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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

Project Number: 101082860

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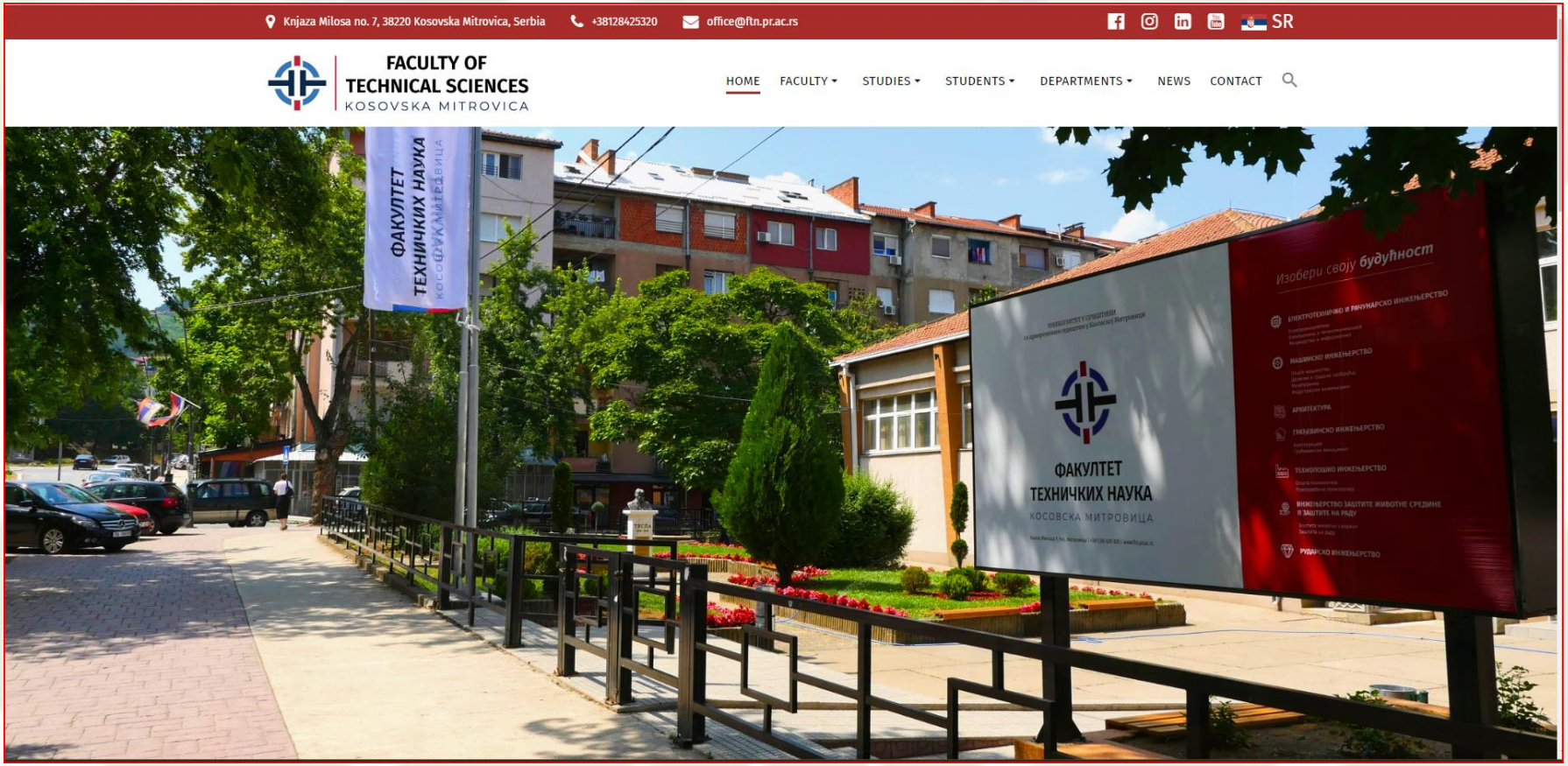

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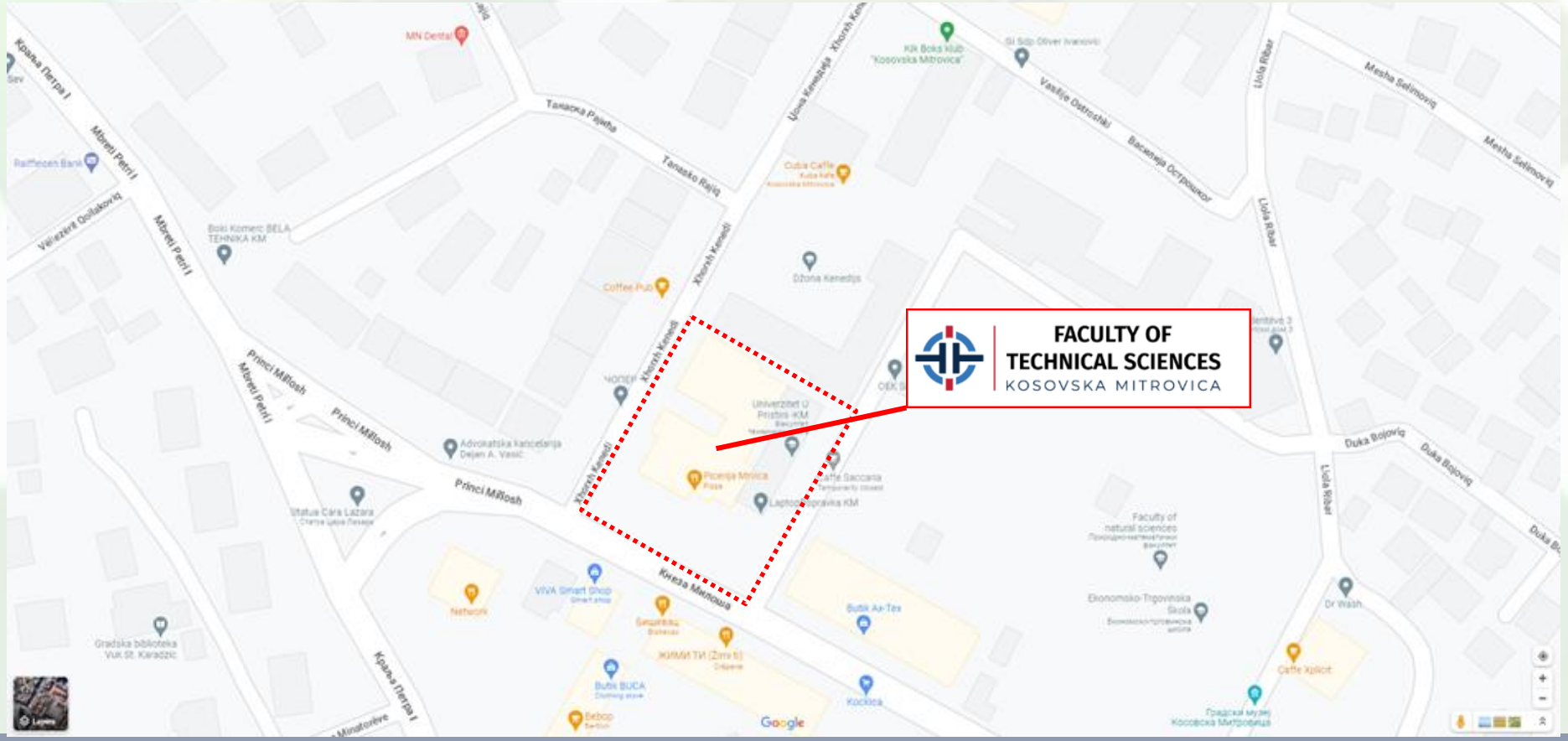

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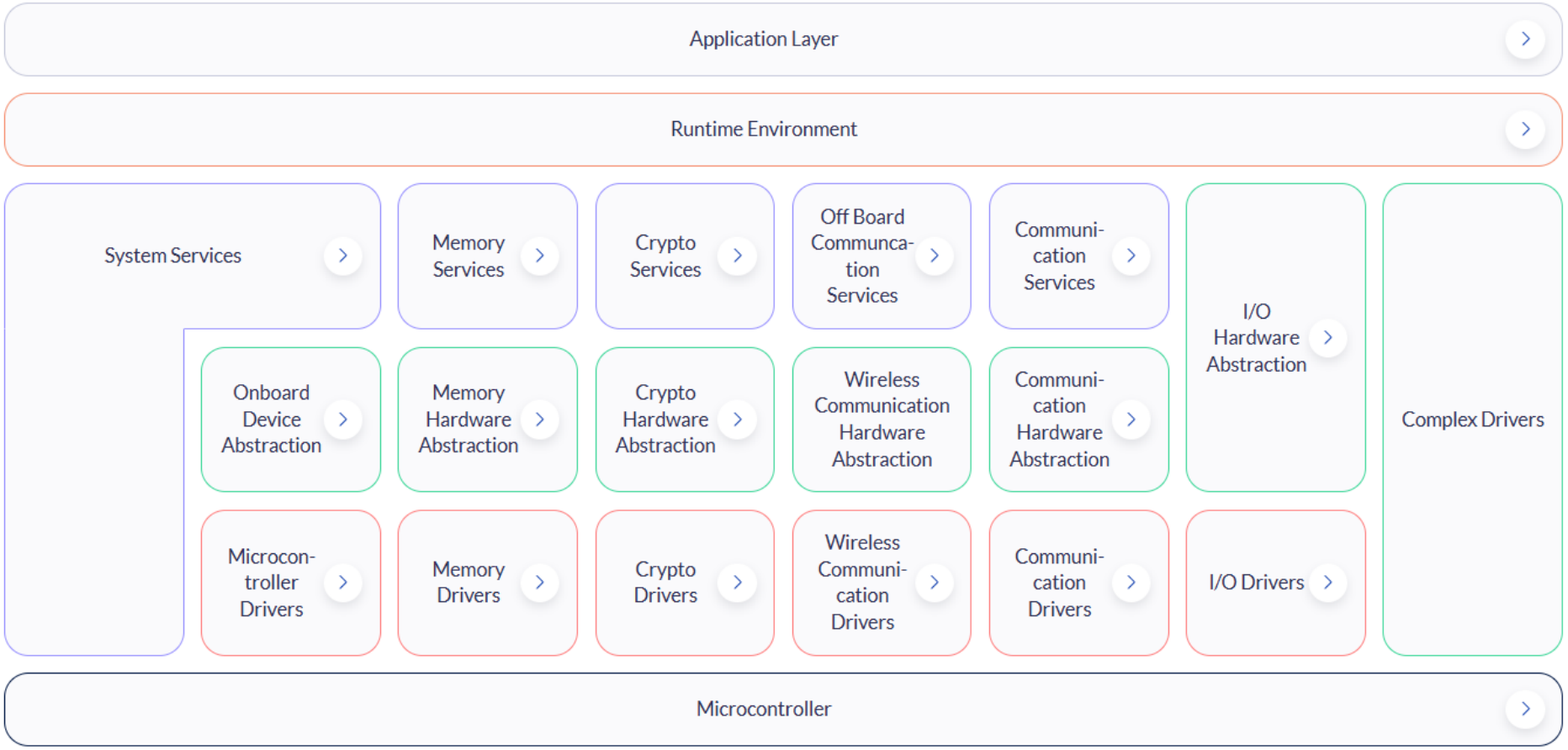
Automotive Systems and Software Engineering

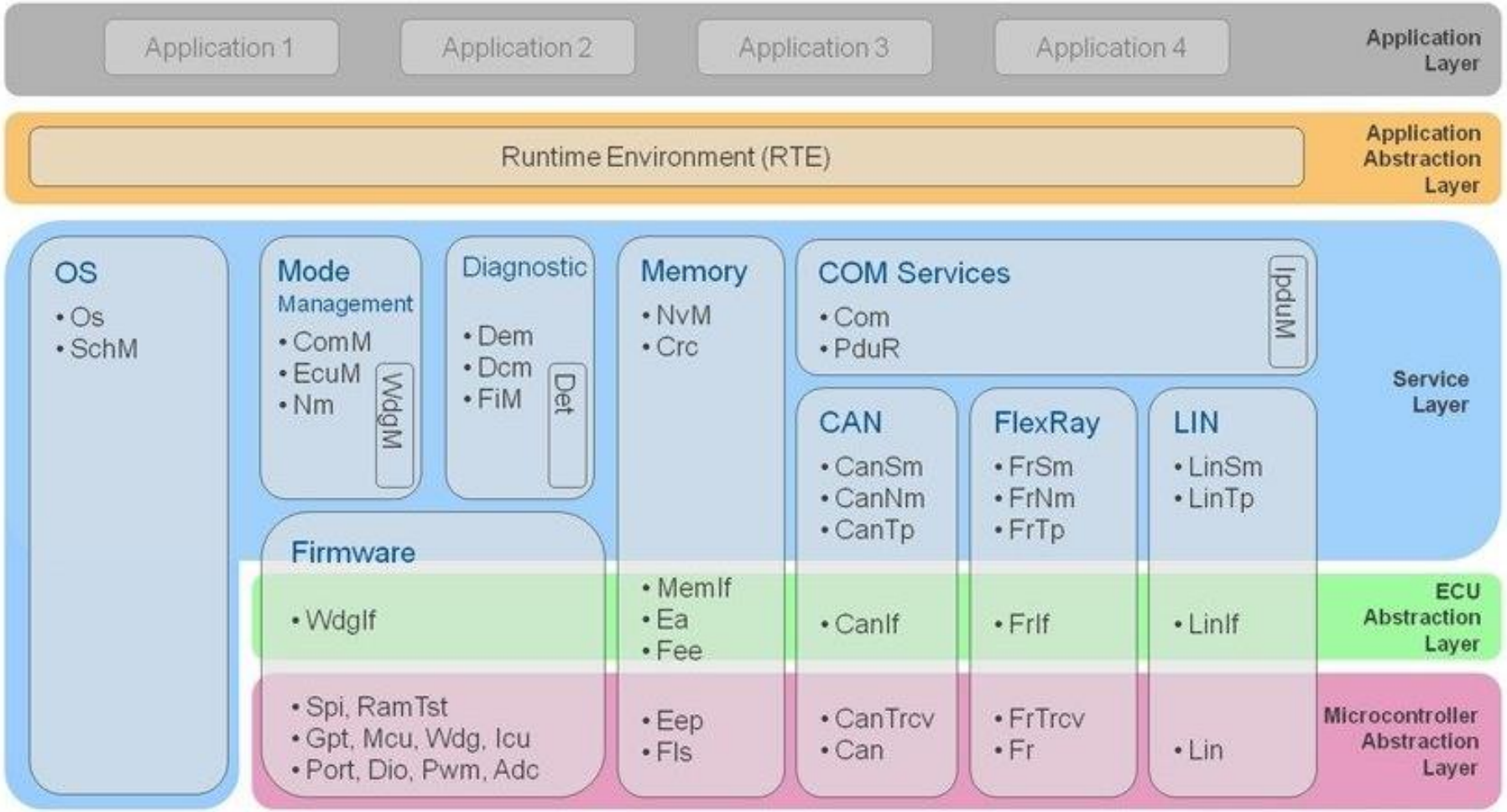
AUTOSAR - Automotive open system architecture

AUTOSAR Classic Release R24-11

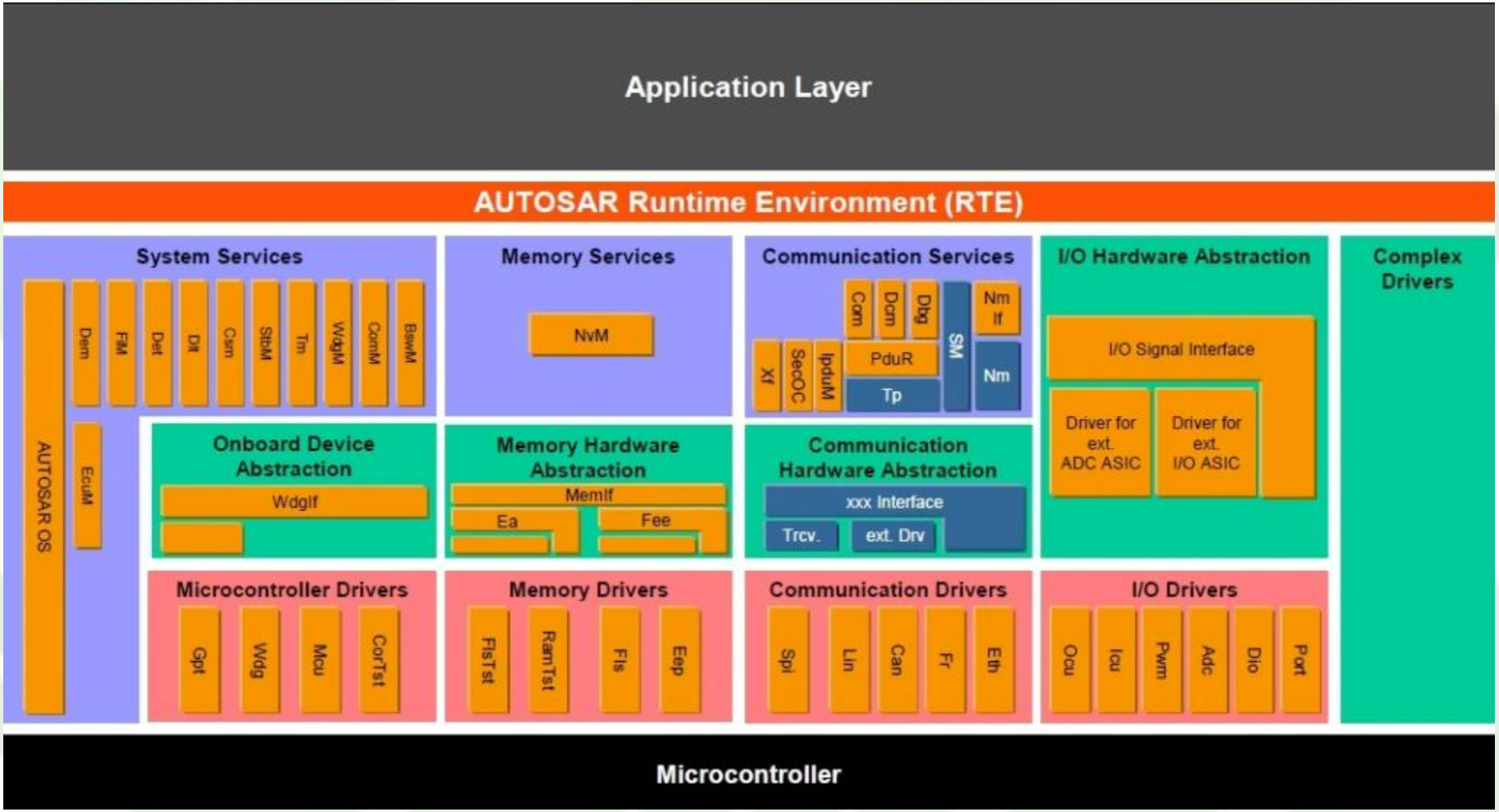
AUTOSAR



AUTOSAR Layered Architecture



AUTOSAR Layered Architecture



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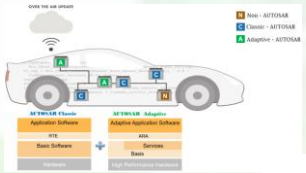
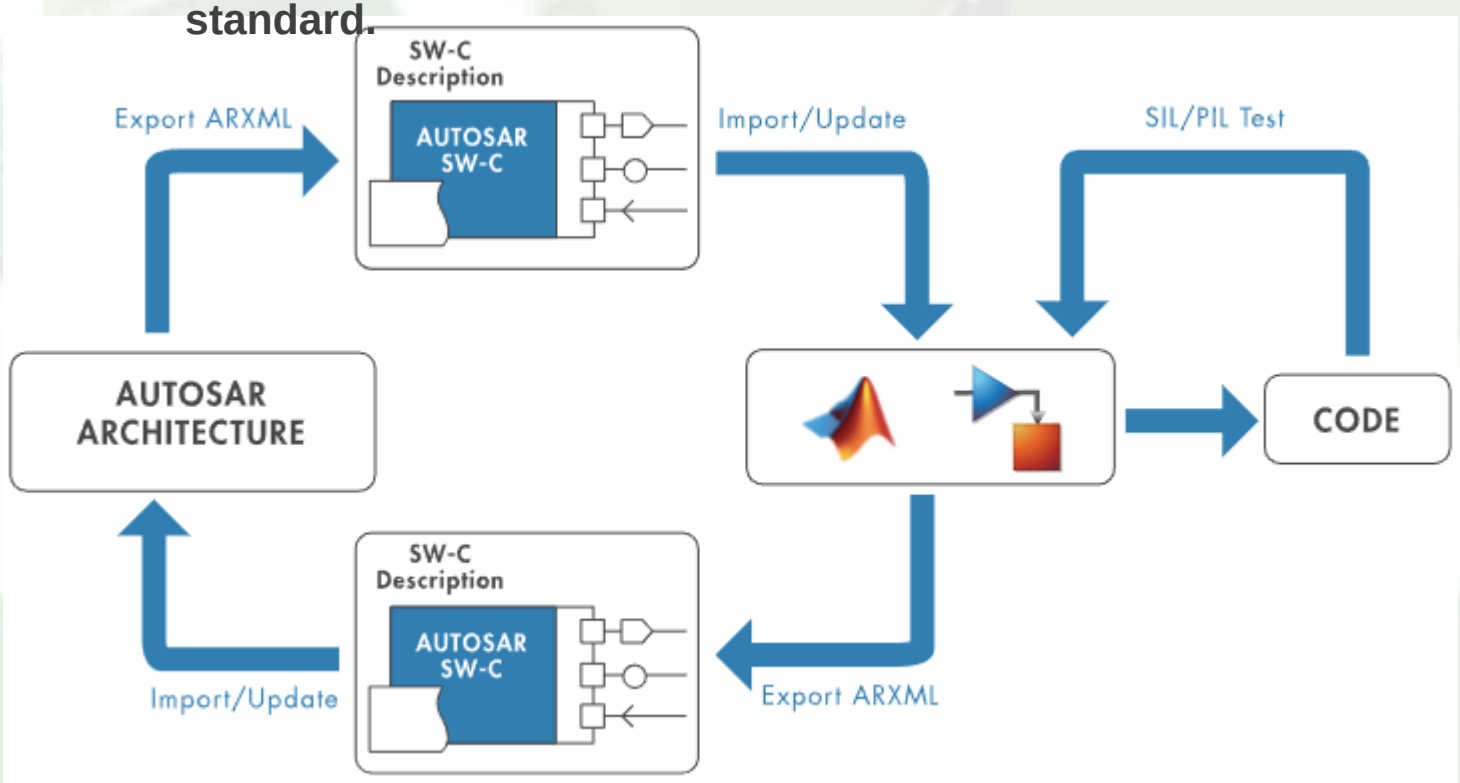
AUTOSAR Blockset

Design and simulate AUTOSAR software

AUTOSAR



Simulink® natively supports the AUTOSAR standard.



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

Automotive Systems and Software Engineering

AUTOSAR - Automotive open system architecture

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AUTOSAR

AUTOSAR Blockset

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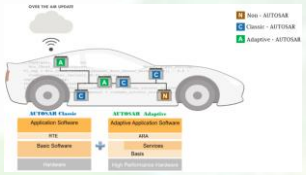

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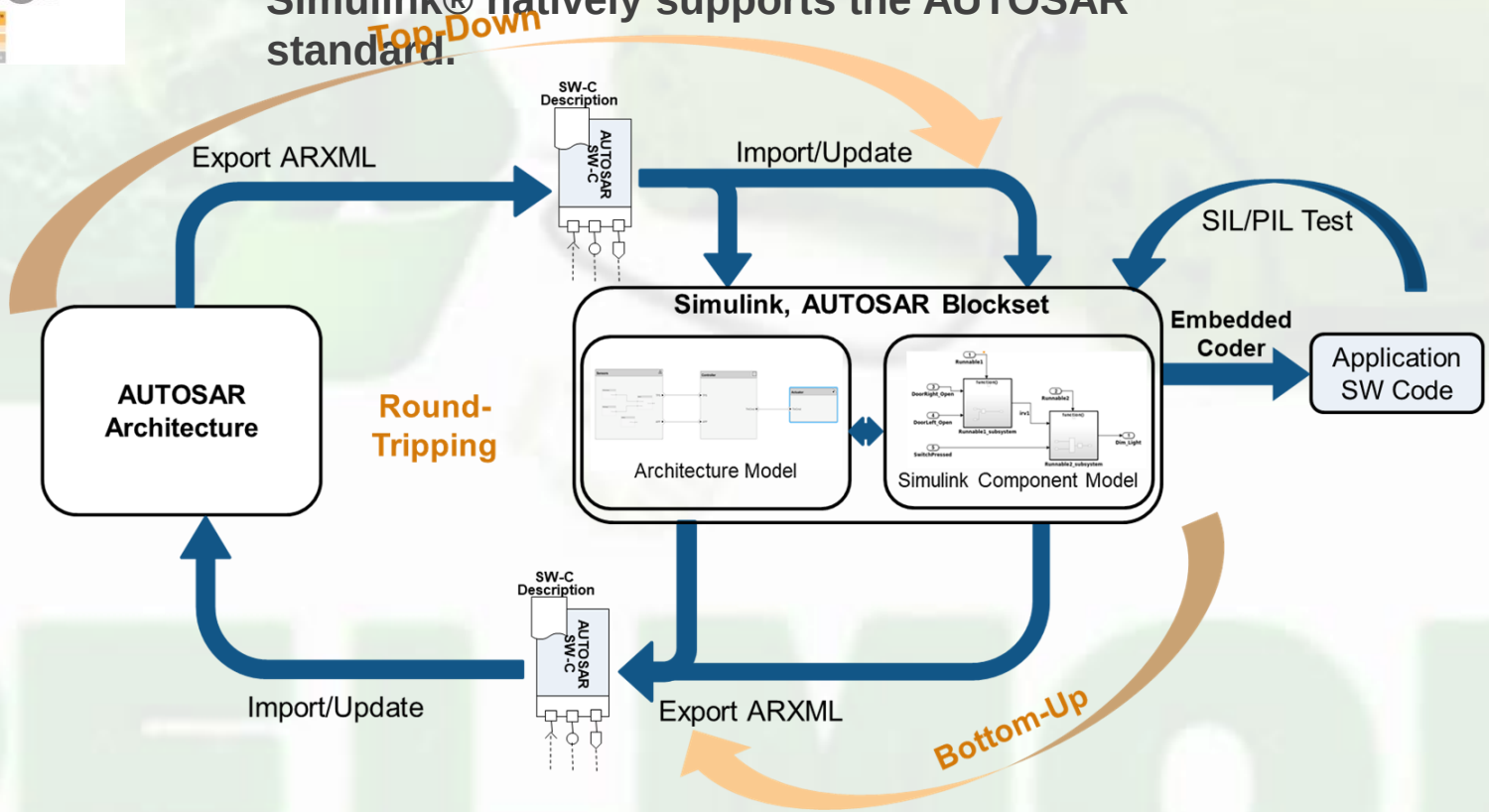

Simulink, AUTOSAR Blockset, and Embedded Coder support round-trip integration with AUTOSAR architectures

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Automotive Systems and Software Engineering

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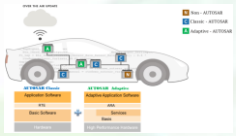
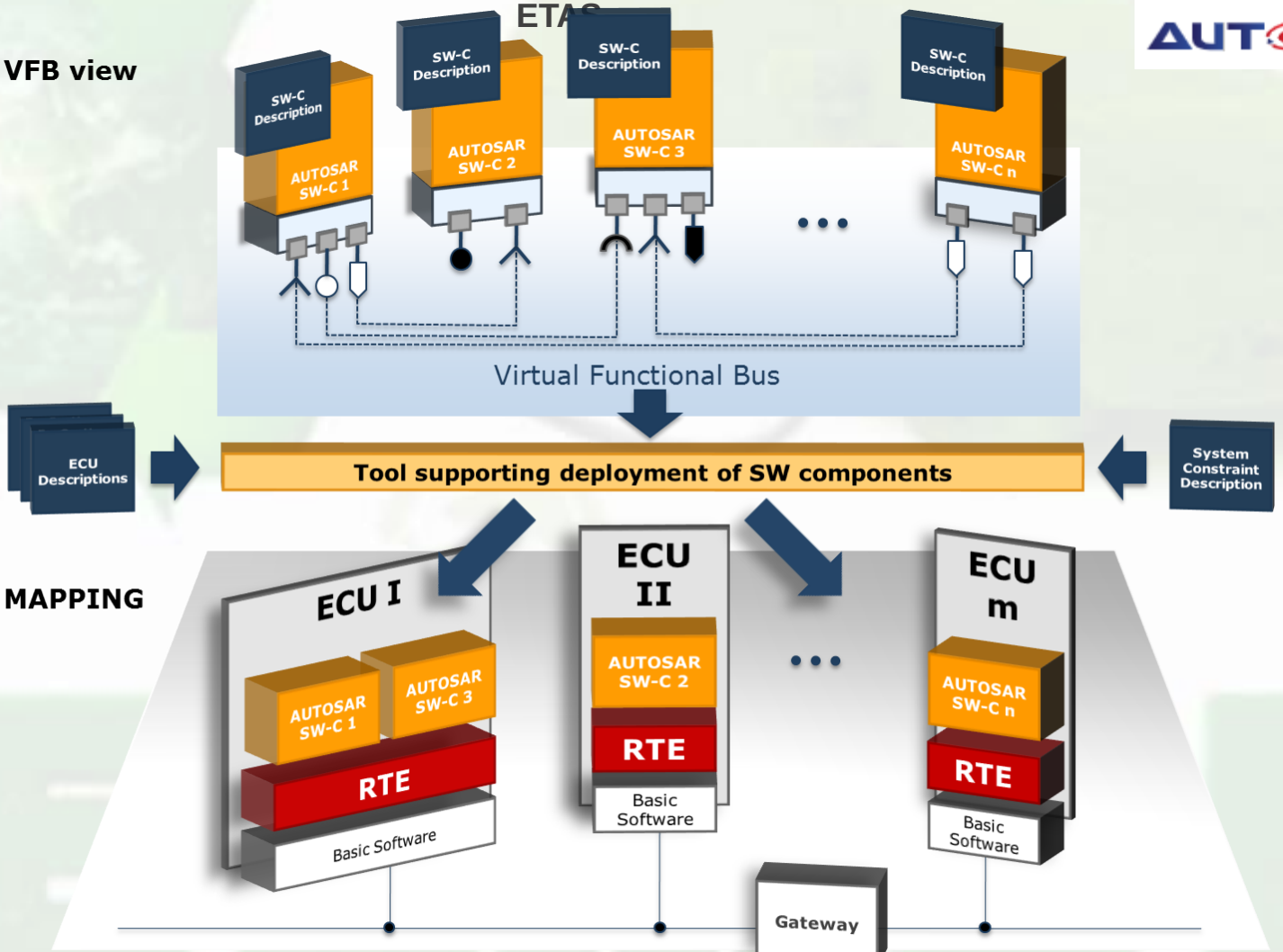
AUTOSAR

AUTOSAR Automotive industry
Computer Software Functional safety
ETAS



VFB view



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.

- **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).