD — High-Speed Data Rate Configuration & BRS Support
- LIN — Schedule Table, Node Configuration & Diagnostic Frames

Testing for CAN & LIN:

- ✓ PCAN-View
- ✓ TESAF CAN & LIN Analyzer

Module 4 — Communication Stack (Weeks 13–16)

WEEK 13 — CAN Stack

- COM + PduR + CanIf + CanDrv
- Multi-PDU Routing
- Testing via PCAN + TESAF

WEEK 14 — LIN Stack

- LDF Interpretation
- Schedule Tables
- Testing via TESAF LIN Analyzer

WEEK 15 — Ethernet Stack

- Ethernet Interface
- TCP/IP, UDP
- Ethernet Frame Routing
- TESAF Ethernet Trace Window

WEEK 16 — SOME/IP

- SOME/IP Message Structure
- Service Discovery Protocol
- Testing via TESAF

Module 5 — FULL BSW MODULES (Weeks 17–20)

WEEK 17 — Diagnostics

- DCM — Sessions, Security, Routines, IO Control
- DEM — DTC Logging, Event Reporting, Freeze Frames
- Testing: TESAF UDS Panel + PCAN-View

WEEK 18 — Memory Stack

- NvM — Blocks, Datasets, Admin Blocks
- Fee — Flash EEPROM Emulation
- Ea — EEPROM Abstraction

WEEK 19 — System Services

- BswM — Mode Arbitration & Coordination
- EcuM — ECU Startup, Shutdown & Wakeup
- SchM — Exclusive Area Management

WEEK 20 — Watchdog Management

- WDGM — Supervision Modes, Triggering & Fault Handling

Module 6 — Crypto Stack + OEM Workflow + Final Project (Weeks 21–24)

WEEK 21 — OEM AUTOSAR Workflow

- OEM Workflows — VW, BMW, GM, Stellantis
- Multi-ECU System Integration
- ARXML Merge & Validation

WEEK 22 — Multi-bus Integration

- Multi-CAN, Multi-LIN, Ethernet Gateways
- Testing Complete System using:
 - PCAN-USB
 - TESAF (CAN + LIN + Eth)

WEEK 23 — AUTOSAR Crypto Stack

- Crypto Service Manager (Csm)
- Crypto Interface (CryIf)
- Crypto Driver (Crypto)
- Key Management, Certificates, Trust Anchors
- Secure Onboard Communication (SecOC)
- Secure Key Handling & Crypto Job Processing
- TESAF-Based Crypto Signal Testing

WEEK 24 — Final Major Project

- Fully Integrated AUTOSAR ECU:
 - Multi-SWC Application
 - CAN + LIN + Ethernet
 - DCM + DEM + NvM + WDGM + Crypto Stack
 - Testing Entire ECU using TESAF + PCAN
 - Final Evaluation & Review

3-MONTH AUTOSAR TRAINING (FOR WORKING ENGINEERS)

CAN Stack Only — 12 Weeks

Module 1 — Application Layer + RTE (Weeks 1–4)

WEEK 1 — AUTOSAR Architecture (Deep)

- AUTOSAR Layers (Application, RTE, BSW, MCAL)
- ECU Extract, System Extract, SWC Extract
- Interface & Data Mapping
- PortToSignals + Runnables

WEEK 2 — SWC Engineering (Advanced)

- Multi-SWC Architecture
- Sender/Receiver & Client/Server Implementations
- Runnable Scheduling Models
- Port–RTE–Signal Mapping

WEEK 3 — RTE Deep Dive

- Contract Phase Details
- RTE Generation Internals
- Generated API Usage
- Signal Access Methods

WEEK 4 — ARXML Engineering

- System Extract Internals
- PortPrototype & Interface Mapping
- DataTypeMappingSet
- ARXML Validation Workflow

Module 2 — CAN COMMUNICATION STACK (Weeks 5–8)

WEEK 5 — CAN MCAL Driver

- CAN — Controller Setup, Message Handling & Bit Timing
- Hardware-Level CAN Behavior
- Testing CAN Frames with PCAN-View

WEEK 6 — CAN Interface (CanIf)

- Channel Abstraction & Hardware Mapping
- PDU Handling, Tx/Rx Confirmation
- Integration with PduR & COM

WEEK 7 — PDU Router (CAN Path Only)

- Routing Path Definitions
- Gateway Routing
- I-PDU to L-PDU Mapping
- End-to-End Signal Flow

WEEK 8 — COM Stack

- COM Signal Configuration
- Tx/Rx Modes
- Minimum Delay Time, Periodic PDUs
- Test COM Routing with TESAF CAN Trace Window

Module 3 — Limited BSW + ECU Integration (Weeks 9–12)**WEEK 9 — ECU State Management**

- ECU Init, RUN, Shutdown
- Basic EcuM Concepts

WEEK 10 — Basic NvM

- NvM Block Definitions
- RAM/ROM Synchronization

WEEK 11 — Diagnostic Fundamentals

- UDS — 0x10, 0x11, 0x22 (Concept Only)
- No DCM Implementation (as per requirement)

WEEK 12 — CAN Integration Project

- Full COM + PduR + CanIf + CAN
- Testing via
 - PCAN-View
 - TESAF Trace Window
 - Final Project Demo

1-MONTH AUTOSAR CRASH COURSE (4 WEEKS)

MODULE 1 — Automotive & AUTOSAR Foundations (Week 1)

- Automotive ECU Architecture, Vehicle Domains & Functional Overview
- CAN, CAN-FD & LIN Fundamentals — Arbitration, Signaling, Framing
- AUTOSAR Classic Layered Architecture — Application, RTE, BSW, MCAL
- AUTOSAR ECU Workflow — System Extract, ECU Extract, SWC Extract
- Hands-on Observation: CAN Signals using PCAN-USB + PCAN-View

MODULE 2 — AUTOSAR Application Layer (Week 2)

- SWC Basics — Sender/Receiver, Client/Server, Mode Switch
- Runnable Types — Timing Events, Mode Switch Events, Data Events
- RTE Fundamentals — Contract Phase, RTE Generation & API Understanding
- ARXML Basics — Interfaces, Ports, ComponentTypes, DataTypes
- Practical: Build Simple SWCs + Generate RTE in DaVinci Developer

MODULE 3 — Basic BSW & ECU Configuration (Week 3)

- BSW Overview — Communication, Diagnostics, Memory, System Services
- Introduction to CAN Stack (High Level)
- BSW Configuration using EB Tresos
- Build Process — Configuration, Code Generation, Linking Flow
- Testing RTE + Application Execution using TESAF

MODULE 4 — Mini AUTOSAR Project (Week 4)

- Build 2–3 SWC AUTOSAR Application
- Generate RTE, Connect Ports, Setup Inter-SWC Signals
- Configure Basic COM Signal Transmissions
- Test CAN Signals using PCAN-View
- Validate PDU Flow using TESAF CAN Trace Window