Course guide
820452 - ASAM - Automotive and Vehicle Safety

Last modified: 04/06/2026

Unit in charge: Barcelona East School of Engineering
Teaching unit: 712 - EM - Department of Mechanical Engineering.

Degree: BACHELOR'S DEGREE IN MECHANICAL ENGINEERING (Syllabus 2009). (Optional subject).

Academic year: 2026 **ECTS Credits:** 6.0 **Languages:** Catalan, Spanish

LECTURER

Coordinating lecturer: BENITO JAVIER LUZON NARRO

Others:

Primer quadrimestre:
RUBEN ARROYO GONZALEZ - Grup: T11, Grup: T12
BENITO JAVIER LUZON NARRO - Grup: T11, Grup: T12

Segon quadrimestre:
RUBEN ARROYO GONZALEZ - Grup: T11, Grup: T12
BENITO JAVIER LUZON NARRO - Grup: T11, Grup: T12

DEGREE COMPETENCES TO WHICH THE SUBJECT CONTRIBUTES

Transversal:
1. EFFICIENT ORAL AND WRITTEN COMMUNICATION - Level 3. Communicating clearly and efficiently in oral and written presentations. Adapting to audiences and communication aims by using suitable strategies and means.

TEACHING METHODOLOGY

Theory sessions, individual work, team work and participatory analysis and discussion of concepts or cases will be used.

LEARNING OBJECTIVES OF THE SUBJECT

To introduce the student in the knowledge of the development process of the motor vehicle, the different configurations of vehicles, the systems and elements that make them up and their operation.
It focuses on the key concepts of technology, materials, processes, development objectives and main actors involved in the process, as well as current and future trends.

STUDY LOAD

Type	Hours	Percentage
Self study	90,0	60.00
Hours large group	45,0	30.00
Hours small group	15,0	10.00

Total learning time: 150 h

CONTENTS

UNIT 1: Introduction and General Concepts

Description:
Glossary of automotive terms, basic driveline and body in white configurations, historical overview, product drivers and development process

Full-or-part-time: 24h
Theory classes: 12h
Self study : 12h

UNIT 2: Development of car body, trim and safety systems

Description:
Bodyworks geometries and materials. Passive safety: Crash. Restraint systems and integral security. Aerodynamics

Full-or-part-time: 29h
Theory classes: 12h
Laboratory classes: 5h
Self study : 12h

UNIT 3: Vehicle dynamics

Description:
Traction performance. Acceleration and braking. Steering, tires and suspension systems

Full-or-part-time: 23h
Theory classes: 9h
Laboratory classes: 5h
Self study : 9h

UNIT 4: Powertrain

Description:
Transmission systems. Engine types and driveline configurations

Full-or-part-time: 17h
Theory classes: 6h
Laboratory classes: 5h
Self study : 6h

UNIT 5: Future trends

Description:
Alternative fuel powertrain and electromobility. Megatrends in automotive industry

Full-or-part-time: 12h
Theory classes: 6h
Self study : 6h

GRADING SYSTEM

Any academic fraud, plagiarism or use or possession of unauthorised means in an assessment activity leads to a mark of zero (0) for the affected test or assignment. Furthermore, in accordance with the University's regulations, if disciplinary proceedings are initiated the subject is recorded as "Pending Assessment" until a decision is reached. These incidents are managed in accordance with the **Action Framework for Academic Integrity in Assessment at the UPC**.

BIBLIOGRAPHY

Basic:
- Morello, Lorenzo [et al.]. The Automotive Body [on line]. Dordrecht: Springer Netherlands, 2011 [Consultation: 02/10/2019]. Available on: http://dx.doi.org/10.1007/978-94-007-0513-5. ISBN 9789400705135.
- Reimpell, Jörnsen; Stoll, Helmut; Betzler, Jürgen W.. The Automotive chassis : engineering principles. 2a ed. Warrendale, PA: Society of Automotive Engineers, 2001. ISBN 9780768006575.
- Ehsani, Mehrdad; Gao, Yimin; Emadi, Ali. Modern electric, hybrid electric, and fuel cell vehicles : fundamentals, theory, and design [on line]. 2a ed. Boca Raton: CRC Press, 2010 [Consultation: 15/04/2020]. Available on: https://ebookcentral.proquest.com/lib/upcatalunya-ebooks/detail.action?docID=565872. ISBN 9781420054002.
- Happian-smith, Julian. Introduction to modern vehicle design. Elsevier Science, 2001. ISBN 9780750650441.
- Newton, K.; Steeds, W.; Garrett, T. K.. The Motor vehicle. 12a ed. Warrendale, PA: Society of Automotive Engineers, 1996. ISBN 1560918985.