



**PELMOB**



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## **D5.4 Undergraduate/Master Curricula Implemented**

**Title of Course**

**Automotive Systems and Software Engineering**

**Title of the presentation**

**AUTOSAR - Automotive open system architecture 2**

**др Александар Жорић**

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**Partnership for Promotion and Popularization of Electrical Mobility through Transformation and Modernization of WB HEIs Study Programs/PELMOB**

Call: ERASMUS-EDU-2022-CBHE-STRAND-2

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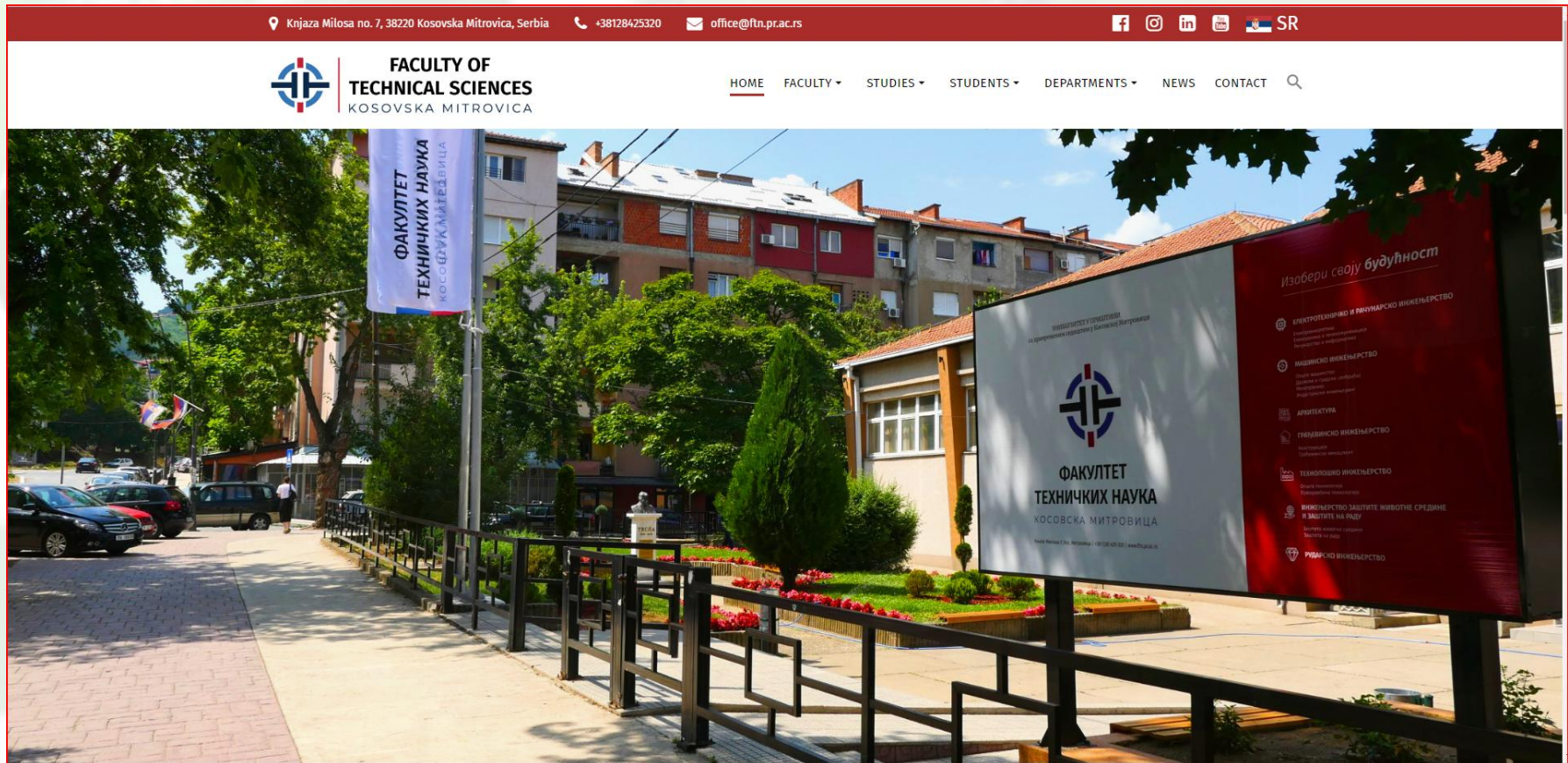


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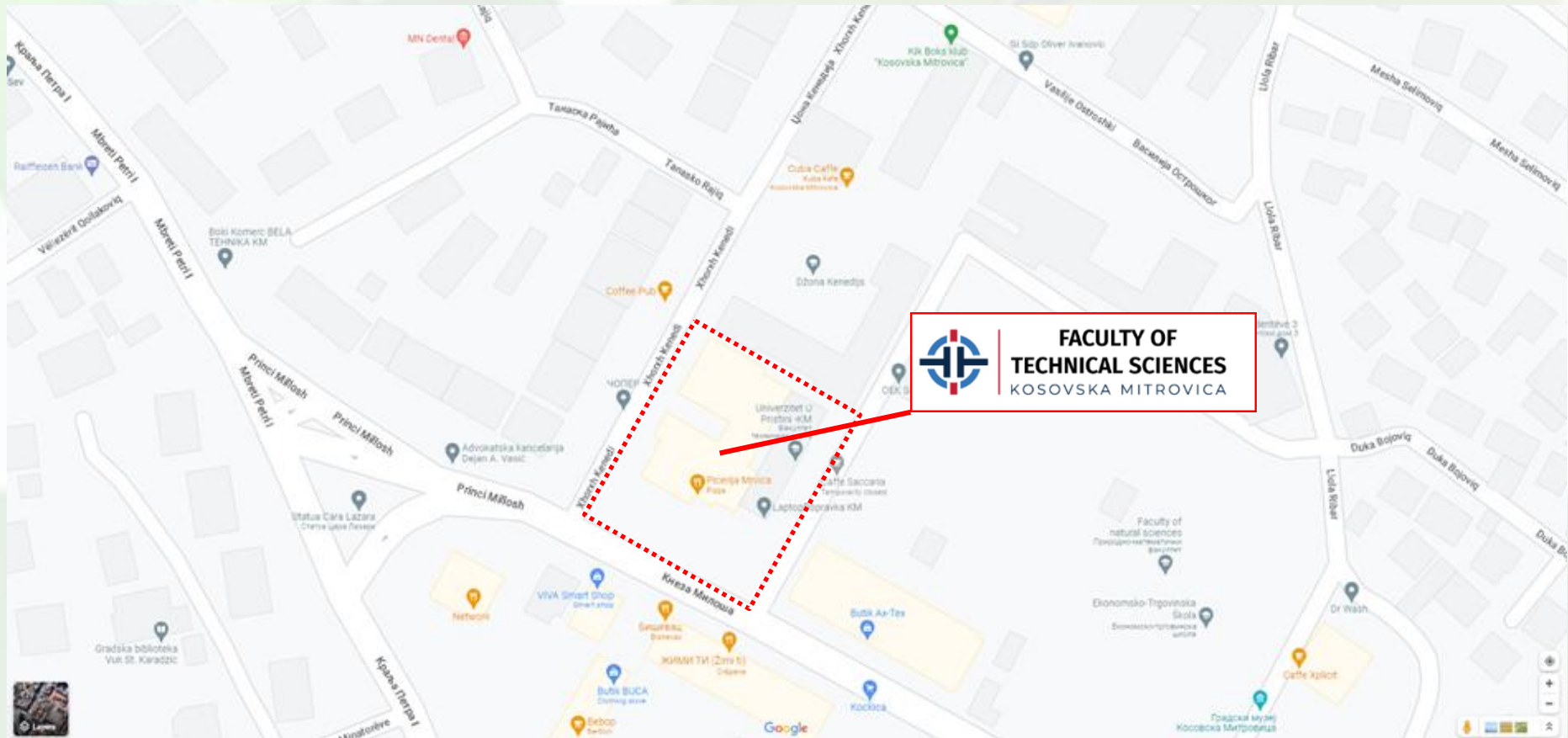
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# Automotive Systems and Software Engineering

## AUTOSAR - Automotive open system architecture



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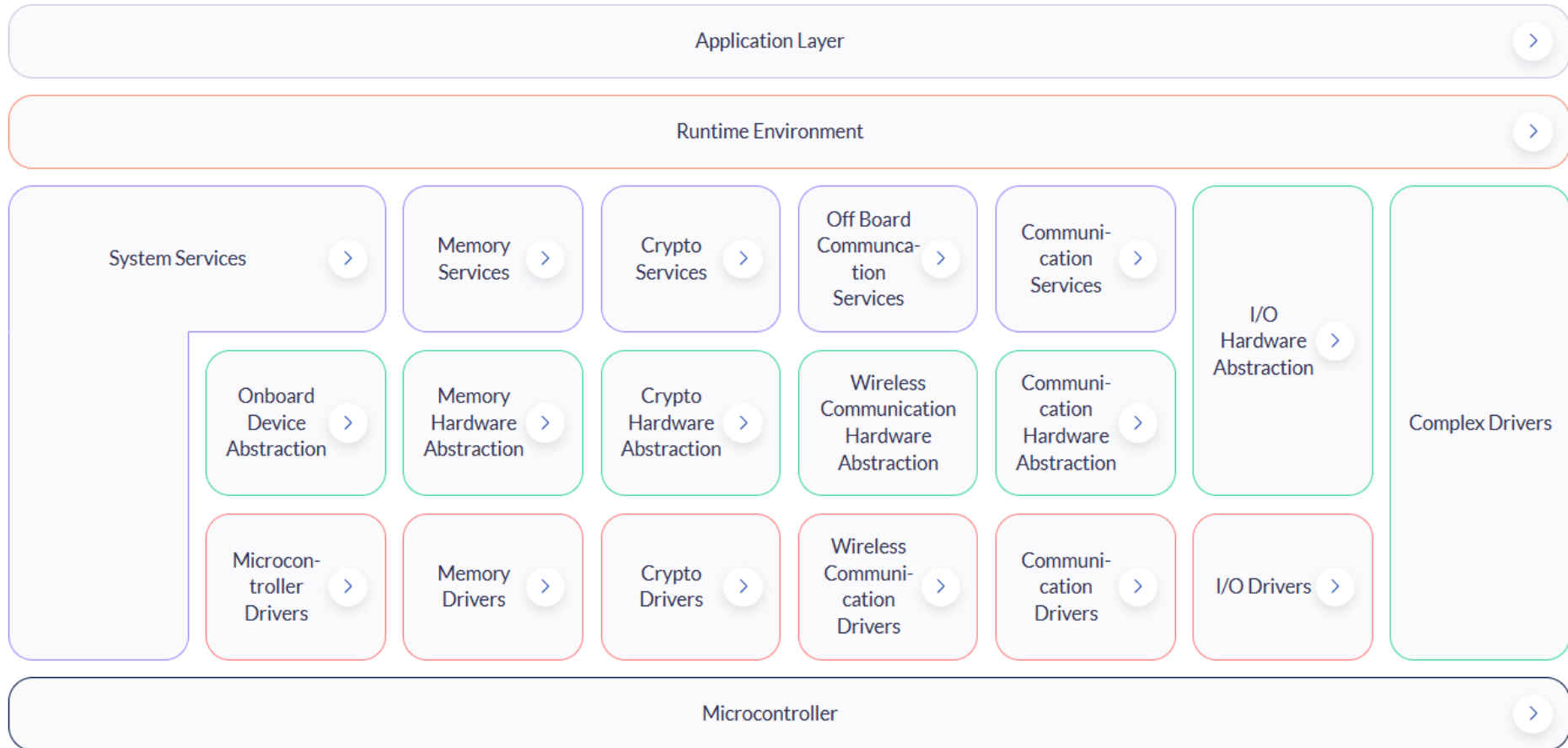


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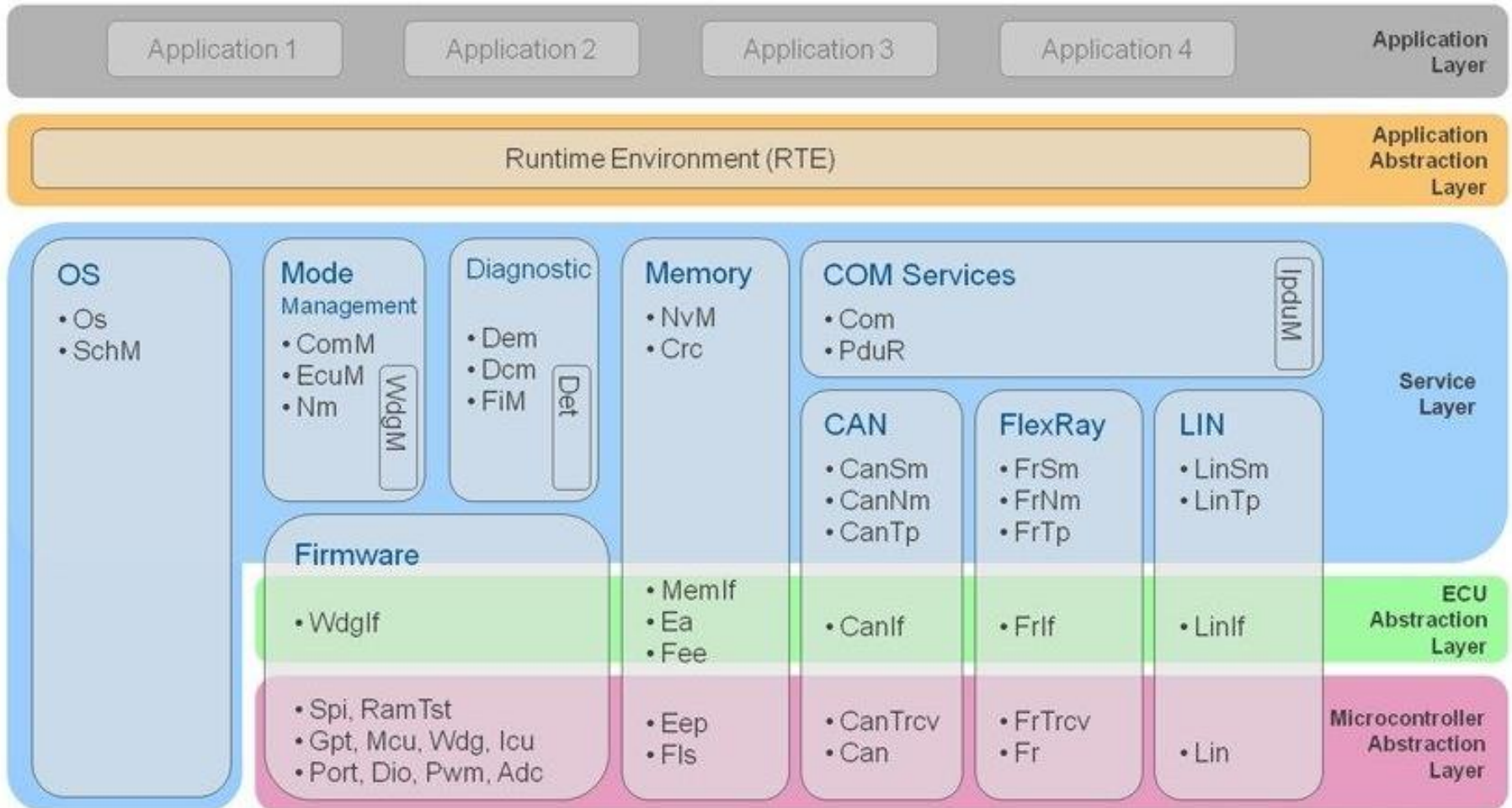


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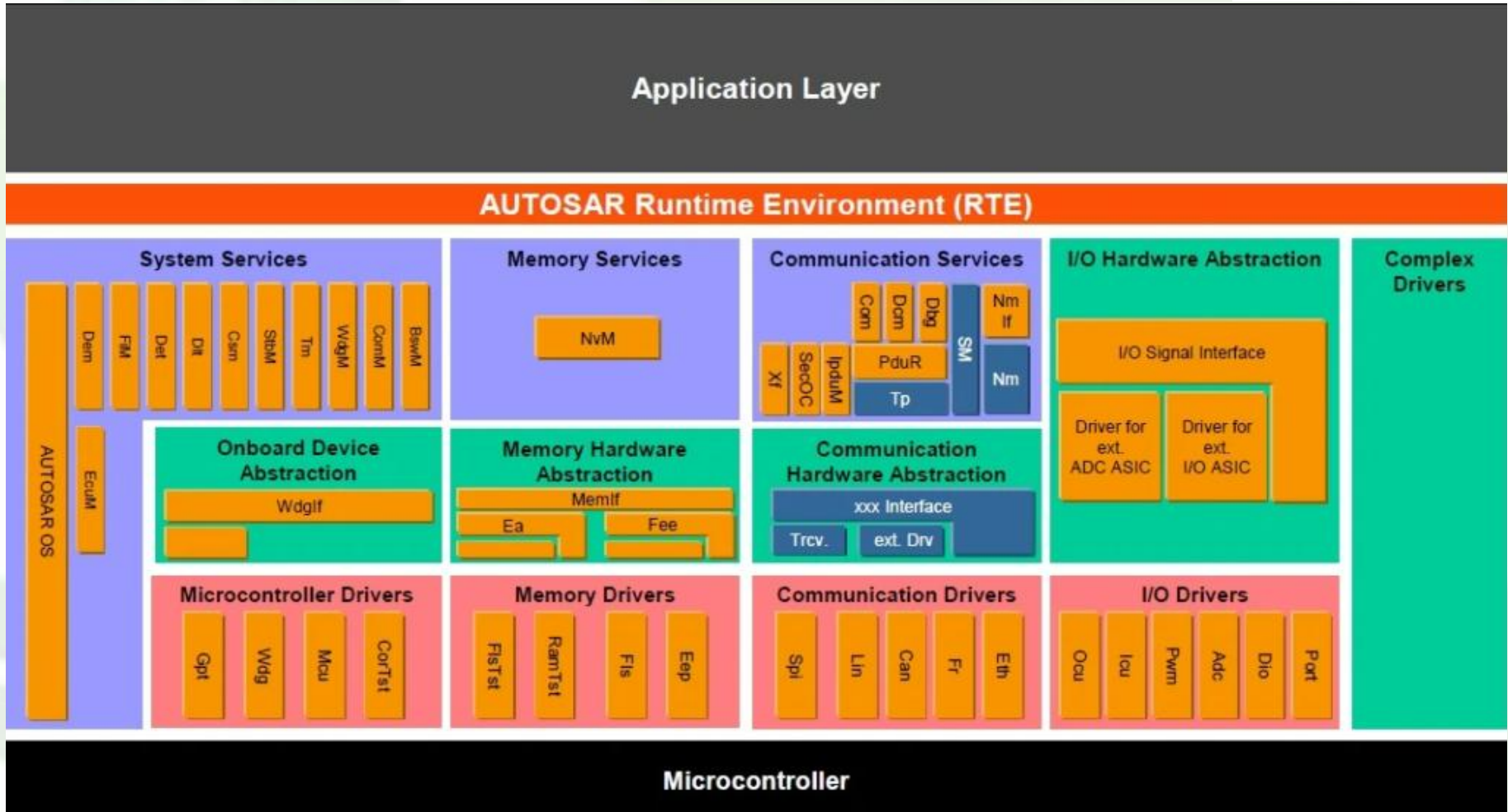
### AUTOSAR Classic Release R24-11



### AUTOSAR Layered Architecture



### AUTOSAR Layered Architecture

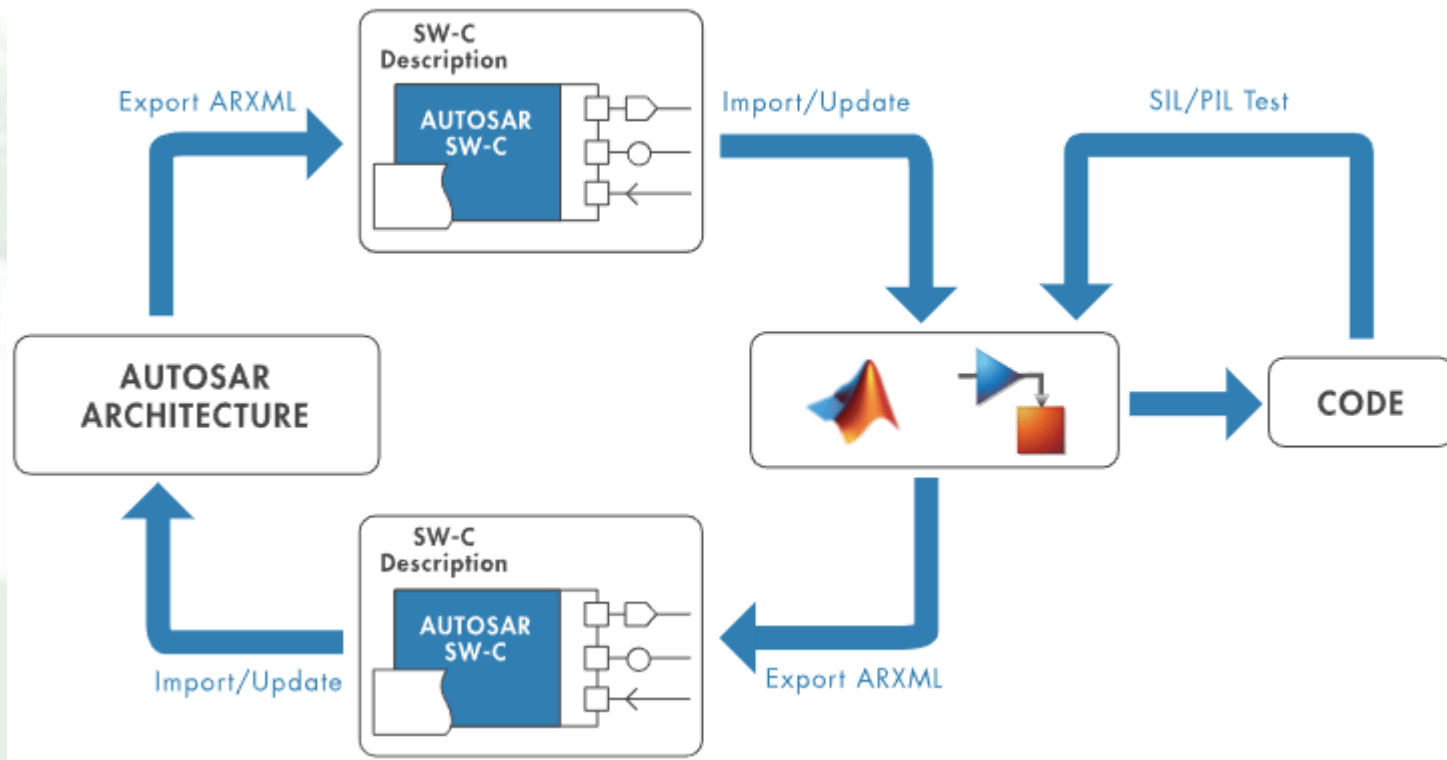


### AUTOSAR Blockset

### Design and simulate AUTOSAR software



Simulink® natively supports the AUTOSAR standard.



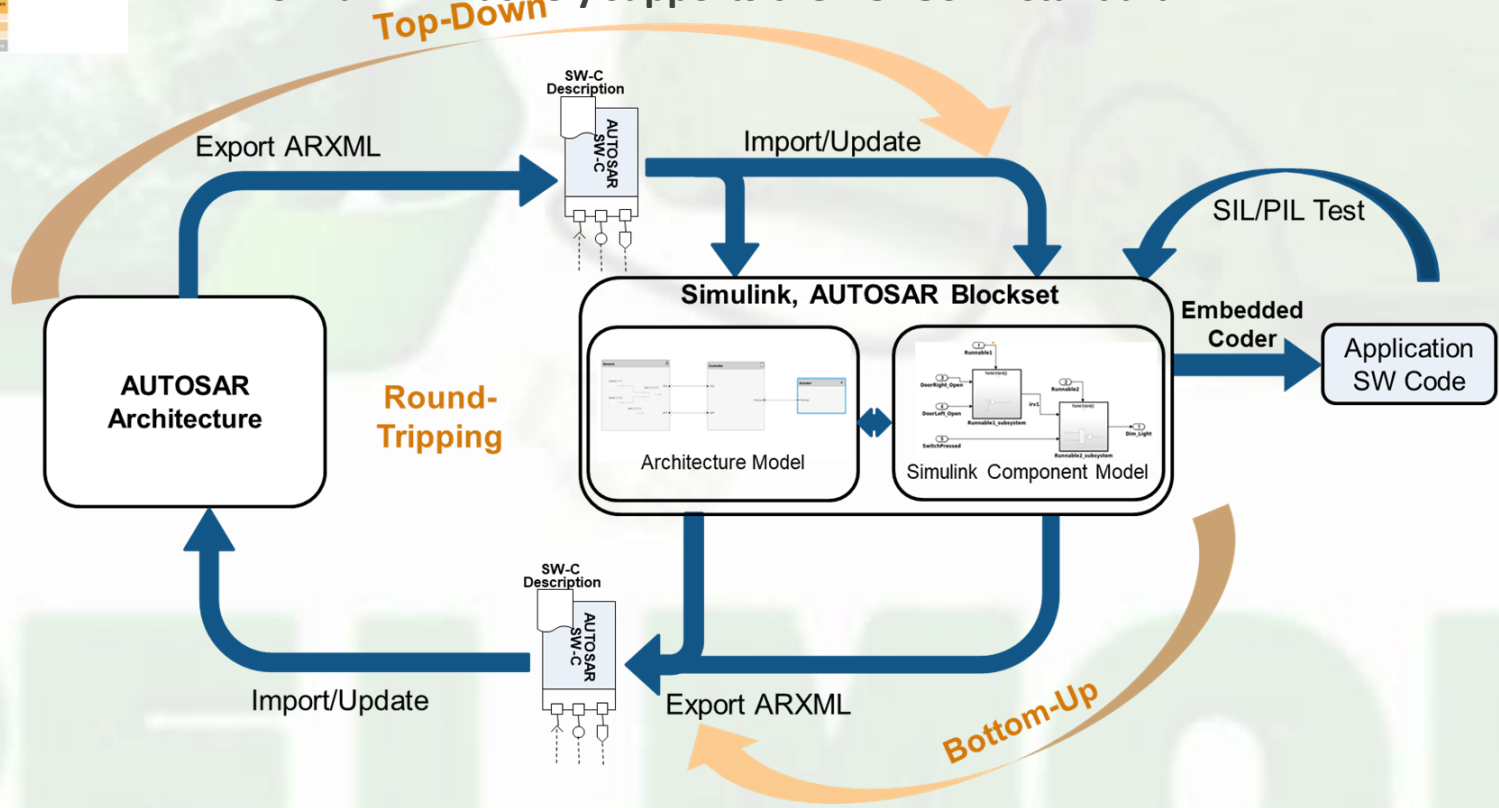
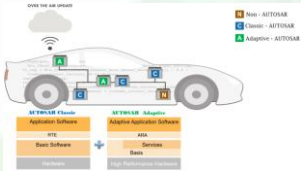
Simulink, AUTOSAR Blockset, and Embedded Coder support round-trip integration with AUTOSAR architectures

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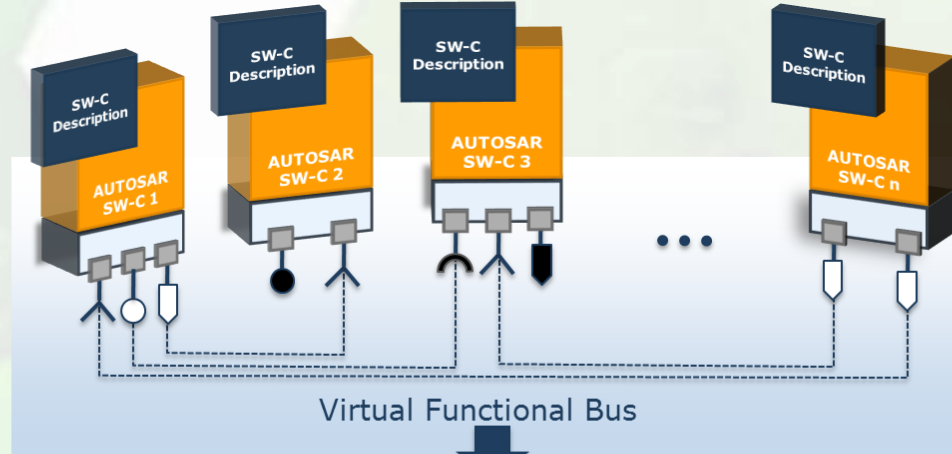
Top-Down



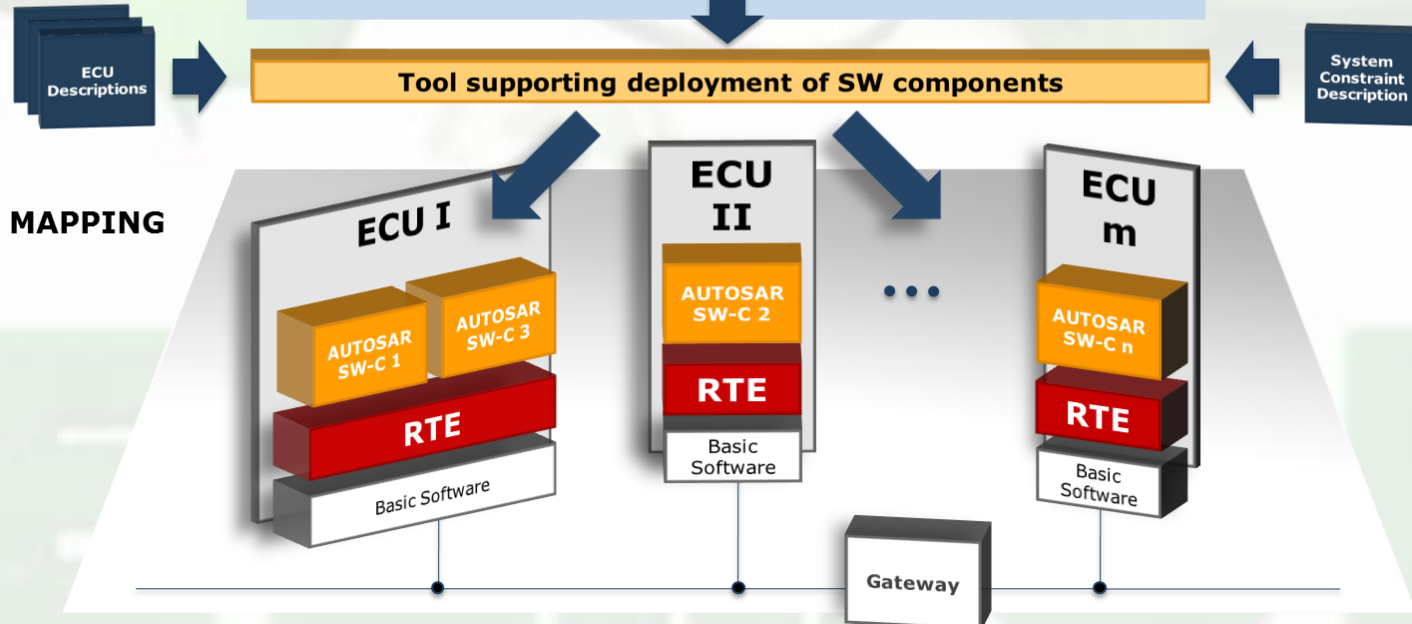
Simulink, AUTOSAR Blockset, and Embedded Coder support round-trip integration with AUTOSAR architectures

AUTOSAR Automotive industry Computer Software Functional safety ETAS,

VFB view



MAPPING





AUTOSAR (Automotive Open System Architecture) represents a revolutionary standard in automotive software development, with its primary goals being standardization, modularity, and scalability. Through a partnership of over 300 companies (including Bosch, Continental, Volkswagen), AUTOSAR enables:

#### 1. Interoperability and cost reduction

A common framework for ECU integration, accelerating development and facilitating collaboration between OEMs and Tier 1 suppliers.

Support for over-the-air (OTA) updates and cryptographic security (e.g., SecOC).

#### 2. Two Key Platforms

##### •Classic Platform (CP):

Designed for safety-critical real-time systems (engine, brakes).

Uses OSEK/VDX OS and static configuration.



# Automotive Systems and Software Engineering

## AUTOSAR - Automotive open system architecture



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### Conclusion on AUTOSAR Architecture in the Automotive Industry



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- **Adaptive Platform (AP):**
- Enables **dynamic systems** (autonomous driving, infotainment).
- Runs on **POSIX-based OS** (Linux, QNX) and supports **AI/ML**.

#### 4. Layered Architecture

- **Application Layer (SW-Cs)** and **RTE (Runtime Environment)** for communication.
- **System Services** (NVM, UDS diagnostics) and **Hardware Abstraction Layer (HAL)**.
- Support for **complex drivers** and **microcontroller layers** (CAN, SPI, AES).

#### 5. Development Tools

- **Simulink** and **AUTOSAR Blockset** streamline design through **round-trip integration** and **code generation (ARXML)**.

#### 6. Future Trends

- Focus on **electrification**, **autonomous driving**, and **cybersecurity**.
- Support for **mixed-criticality systems** (integration of CP and AP on the same hardware).