LUNDS UNIVERSITET
Lunds Tekniska Högskola

Course syllabus

Fordonsteknik
Automotive Technology

MVKP55, 7,5 credits, A (Second Cycle)

Valid for: 2023/24
Faculty: Faculty of Engineering, LTH
Decided by: PLED M
Date of Decision: 2023-04-11

General Information

Elective for: M4-tt
Language of instruction: The course will be given in English on demand

Aim

The objective of the course is to provide broad knowledge and fundamental skills within the field of road vehicles, their function and why they are designed as they are.

Learning outcomes

Knowledge and understanding
For a passing grade the student must

- be able to explain the design and functions of the main components of modern road vehicles
- be able to describe the relation between the application and the design of road vehicles and between the user and the vehicle, as well as the vehicle's impact on the environment
- be able to explain on a conceptual level tyre grip, vehicle road-holding & comfort (over/under-steer/bounce/pitch and yaw), crash-dynamics, aerodynamic stability, propulsion & braking performance.

Competences and skills
For a passing grade the student must

- be able to judge and estimate on a conceptual level the impact on vehicle road-holding & comfort (grip/over/under-steer/bounce/pitch/yaw/vibration), crash-dynamics, aerodynamic stability, propulsion and braking performance due to fundamental vehicle design choices.
- be able to analyse, select and design tyres, propulsion systems (engine & transmission), brake systems, spring/damper systems for a given vehicle application, road conditions and driving conditions.

Judgement and approach
For a passing grade the student must

- be able to communicate verbally and in writing with the teachers of the course as well as with the student peers, on relevant matter for the subjects of the course.
- be able to demonstrate written communication skills that are well-structured, learning-oriented and illustrative (applicable reports and other written examination).

Contents

The course deals with road vehicles, such as cars, trucks and buses. First a general description of road vehicles and relevant definitions is given. The historical development is presented. The connection between vehicle properties and the requirements from different users and applications is explained. The course also contains an overview of vehicle safety and environmental issues. The application of fundamental principles, concepts and equations to grip, kinematics and vehicle dynamics through the systems of tyres, suspension, chassis and bodywork; aerodynamics and ergonomics; conventional, electrical and hybrid powertrains, transmissions, drivetrains and braking systems is taught and practically investigated. Autonomous drive and use of augmented reality is presented and demonstrated.

The course contains lectures, exercises, laboratory exercises and projects. Company visits, lectures from industry experts and interaction with the formula student project are all part of the course.

Examination details

Grading scale: TH - (U,3,4,5) - (Fail, Three, Four, Five)
Assessment: Written examination graded with Fail or one of the passing grades 3, 4 or 5 which normally correspond to 50, 65 and 80 % of the maximum number of points respectively. In order to qualify for participation in the written examination all of the mandatory exercises and project must have been completed.

The examiner, in consultation with Disability Support Services, may deviate from the regular form of examination in order to provide a permanently disabled student with a form of examination equivalent to that of a student without a disability.

Admission

The number of participants is limited to: No

Reading list

- Sebastian Verhelst: Automotive Technology.

Contact and other information

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