2024 / 25

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Module Descriptor

Automotive Diagnostic Protocols (Computing and Mathematics)

Automotive Diagnostic Protocols (A13585)

Short Title: Auto Diagnostic Protocols
Department: Computing and Mathematics
Credits: 5 **Level:** Advanced

Description of Module / Aims

This module introduces the students to the most commonly used protocols and tools for implementing calibration and diagnostic functions on vehicle and motorsport control systems.

Programmes

		stage/semester/status
COMP-0223	BSc (Hons) in Applied Computing (WD_KACCM_B)	4 / 8 / E
COMP-0223	BSc (Hons) in Applied Computing (WD_KCOMP_B)	4 / 8 / E
COMP-0223	BSc (Hons) in Computer Science (WD_KCMSC_B)	4 / 8 / E
COMP-0223	BSc (Hons) in Physics for Modern Technology (WD_KPHTE_B)	4 / 8 / E

Indicative Content

- Role of diagnostics in the vehicle and application lifecycle
- Vehicle diagnostics interface
- Diagnostic Trouble Codes and ECU Diagnostic memory (Black Box recording)
- Calibration protocol (XCP)
- ASAM diagnostic tool architecture
- Diagnostic protocol (ISO 15765)
- Diagnostic software tools
- Diagnostic data exchange standards

Learning Outcomes

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

1. Design diagnostic services for a vehicle.
2. Evaluate vehicle diagnostic data accessed and processed from suitable software tools.
3. Assess the technical operating principles of common calibration and diagnostic protocols.

Learning and Teaching Methods

- Combination of lectures and lab-based practicals.
- The lectures will cover the theory and underlying technologies in diagnostic application development.
- The lab-based practicals, building on the theoretical knowledge from the lectures, provide the practical skills to develop diagnostic services for automotive applications.
- Students will be encouraged to enhance their lab work and assessment submissions using self-directed research and learning into broader automotive diagnostics topics.

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	25%	3
Assignment	50%	1
Lab Report	25%	2

Assessment Criteria

<40%: Inability to describe the main characteristics of diagnostic protocols.

40%–49%: Able to describe the basic features of diagnostic protocols and tools.

50%–59%: All the above and in addition is able to describe the detailed protocols used for calibration and diagnostic services in automotive applications.

60%–69%: In addition, is able to interpret diagnostic data to identify vehicle application problems.

70%–100%: All of the above and in addition is able to design new diagnostic services.

Essential Material(s)

- "ASAM organisation." www.asam.net

Supplementary Material(s)

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

Requested Resources

- Computer Lab: BYOD Lab