

## Automotive Technology (E061621)

Due to Covid 19, the education and evaluation methods may vary from the information displayed in the schedules and course details. Any changes will be communicated on Ufora.

<b>Course size</b>	<i>(nominal values; actual values may depend on programme)</i>		
<b>Credits</b> 3.0	<b>Study time</b> 90 h	<b>Contact hrs</b>	30.0 h

### Course offerings and teaching methods in academic year 2022-2023

A (semester 2)	English	Gent	group work	10.0 h
			lecture	20.0 h

### Lecturers in academic year 2022-2023

Demeester, Toon	TW08	lecturer-in-charge
Verhelst, Sebastian	TW08	co-lecturer

### Offered in the following programmes in 2022-2023

	crdts	offering
<a href="#">Bridging Programme Master of Science in Industrial Engineering and Operations Research</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering (main subject Control Engineering and Automation)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering (main subject Electrical Power Engineering)</a>	3	A
<a href="#">Master of Science in Industrial Engineering and Operations Research (main subject Manufacturing and Supply Chain Engineering)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering (main subject Maritime Engineering)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering (main subject Mechanical Construction)</a>	3	A
<a href="#">Master of Science in Electromechanical Engineering (main subject Mechanical Energy Engineering)</a>	3	A
<a href="#">Master of Science in Industrial Engineering and Operations Research (main subject Transport and Mobility Engineering)</a>	3	A
<a href="#">Master of Science in Industrial Engineering and Operations Research</a>	3	A
<a href="#">Master of Science in Sustainable Materials Engineering</a>	3	A

### Teaching languages

English

### Keywords

Road vehicles, traction, powertrain, suspension, steering

### Position of the course

An application of the basic courses which were already lectured (Kinematics and dynamics of mechanisms, Machine parts, Mechanical vibrations, reciprocating machines and internal combustion engines, Turbo machines). The theoretical backgrounds concerning the design of road vehicles are treated. Different designs of vehicle components are shown and explained.

### Contents

- Wheels and tyres: construction, grip, tyre properties, tyre diagrams, identification
- Powertrain: theoretical background, implementation (clutch, manual gear box, automatic gear box, CVT, DCT, driveshaft, final drive)
- Brakes: brake and deceleration diagrams, practical realisation (master cylinder, brake booster, circuit, disc and drum brakes, ABS)
- Vibrations: vibration excitation, assessment criteria, suspension systems (spring and damper systems)
- Steering: vehicle dynamics, practical realisations (steering system, suspension designs)
- Chassis: aerodynamics and safety

### **Initial competences**

Basic notions of kinematics and dynamics, positive displacement machines, internal combustion engines, turbo machinery, machine parts, mechanical vibrations.

### **Final competences**

- 1 Understand the origin of dynamic tyre properties.
- 2 Apply tyre properties to the study of braking stability and vehicle dynamics.
- 3 Explain the course of forces and velocities throughout the powertrain and compare to the requirements for vehicle traction.
- 4 Evaluate the powertrain, braking system, suspension and steering system against the most important criteria.
- 5 First order dimensioning of the powertrain, braking system, suspension and steering system.
- 6 Explain how a choice in the design of a part can influence the operation of other vehicle parts.

### **Conditions for credit contract**

Access to this course unit via a credit contract is determined after successful competences assessment

### **Conditions for exam contract**

This course unit cannot be taken via an exam contract

### **Teaching methods**

Group work, lecture

### **Learning materials and price**

English syllabus, free of charge via the electronic learning environment.

### **References**

### **Course content-related study coaching**

### **Evaluation methods**

end-of-term evaluation and continuous assessment

### **Examination methods in case of periodic evaluation during the first examination period**

Oral examination

### **Examination methods in case of periodic evaluation during the second examination period**

Oral examination

### **Examination methods in case of permanent evaluation**

Report

### **Possibilities of retake in case of permanent evaluation**

examination during the second examination period is possible

### **Extra information on the examination methods**

During examination period: oral closed-book exam, written preparation. During semester: project report.

### **Calculation of the examination mark**

$(\text{project report} * 6 + \text{oral exam} * 14) / 20$