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# Certified Embedded Associate AUTOSAR Adaptive

## Agenda VectorAcademy

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| **Delivery Format:** | This course is offered as a blended learning. |
| **Duration:** | 4 weeks (~42 hours)<br>Approx. 32 hours of self-study (via E-Learning) + 9 hours of remote sessions<br>(1 hour welcome session and 4 Q&A sessions of 2 hours).<br>Access to the Virtual Machine: 2 months, starting with welcome session<br>Exam: 45 minutes |
| **Target Group:** | Project Leader, Software Developers/Specialists, AUTOSAR ECU Developer and Integrators |
| **Prerequisites:** | Knowledge about software development for automotive systems, basic programming knowledge. |
| **Goal:** | Understand the fundamental concepts of the AUTOSAR Adaptive Platform and its role in shaping modern vehicle software (applications, service communication, runtime services).<br>Understand how adaptive applications make use of essential platform services such as logging, persistency, diagnostics, updates, safety, and security.<br>Get to know the configuration principles supported by Vector's Adaptive toolchain. |

1. **Basics**
   - Overview and objectives
   - AUTOSAR Adaptive architecture

2. **MICROSAR Adaptive CSP**
   - Basic knowledge about the Vector MICROSAR Adaptive CSP

3. **Workflow**
   - General workflow from model to application
   - Overview of the ARXML modeling
   - Fundamental use of the DaVinci Developer Adaptive
   - AUTOSAR manifest file types
   - Introduction to practical exercise

4. **Adaptive Application**
   - Basic principles and technical concepts
   - AUTOSAR design elements

5. **Logging**
   - Function overview of logging cluster
   - Diagnostic log & trace framework with resource monitoring
   - Practical exercise

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6. **Execution and State Management**
   - AUTOSAR Adaptive startup behavior
   - Function groups and the machine states
   - Practical exercise

7. **SOME/IP Communication**
   - Principles of Service-oriented communication
   - Service discovery and interaction during runtime
   - Method calls, events, and fields
   - Protocol features: (de)serialization, remote procedural calls, publish/subscribe

8. **Communication Management**
   - Overview of communication middleware
   - Communication protocols: SOME/IP, IPC, External IPC, Zero-Copy Binding
   - Service-oriented communication via ara::com APIs
   - Runtime connection and location transparency
   - Hands-on experience

9. **Persistency**
   - Key-Value and File-based storage
   - Data retention across power cycles
   - Redundancy mechanisms (CRC and N-out-of-M recovery)
   - Hands-on experience

10. **Security**
    - Overview of security goals and its impact
    - Secure communication via TLS and SecOC
    - Cryptography

11. **Functional Safety**
    - General Introduction to safety concepts
    - AUTOSAR Adaptive safety features: PHM, E2E, Time-sync and Safe-IPC
    - Safe communication and safe execution

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**12. Diagnostics Management**

- Unified diagnostic services
- From diagnostic extract to diagnostic services.
- Diagnostic event management
- Practical exercise

**13. Update Management**

- Software lifecycle management via UCM
- Secure handling of software packages and manifests.

**14. Vector**

- Communication channels to vector

**Schedule:**

