

2024 / 25

School of Science and Computing

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Module Descriptor

Automotive Software Development (Computing and Mathematics)

Automotive Software Development (A11368)

Short Title: Automotive Software Dev.
Department: Computing and Mathematics
Credits: 5

Level: Advanced

Description of Module / Aims

This module introduces the student to the process of production-scale automotive software development, beginning with an overview of vehicle electronic architectures and the automotive software development lifecycle. A detailed technical examination of the AUTOSAR vehicle software architecture is presented and students will learn how to apply this to the development of automotive applications. Model Based Development and testing strategies are explored as a way of improving productivity and software quality. In practical laboratory work students will experience the use of advanced automotive software development and simulation tools.

Programmes

stage/semester/status		
COMP-0567	BSc (Hons) in Applied Computing (WD_KACCM_B)	4 / 7 / E
COMP-0567	BSc (Hons) in Applied Computing (WD_KCOMP_B)	4 / 7 / E
COMP-0567	BSc (Hons) in Computer Science (WD_KCMSC_B)	4 / 7 / E

Indicative Content

- Vehicle electronic architectures
- Automotive software lifecycle
- Automotive software analysis methods and design patterns
- AUTOSAR architecture
- AUTOSAR workflow and tools
- Model Based Development process
- Model specification and code generation tools
- Automotive software testing

Learning Outcomes

On successful completion of this module, a student will be able to:

1. Select how software applications are structured and distributed in an automotive environment.
2. Critique the AUTOSAR software architecture.
3. Integrate industry-standard workflow and tools to develop automotive software.
4. Set-up model based development techniques.
5. Produce test specifications for distributed software functions.
6. Design AUTOSAR standard software components.

Learning and Teaching Methods

- Combination of lectures and lab-based practicals.
- The lectures will cover the theory and underlying technologies in automotive software development.
- The lab-based practicals, building on the theoretical knowledge from the lectures, provide the practical skills to design, simulate and test automotive software applications.
- Students will be encouraged to enhance their lab work and assessment submissions using self-directed research and learning into the broader automotive industry topics and current issues.

Learning Modes

Learning Type	F/T Hours	P/T Hours
Lecture	12	
Practical	36	
Independent Learning	87	

Assessment Methods

	Weighting	Outcomes Assessed
Continuous Assessment	100%	
In-Class Assessment	20%	1,2
Assignment	50%	3,6
Assignment	30%	4,5

Assessment Criteria

<40%: Inability to specify a coherent application design.

40%–49%: Able to describe the basic software development technical concepts.

50%–59%: All the above and in addition is able demonstrate an understanding of the software development using industry tools and workflow.

60%–69%: In addition, is able to develop automotive software components according to the AUTOSAR specification.

70%–100%: All of the above and able to demonstrate a deep understanding of how quality assurance can be incorporated in to the development process.

Essential Material(s)

- "AUTOSAR Organisation." www.autosar.org

Supplementary Material(s)

- Schaeuffele, J and T. Zurawaka. *Automotive Software Engineering*. Stuttgart, Germany.: Springer, 2013.

Requested Resources

- Computer Lab: BYOD Lab