

Name of module:	Vehicles Technology
Keywords:	Vehicles technology, vehicle and drive train concepts, driving resistance, driving performance
Modulenummer:	ASM 104
Target group(s):	1. Semester ASM
ECTS-Credits:	7
Language of instruction:	English
Module owner:	Prof. Karl-Ludwig Haken

Extent of work (hours)

Workload	Contact hours	Self study	Exam preparation
210	105	75	30

Prerequisites:	<ul style="list-style-type: none"> Fundamentals of Engineering Mechanics
Total target:	<ul style="list-style-type: none"> Understanding of vehicle and drive train concepts and their particular advantages and disadvantages Ability to calculate the driving resistance Ability to read the engine characteristic map and to calculate driving limits
Module content:	<ul style="list-style-type: none"> The course gives a basic knowledge in vehicle technology and internal combustion engine technology Different vehicle concepts like front wheel, rear wheel and 4-wheel-drive will be presented and the concepts will be compared The basic component parts of the chassis and the drive train will be explained Understanding and calculation of Rolling resistance, aerodynamic drag, climbing and acceleration resistance will be learned The relationship between power curve of combustion engines and the force and wheel speed at the driven wheels will be explained and with examples used Different driving limits will be calculated by the use of the resistance forces and the engine power curve and the property of the drive train

Reference material:	<ul style="list-style-type: none"> • Heywood, J.B. Internal Combustion Engine Fundamentals McGraw-Hill, New York 1988 • BOSCH Automotive Handbook 4th edition, 1996 • BOSCH Diesel fuel injection 1st edition 1994
Offered:	Winter term only

Submodules and assessment

Title of submodule	Motor Vehicles
Type of instruction / form of learning:	Lecture
ECTS-Credits:	3
Hours per week:	3
Aims, learning outcomes:	<ul style="list-style-type: none"> • The course gives a basic knowledge in vehicle technology and their components • The power train is mainly focused • The aim is to learn the ability to calculate driving resistance and to design the power train with respect to driving performance and fuel consumption
Type of assessment:	final written examination part I: 60 min

Title of submodule	Lab Motor Vehicles
Type of instruction / form of learning:	Laboratory
ECTS-Credits:	1
Hours per week:	1
Aims, learning outcomes:	<ul style="list-style-type: none"> • Determination of full-load torque and power pattern by using the car test bench • Detection of fuel consumption map • Determination of a tyre map by using the tyre test bench EUREPA. • Analysis of vehicle road tests
Type of assessment:	Lab report

Title of submodule	Internal Combustion Engines
Type of instruction / form of learning:	Lecture
ECTS-Credits:	3
Hours per week:	3
Aims, learning outcomes:	<ul style="list-style-type: none">• Internal Combustion Engine Fundamentals: Mechanics, Design, Kinematics, Thermodynamics,• Gas Exchange, Mixture Preparation, Combustion, Emissions• New Technologies, Developments and Trends of the Drive Train• Advanced Knowledge in the fields of Engine Management, Turbo Charging and• Direct Injection
Type of assessment:	final written examination part II: 60 min