Technik
Hauptcampus

HOCHSCHULE TRIER

Module manual for the course Master Interdisciplinary Engineering

Examination regulations 2021

Version 01.00.SoSe2025

24.03.2025

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Abbreviations

BM	Basic module
CEM	Compulsatory elective module
RM	Required module

Explanations

Basic module	In the Master's degree programme in Electrical Engineering, basic modules must be selected and completed in accordance with the respective examination or subject examination regulations.
Compulsatory elective module	Depending on the degree programme, examinations must be taken in one or more compulsory elective modules. The compulsory elective modules must be selected from the current catalogue of compulsory elective modules.
Required module	Compulsory elective modules must be successfully completed to obtain a degree in a degree programme.

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General notes

- The timing of the modules can be found in the annexes of the examination regulations or the subject examination regulations.
- The overall grade is calculated in accordance with the examination regulations or subject examination regulations.
- If several alternative exam performances, depending on the number of participants, are specified for a module, the current exam performance for the semester will be announced at the beginning of the course. These are indicated by additions in brackets with reference to the number of participants. In all other cases in which several exam performances are specified for a module, these must be taken in order to successfully pass the module.
- The requirement for the awarding of ECTS credits is the successful completion of the listed exam and study performances. If a module consists of two courses (e.g. a laboratory with the courses Partial Laboratory 1 and Partial Laboratory 2), the ECTS credits shown in the respective courses are not awarded individually, but the sum of the ECTS credits of the associated courses is only awarded when the complete module is passed.
- The examination regulations or subject examination regulations in the currently valid version are legally binding.

Modulliste Kerndisziplin und ergänzende Disziplin im Studiengang Master Interdisziplinäre Ingenieurwissenschaften (Stand: 03/2025)

Modulname in deutscher Sprache	module name in english	Lehrsprache D=Deutsch Teaching language D=German	gewählte Vertiefung/Kerndisziplin area of specialisation/core discipline						Semesteran gabe Semester	Fachbereich Fachrichtung Department	Studienleist-ung Prüfungsvor-leistung Study performance	Modulverantwortlicher Responsible for the module
Deutsch German	Englisch English	Lehrsprache E=Englisch Teaching language E=english	ET	MB	GVE	WI	MT	FZT	Semester WS/SS	FB FR Department	Studienleistung (SL) Prüfungsvorleistung (PVL) keine none	Name Name
Powersystems	Powersystems-E	D	K	E	E	E	E	E	WS	ET	keine	Brechtken
Statistik MB	Statistics MB (M)	D	E	E	E	K	E	E	WS	MB	keine	Bär
Unternehmensökonomik	Operations Research (M)	D	E	E	E	K	E	E	WS	MB	keine	Kirsten
Qualität u.Zuverlässigkeit I	Quality and Reliability I (M)	D	E	E	E	K	E	E	SS	MB	keine	Bär
Qualität und Zuverlässigkeit II	Quality and Reliability II (M)	D	E	E	E	K	E	E	SS	MB	keine	Bär
Höh. Maschinenelemente	Higher Machine Elements (M)	D	E	K	E	E	E	E	SS	MB	2 SL	Bossong
Netzintegration Erneuerbarer Energien	Electrical Grid Integration of Renewable Energies	D	E	E	K	E	E	E	WS	GVE	keine	Bühler
German as foreign language	German as foreign language	D	K	K	K	K	K	K	SS and WS	ET	keine	Feili
Elektromagnetische Felder	Electromagnetic fields	D	K	E	E	E	E	E	SS	ET	keine	Diewald
Wasserstofftechnik	Hydrogen technology	D	E	E	K	E	E	E	SS	GVE	keine	Döring
Gastechnik III (H2, Planung , Bau, Betrieb, intelligente Gasnetze)	Gas technology III	D	E	E	K	E	E	E	WS	GVE		Döring
Entrepreneurship	Entrepreneurship	E	E	E	E	K	E	E	SS	FB-TECH	keine	Horn
Wirtschaftspsychologie	Business Psychology (M)	D	E	E	E	K	E	E	WS	MB	keine	Draack
Medizinische Systeme 1	Medical systems 1	D	K	E	E	E	K	E	SS	ET	keine	Feili
Lernende Systeme	Learning Systems	E	K	E	E	E	K	K	WS	ET	keine	Haffner
Thermodynamik	Thermodynamics (M)	D	E	K	E	E	E	E	SS	MB	keine	Heinrich
Verbrennungsmotoren I	Internal combustion engines I (M)	D	E	K	E	E	E	E	WS	MB	keine	Heinrich

Verbrennungsmotoren II	Internal combustion engines II (M)	D	E	K	E	E	E	E	**SS**	**MB**	**keine**	**Heinrich**
Wissenschaftliche Methodik	Scientific methodology (M)	D	K	K	K	K	K	K	**WS**	**MB**	**keine**	**Heinrich**
Gebäude- und Anlagensimulation	Building and Plant Simulation	D	E	E	K	E	E	E	**WS**	**GVE**		**Jonas**
Medizinische Systeme 2	Medical systems 2	D und E/D and E	K	E	E	E	K	E	**WS**	**ET**	**keine**	**Koch**
Electronic Engine Management Systems	Electronic Engine Managment Systems	E	E	K	E	E	E	K	**SS**	**extern**	**keine**	**König, Jaikumar, HITS**
Vehicle Dynamics	Veicle Dynamics	E	E	K	E	E	E	K	**SS**	**extern**	**keine**	**König, Ramanthan, HITS**
Fahrzeugsicherheit	Vehicle Safety	D und E/D and E	E	K	E	E	E	K	**WS**	**MB**	**PVL**	**König, P.**
Internation. Management	International management (M)	D und E/D and E	E	E	E	K	E	E	**WS**	**MB**	**keine**	**Draack**
Strömungslehre (M)	Fluid mechanics (M)	D	E	K	E	E	E	E	**SS**	**MB**	**keine**	**König, S.**
Turbomaschinen (M)	Turbomachinery (M)	E	E	K	E	E	E	K	**WS**	**MB**	**keine**	**König, S.**
Advanced Cognitive Robotics	Advanced Cognitive Robotics	E	K	E	E	E	E	E	**SS or WS**	**ET**	**keine**	**Lücken**
Energie- und Klimamanagement	Energy and Climate Management	D	E	E	K	E	E	E	**SS**	**GVE**	**keine**	**Neumeister**
Simulation und Optimierung von Kraftwerken	Simulation and optimization of power plants	D	E	E	K	E	E	E	**SS**	**GVE**	**keine**	**Neumeister**
Energieeffizienz in der Industrie II	Energy efficiency in industry II	D	E	E	K	E	E	E	**WS**	**GVE**	**keine**	**Neumeister**
Energieeffizienz in der Industrie I	Energy efficiency in industry I	D	E	E	K	E	E	E	**SS**	**GVE**		**Neumeister**
Biomechanical Systems	Biomechanical Systems	D und E/D and E	E	E	E	E	K	E	**SS**	**ET**	**keine**	**Nolle**
International Marketing	International Marketing	E	E	E	E	K	E	E	**SS**	**W**	**keine**	**Richter**
Abgasreinigung und Energieeffizienz	Emission Control and Energy Efficiency	D	E	E	K	E	E	E	**WS**	**GVE**	**keine**	**Reindorf**
Programmierung von ERP-Systemen am Beispiel von SAP	Programming of ERP systems using SAP	D und E/D and E	E	E	E	K	E	E	**SS**	**MB**	**SL**	**Rudolph**
Regelungstechnik	Automatic Control	D	K	E	E	E	E	E	**WS**	**ET**	**keine**	**Scherer**
Modellbasierte optimale Zustandsschätzung	Model-Based Optimal Estimation	D und E/D and E	K	E	E	E	E	E	**SS**	**ET**	**keine**	**Scherer**
CAE/Projektmanagement I (M)	CAE/Project Management I (M)	D	E	K	E	E	E	E	**SS**	**MB**	**PVL**	**Schuth**
CAE/Projektmanagement II (M)	CAE/Project Management II (M)	D	E	K	E	E	E	E	**WS**	**MB**	**keine**	**Schuth**
Optische Messtechnik (M)	Optical metrology (M)	E	E	K	E	E	E	K	**SS**	**MB**	**keine**	**Schuth**
Technisches Messen	Technical measurement (M)	D	E	K	E	E	E	E	**WS**	**MB**	**keine**	**Schuth**
Singalverarbeitung	Digital Signal Processing	D	K	E	E	E	E	E	**SS**	**ET**	**keine**	**Seidenberg**
Wirtschaftsprivatrecht	Private BusinessLaw / Business Private Law	D	E	E	E	K	E	E	**SS**	**GVE**	**keine**	**Strotmann**
German Accounting	German Accounting	E	E	E	E	K	E	E	**SS**	**MB**	**keine**	**Kirsten**

Wettbewerb u. Innovation	Competition and Innovation (M)	D	E	E	E	K	E	E	**SS**	**MB**	**keine**	**Draack/Kirsten**
Asset Management von Wassernetzen	Asset Management of Water Supply Networks	D	E	E	K	E	E	E	**WS**	**GVE**	**keine**	**Wilhelm**
Fertigungstechnik (M)	Production engineering (M)	D	E	K	E	E	E	E	**WS**	**MB**	**PVL**	**Wittmann**
Finite Elemente Methode (M)	Finite elements method (M)	D	E	K	E	E	E	K	**SS**	**MB**	**keine**	**Wohlers**
Schwingungstechnik (M)	Vibration engineering (M)	D	E	K	E	E	E	E	**WS**	**MB**	**keine**	**Wohlers**
Mathematik	Mathematics (M)	D	E	K	E	E	E	E	**WS**	**MB**	**keine**	**Zimmermann**
Numerische Mathematik	Numerical mathematics (M)	D	E	K	E	E	E	E	**WS**	**MB**	**keine**	**Zimmermann**
Systemtechnik (M)	Systems engineering (M)	D	E	K	E	E	E	E	**SS**	**MB**	**keine**	**Zimmermann**
Energieeffi. Fahrzeuge	Energy-efficient vehicles (M)	D	E	K	E	E	E	E	**SS**	**MB**	**keine**	**Dräger**
Fahrzeugantriebe u. Fahrwerke (M)	Vehicle Drives and Chassis (M)	D	E	K	E	E	E	E	**WS**	**MB**	**keine**	**Dräger**
Verkehrssysteme (M)	Transportation systems (M)	D	E	K	E	E	E	E	**WS**	**MB**	**keine**	**Dräger**
Auslandssemester: Modulangebot der UNIWA (Athen):												
	The Science of Biomedical Engineering	E					E		**WS**	**extern**		**UNIWA, Athens, Greece**
	Research Methodology	E					E		**WS**	**extern**		**UNIWA, Athens, Greece**
	Biology-Biotechnology	E					K		**WS**	**extern**		**UNIWA, Athens, Greece**
	The Biomedical Engineering Industry Sector I	E					K		**WS**	**extern**		**UNIWA, Athens, Greece**
	Biostatistics	E					K		**WS**	**extern**		**UNIWA, Athens, Greece**
	Medical Signal and Image Processing	E					K		**WS**	**extern**		**UNIWA, Athens, Greece**
	Biomedical Marketing	E					E		**WS**	**extern**		**UNIWA, Athens, Greece**
	Quality Assurance and Medical Device Regulations	E					E		**WS**	**extern**		**UNIWA, Athens, Greece**
	Biomechanics and Biomaterials	E					K		**WS**	**extern**		**UNIWA, Athens, Greece**
	Optical Microscopy	E					E		**WS**	**extern**		**UNIWA, Athens, Greece**
	Diagnostic Medical Imaging Systems	E					K		**SS**	**extern**		**UNIWA, Athens, Greece**
	Biomedical Instrumentation	E					K		**SS**	**extern**		**UNIWA, Athens, Greece**
	The Biomedical Engineering Industry Sector II	E					K		**SS**	**extern**		**UNIWA, Athens, Greece**
	Emergency Medicine	E					K		**SS**	**extern**		**UNIWA, Athens, Greece**
	Control Systems in Biomedical Engineering	E					K		**SS**	**extern**		**UNIWA, Athens, Greece**
	Bioinformatics	E					K		**SS**	**extern**		**UNIWA, Athens, Greece**

	Human Machine Interaction in Healthcare	E					K		**SS**	**extern**		**UNIWA, Athens, Greece**
	Machine Learning in Medicine and Biology	E					K		**SS**	**extern**		**UNIWA, Athens, Greece**
	Science, Technology, Society: Biomedical Engineering, Social Aspects, Ethics	E					E		**SS**	**extern**		**UNIWA, Athens, Greece**
Abkürzungen und Bedeutungen:		**Abbreviations and meanings:**										
GVE	**Gebäude-, Versorgungs- und Engergietechnik**	**Technical building services, Supply Systems and Energy Technology**	https://www.hochschule-trier.de/hauptcampus/bauen-plus-leben/gve/studium/studiengaenge/energiemanagement-meng				**K = Kerndisziplin**	**core discipline**		**Studien-leistung (SL)**	**study performance**	
ET	**Elektrotechnik**	**Electrical Engineering**	https://www.hochschule-trier.de/hauptcampus/technik/studium/master-sg-technik/etmsc				**E = ergänzende Disziplin**	**comple-mentary discipline**		**Prüfungs vorleist ung(PVL)**	**prerequisite for admission to exam performance**	
WI	**Wirtschaftsingenieur**	**Industrial Engineering**	https://www.hochschule-trier.de/hauptcampus/technik/studium/master-sg-technik/wimeng									
MB	**Maschinenbau**	**Mechanical Engineering**	https://www.hochschule-trier.de/hauptcampus/technik/studium/master-sg-technik/mbmeng				**UNIWA, Athens, Greece**			https://bmet.uniwa.gr/courses-2/1st-semester/		
MT	**Medizintechnik**	**Medical Engineering**	https://www.hochschule-trier.de/hauptcampus/technik/studium/master-sg-technik/etmsc				**UNIWA, Athens, Greece**			https://bmet.uniwa.gr/courses-2/2nd-semester/		
FZT	**Fahrzeugtechnik**	**Automotive Technology**	https://www.hochschule-trier.de/hauptcampus/technik/studium/master-sg-technik/mbmeng				**UNIWA, Athens, Greece**			https://bmet.uniwa.gr/courses-2/3rd-semester/		

Contents

Advanced Cognitive Robotics			
Content	Lecture: - Basic concepts of Industry 4.0, Cyber-Physical Systems (CPS) and robotics - Fundamentals of mobile robotics, Kinematics and actuators - Introduction to the Robot Operating System (ROS) framework - Perception: sensor technology, sensor data processing and fusion; environment perception - Localization and mapping, motion planning and navigation The lecture topics are accompanied by complementary practical applications as laboratory exercises. These will be implemented using Python and ROS.		
Competency goals	Upon successful completion of the module, students will be able to, 1. Identify application fields of the Industry 4.0 and robotics, 2. Describe the basic components, functionalities and interactions of mobile robotics, 3. use the acquired knowledge to gain an understanding of complex systems in mobile robotics and sensing/perception, 4. develop practical applications of robotics in the lab.		
Teaching form	☒ Lecture		
	☐ Exercise		
	☐ Seminar/seminar exercise		
	☒ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature	• Further literature will be announced in lecture • Klein, B. Einfuhrung in Python 3. Hanser Verlag, 2021 (optionally, to refresh Python knowledge). • Thrun; Burgard; Fox. Probabilistic Robotics. MIT Press, 2005. • Siciliano, Khatib. Springer Handbook of Robotics - Second Edition. Springer, 2016 (available on demand in case of further interest) • Siegwart; Nourbakhsh, Scaramuzza. Introduction to Autonomous, Mobile Robots - Second Edition. MIT Press, 2011. • Quigley; Gerkey; Smart. Programming Robots with ROS. O Reilly, 2015. • Thrun; Burgard; Fox. Probabilistic Robotics. MIT Press, 2005. • Siciliano, Khatib. Springer Handbook of Robotics - Second Edition. Springer, 2016 (available on demand in case of further interest) • Siegwart; Nourbakhsh, Scaramuzza. Introduction to Autonomous, Mobile Robots - Second Edition. MIT Press, 2011. • Quigley; Gerkey; Smart. Programming Robots with ROS. O Reilly, 2015.		
Study performance	☐ Exercise performance		
	☒ Laboratory performance		
	☐ Term paper		
	☐ Presentation		
	☐ Certificate		
Exam performance	☒ Written exam (in case of high number of participants)		
	☒ Oral exam (in case of low number of participants)		
	☐ Term paper		
	☐ Project paper		
	☒ Laboratory performance		
	☐ Final thesis and oral exam		
	☐ presentation		
Usability	Master Electrical Engineering (-Cooperative Study Programme) - (FPO 2025)	☒ BM	
	Master Electrical Engineering - (PO 2019)	☒ BM	
	Master Interdisciplinary Engineering - (PO 2021)	☒ CEM	
Offer	☐ Winter semester ☐ Summer semester ☒ Irregular		
Workload	Credit points	Contact time	Self-study
	5	60 hours [4 hours per week]	90 hours

Language	English
Duration of the module	1 Semester
Approved aids for the exam performance	Will be announced in the lecture
Lecturer(s)	Mr. Prof. Dr. Volker Lücken
Responsible(s)	Mr. Prof. Dr. Volker Lücken
Comment	Fundamental prior knowledge of software development with Python is mandatory. The successful participation in the lab sessions is required. This course is the successor of Industrie 4.0 & IoT / Industry 4.0 & IoT. Please note that the course is seat restricted and requires registration in the first week, with a priorization of Electrical Engineering (M.Sc.) students, and also the EE specialization of Interdisciplinary Engineering (M.Sc.).
Change date	12.03.2025

Electronic Engine Management Systems			
Content	CHAPTER I: FUNDAMENTALS OF AUTOMOTIVE ELECTRONICS Microprocessor architecture, open and closed loop control strategies, PID control, Look up tables, introduction to modern control strategies like Fuzzy logic and adaptive control. A/D and D/ A controllers. CHAPTER II: SENSORS Types - Mass Air flow, Manifold Absolute Pressure, Temperature, Speed, EGO, Knock, and Crankshaft Position-Hall Effect-Principle of operation, construction, material and characteristics. CHAPTER III: SI ENGINE MANAGEMENT Mono point, Multi point and Direct injection systems - Principles and Features, Bosch injection systems- L-Jetronic and LH -Jetronic- Layout and working, Open loop control and Lambda loop control in injection. CHAPTER IV: CI ENGINE MANAGEMENT Fuel injection system parameters affecting combustion, noise and emissions in CI engines. Inline injection pump, Rotary pump and injector - Construction and principle of operation, Electronically controlled Unit Injection system. Layout of the common rail fuel injection system. CHAPTER V: IGNITION SYSTEMS AND ENGi NE MAPPING Ignition fundamentals, Types of solid-state ignition systems, High energy ignition distributors, Electronic spark timing and control. Combined ignition and fuel management systems. Digital control techniques - Dwell angle, Ignition timing and Injection duration calculation.		
Competency goals	Familiarize with automotive instruments and sensors Gain knowledge about the measurement of engine parameters by using sensors Attain knowledge on the working of Electronic Ignition System Attain the Principles of Digital Control systems and its applications Familiarize with the concept of Engine mapping		
Teaching form	☒ Lecture		
	☐ Exercise		
	☐ Seminar/seminar exercise		
	☐ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature			
Study performance	☐ Exercise performance		
	☐ Laboratory performance		
	☐ Term paper		
	☐ Presentation		
	☐ Certificate		
Exam performance	☒ Written exam		
	☐ Oral exam		
	☐ Term paper		
	☐ Project paper		
	☐ Laboratory performance		
	☐ Final thesis and oral exam		
	☐ presentation		
Usability	Master Interdisciplinary Engineering - (PO 2021)		☒ CEM
Offer	☒ Winter semester ☐ Summer semester ☐ Irregular		
Workload	Credit points: 5	Contact time: 60 hours [4 hours per week]	Self-study: 90 hours
Language	English		
Duration of the module	1 Semester		
Approved aids for the exam performance	None		
Lecturer(s)	Mr. Prof. Dr. M. Jaikumar		
Responsible(s)	Mr. Prof. Dr.-Ing. Peter König		

Comment	pure online module
Change date	29.11.2024

Entrepreneurship			
Content			
Competency goals			
Teaching form	☒ Lecture		
	☐ Exercise		
	☐ Seminar/seminar exercise		
	☐ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature			
Study performance	☐ Exercise performance		
	☐ Laboratory performance		
	☐ Term paper		
	☐ Presentation		
	☐ Certificate		
Exam performance	☒ Written exam		
	☐ Oral exam		
	☐ Term paper		
	☐ Project paper		
	☐ Laboratory performance		
	☐ Final thesis and oral exam		
	☐ presentation		
Usability	Master Interdisciplinary Engineering - (PO 2021)		☒ CEM
Offer	☐ Winter semester ☒ Summer semester ☐ Irregular		
Workload	Credit points	Contact time	Self-study
	5	60 hours [4 hours per week]	90 hours
Language	English		
Duration of the module	1 Semester		
Approved aids for the exam performance	Will be announced in the lecture		
Lecturer(s)	Mr. Dieter Horn		
Responsible(s)	Mr. Prof. Dr. Elmar Seidenberg		
Comment	Core discipline WI		
Change date	24.03.2025		

German Accounting			
Content	- Statutory regulations on the keeping of of books and the preparation of the annual financial statements - Principles of proper bookkeeping and accounting - Fundamentals of accounting technique and double-entry bookkeeping - Accounting treatment of business transactions in commercial, financial and industrial enterprises - Accounting entries for preparing the annual financial statements (balance sheet and profit and loss account)		
Competency goals	After successful participation, students - understand the main principles and rules; - can apply these principles and rules; - understand the mapping of economic decisions in financial accounting and are familiar with the techniques of double-entry bookkeeping - can explain the difference between business transactions that do not affect profit or loss and those that do, and can book the corresponding business transactions; and - have an understanding of various accounting problems.		
Teaching form	☒ Lecture		
	☐ Exercise		
	☐ Seminar/seminar exercise		
	☐ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature	• Brösel, Gerrit/Freichel, Christoph/Mindermann Torsten: German Accounting - A Guide for Students and Professionals, Berlin - ESV, 2022 (2nd, revised and updated edition) • Nothelfer, Robert: Financial Accounting, Introduction to German GAAP with exercises, 2017.		
Study performance	☐ Exercise performance		
	☐ Laboratory performance		
	☐ Term paper		
	☐ Presentation		
	☐ Certificate		
Exam performance	☒ Written exam		
	☐ Oral exam		
	☐ Term paper		
	☐ Project paper		
	☐ Laboratory performance		
	☐ Final thesis and oral exam		
	☐ presentation		
Usability	Master Interdisciplinary Engineering - (PO 2021)	☒ CEM	
Offer	☐ Winter semester ☒ Summer semester ☐ Irregular		
Workload	Credit points: 5	Contact time: 60 hours [4 hours per week]	Self-study: 90 hours
Language	English		
Duration of the module	1 Semester		
Approved aids for the exam performance	Calculator (not programmable)		
Lecturer(s)	Mr. Prof. Dr. Björn Kirsten		
Responsible(s)	Mr. Prof. Dr. Björn Kirsten		
Comment	module core discipline industrial engineering		
Change date	16.03.2025		

German as Foreign Language			
Content			
Competency goals	The course is aimed at acquiring and developing written and oral communication skills and is guided by the requirements of the Common European Framework of Reference for Languages (CEFR). We will listen to audio texts introducing various new word ˙elds, structures and idioms based on the authentic reading. Students will practice their oral and written communication skills in simple everyday situations as well as reading and listening to texts on topics related to everyday life. In addition, comprehension strategies are practiced. We will talk a lot, but of course we will also practice grammar. Writing and listening are also part of language acquisition.		
Teaching form	☒ Lecture		
	☒ Exercise		
	☐ Seminar/seminar exercise		
	☐ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature	• wird in der Veranstaltung bekanntgegeben		
Study performance	☐ Exercise performance		
	☐ Laboratory performance		
	☐ Term paper		
	☐ Presentation		
	☐ Certificate		
Exam performance	☒ Written exam		
	☐ Oral exam		
	☐ Term paper		
	☐ Project paper		
	☐ Laboratory performance		
	☐ Final thesis and oral exam		
	☐ presentation		
Usability	Master Interdisciplinary Engineering - (PO 2021)		☒ CEM
Offer	☒ Winter semester ☒ Summer semester ☐ Irregular		
Workload	Credit points	Contact time	Self-study
	5	60 hours [4 hours per week]	90 hours
Language	German		
Duration of the module	1 Semester		
Approved aids for the exam performance	None		
Lecturer(s)	N. N.		
Responsible(s)	Mr. Prof. Dr.-Ing. Dara Feili		
Comment	The lecture can only be recognized once as a compulsory elective module in accordance with the examination regulations. A maximum of 5 ECTS credits can be earned. The prerequisite for the awarding of ECTS points is the successful completion of the listed exam and study performances. Prerequisite for taking the exam performance: Attendance is compulsory; a maximum of three absences will be tolerated. Module for all core disciplines		
Change date	28.11.2024		

International Marketing			
Content	Decisions whether to internationalize Decisions which markets to enter: global marketing research Decisions which markets to enter: market selection process Decisions in t erms of market entry strategies: intermediate modes Decisions in terms of market entry strategies: hierarchical modes Decisions with regard to the global marketing mix: product issues Decisions with regard to the global marketing mix: promotion issues Decisions with regard to the global marketing mix: price issues Decisions with regard to the global marketing mix: distribution issues Decisions with regard to implementing and coordinat ing: organization Decisions with regard to implementing and coordinat ing: negotiations Decisions with regard to implementing and coordinat ing: control		
Competency goals	Students know basic elements of international marketing with practical relevance for decision making in international and global market environments. Students can apply these concepts for the solution of examples of international marketing. Students can translate international marketing into major conceptual building blocks [e.g. strategic versus tactical decision -making in global marketing), can come up with adequate market evaluations and find decent solutions for particular target markets and world regions. Students have successfully applied self-contained learning strategies and have maintained motivation to achieve results.		
Teaching form	☒ Lecture		
	☐ Exercise		
	☐ Seminar/seminar exercise		
	☐ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature	• Keegan, W. & Green, M. [latest ed): Global Marketing. Harlow: Prentice Hall.		
Study performance	☐ Exercise performance		
	☐ Laboratory performance		
	☐ Term paper		
	☐ Presentation		
	☐ Certificate		
Exam performance	☒ Written exam		
	☐ Oral exam		
	☐ Term paper		
	☐ Project paper		
	☐ Laboratory performance		
	☐ Final thesis and oral exam		
	☐ presentation		
Usability	Master Interdisciplinary Engineering - (PO 2021)	☒ CEM	
Offer	☐ Winter semester ☒ Summer semester ☐ Irregular		
Workload	Credit points: 5	Contact time: 60 hours [4 hours per week]	Self-study: 90 hours
Language	English		
Duration of the module	1 Semester		
Approved aids for the exam performance	None		
Lecturer(s)	N. N.		
Responsible(s)	Mr. Prof. Dr. Elmar Seidenberg		
Comment	Module for core discipline industrial engineering		
Change date	06.03.2025		

Machine Tools and Production Lines I (M)			
Content	Please note: The language of this lecture is German, no English translation will be provided! The language of the exam for this lecture is also German, all your answers must also be given in German! If you are not able to follow the lecture in German at Master level, please choose another lecture which is held in English. - Introduction to machine tools and production equipment - Frames, frame components, foundations - Geometric and thermal machine behavior - Slideways and plain bearings, hydrostatic, hydrodynamic and aerostatic plain bearings, magnetic bearings - Rolling guides and bearings, spindle bearing systems, seals, covers - Motors, feed drives - Gearboxes for machine tools and production equipment - Equipment and components of machine tools - Clamping of workpieces and clamping devices for machine tools - Machine acceptance, measurement and protective devices on machine tools - Noise behavior of machine tools and production equipment - Coordinate systems - Cutting machine tools with geometrically determined cutting edge: Fräsen		
Competency goals	After successful completion of the module, students will be able - to describe the boundary conditions for the use of machine tools in the industrial environment. - recognize and compare the design, construction and basic types of machine tools. - derive the requirements for machine tools according to the situation. - Discuss basic machine tool types and basic production equipment types and evaluate them according to their intended use. - Select suitable machine tools for solving a manufacturing task. - Evaluate the use of machine tools and production equipment in the modern manufacturing process. - the use of machine tools and production equipment in production the following table shows the results of the evaluation and transfe to similar systems.		
Teaching form	☒ Lecture		
	☐ Exercise		
	☐ Seminar/seminar exercise		
	☐ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature	• Vorlesungsunterlagen, Skript • Literaturempfehlung: Weck/Brecher, ”Werkzeugmaschinen”, Band 1-5 (in der Bibliothek mehrfach vorhanden)		
Study performance	☐ Exercise performance		
	☐ Laboratory performance		
	☐ Term paper		
	☐ Presentation		
	☐ Certificate		
Exam performance	☒ Written exam		
	☐ Oral exam		
	☐ Term paper		
	☐ Project paper		
	☐ Laboratory performance		
	☐ Final thesis and oral exam		
	☐ presentation		
Usability	Master Industrial Engineering - (PO 2015)	☒ RM	
	Master Mechanical Engineering - Automotive Engineering (PO 2015)	☒ CEM	
	Master Mechanical Engineering - General Mechanical Engineering (PO 2015)	☒ RM	
	Master Interdisciplinary Engineering - (PO 2021)	☒ CEM	
Offer	☒ Winter semester ☐ Summer semester ☐ Irregular		
Workload	Credit points	Contact time	Self-study
	5	60 hours [4 hours per week]	90 hours

Language	German
Duration of the module	1 Semester
Approved aids for the exam performance	None
Lecturer(s)	Mr. Prof. Dr.-Ing. Karl Hofmann-von Kap-herr
Responsible(s)	Mr. Prof. Dr.-Ing. Karl Hofmann-von Kap-herr
Comment	Please note: The language of this lecture is German, no English translation will be provided! The language of the exam for this lecture is also German, all your answers must also be given in German! If you are not able to follow the lecture in German at Master level, please choose another lecture which is held in English.
Change date	12.03.2025

Machine Tools and Production Lines II (M)		
Content	Please note: The language of this lecture is German, no English translation will be provided! The language of the exam for this lecture is also German, all your answers must also be given in German! If you are not able to follow the lecture in German at Master level, please choose another lecture which is held in English. - Cutting machines with geometrically determined cutting edge: turning, drilling - Cutting machines with geometrically indeterminate cutting edge: grinding machines, honing and lapping machines - Colants and lubricants on machine tools - Forming machines, Cutting machine tools - Spark erosion machines, water jet cutting machines - Multi-machine systems, hybrid machine tool concepts - Measuring devices, transmission elements, position measuring systems and control systems - Acceptance of machine tools - Low-noise machine design - Systems for process monitoring - Numerical controls, NC programming - Robots and manipulators - Laser machine	
Competency goals	Upon successful completion of the module, students will be able to describe the boundary conditions for the use of machine tools in the industrial environment. - recognize and compare the design, construction and basic types of machine tools. - derive the requirements for machine tools according to the situation. - Discuss basic machine tool types and basic production equipment types and evaluate them according to their intended use. - Select suitable machine tools for solving a manufacturing task. - Evaluate the use of machine tools and production equipment in the modern manufacturing process. - Evaluate the use of machine tools and production equipment in the production environment and to transfer to similar systems.	
Teaching form	☒ Lecture	
	☐ Exercise	
	☐ Seminar/seminar exercise	
	☐ Laboratory	
	☐ Project	
Recommended Prequesites	• Machine Tools and Production Lines I (M)	
Literature	• Literaturempfehlung: Weck/Brecher, "Werkzeugmaschinen", Band 1-5 (in der Bibliothek mehrfach vorhanden) • Vorlesungsunterlagen, Skript	
Study performance	☐ Exercise performance	
	☐ Laboratory performance	
	☐ Term paper	
	☐ Presentation	
	☐ Certificate	
Exam performance	☒ Written exam	
	☐ Oral exam	
	☐ Term paper	
	☐ Project paper	
	☐ Laboratory performance	
	☐ Final thesis and oral exam	
	☐ presentation	
Usability	Master Mechanical Engineering - General Mechanical Engineering (PO 2015)	☒ RM
	Master Mechanical Engineering - Automotive Engineering (PO 2015)	☒ CEM
	Master Industrial Engineering - (PO 2015)	☒ RM
	Master Interdisciplinary Engineering - (PO 2021)	☒ CEM
Offer	☐ Winter semester ☒ Summer semester ☐ Irregular	

Workload	Credit points	Contact time	Self-study
	5	60 hours [4 hours per week]	90 hours
Language	German		
Duration of the module	1 Semester		
Approved aids for the exam performance	None		
Lecturer(s)	Mr. Prof. Dr.-Ing. Karl Hofmann-von Kap-herr		
Responsible(s)	Mr. Prof. Dr.-Ing. Karl Hofmann-von Kap-herr		
Comment	Please note: The language of this lecture is German, no English translation will be provided! The language of the exam for this lecture is also German, all your answers must also be given in German! If you are not able to follow the lecture in German at Master level, please choose another lecture which is held in English.		
Change date	12.03.2025		

Master Interdisciplinary Project			
Content	The interdisciplinary project contains subject matter from at least two disciplines. The further definition of the content depends on the assigned topic. If possible, the interdisciplinary project is to be worked on in a team. Interdisciplinary projects are typically offered by all professors.		
Competency goals	After successful completion of the module, students will be able to • analyze methodically through the accomplishment of qualified scientific interdisciplinary tasks, the content of which is oriented to the profile of the later professional activity, • develop solutions in the area of technical/informatic qualification, • compare approaches to solutions using scientific working methods, • independently analyze and solve problems, • to publish scientific papers on the work carried out. • Area-specific and cross-area discussions, where appropriate, in the self-organized team.		
Teaching form	☐ Lecture		
	☐ Exercise		
	☐ Seminar/seminar exercise		
	☐ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature	• - Wissenschaftliches Schreiben und Abschlussarbeit in Natur- und Ingenieurwissenschaften, Andreas Hirsch-Weber, Stefan Scherer, UTB Verlag - Entsprechend dem Thema		
Study performance	☐ Exercise performance		
	☐ Laboratory performance		
	☐ Term paper		
	☐ Presentation		
	☐ Certificate		
Exam performance	☐ Written exam		
	☐ Oral exam		
	☐ Term paper		
	☒ Project paper		
	☐ Laboratory performance		
	☐ Final thesis and oral exam		
	☐ presentation		
Usability	Master Interdisciplinary Engineering - (PO 2021)		☒ RM
Offer	☒ Winter semester ☒ Summer semester ☐ Irregular		
Workload	Credit points	Contact time	Self-study
	10	0 hours [0 hours per week]	300 hours
Language	German and English		
Duration of the module	1 Semester		
Approved aids for the exam performance	None		
Lecturer(s)	Alle Professorinnen und Professoren des Fachbereichs Technik		
Responsible(s)	Mr. Prof. Dr. Elmar Seidenberg		
Comment			
Change date	04.03.2025		

Master Interdisciplinary Seminar			
Content	The content of the interdisciplinary seminar is determined at the beginning of the semester. The selection of topics will be based on an interdisciplinary approach. Treatment of a complex topic emphasized. Within the seminar, each participant will (for example) give 2 presentations of 12 minutes each followed by a discussion in the group. In addition, a 4-page scientific paper will be written on the topic. (These requirements may vary depending on lecturer)		
Competency goals	Upon successful completion of the module, students will be able to, • systematically and purposefully identify scientific literature and publications, including those in English and related fields, by appropriate means, • Analyze and evaluate the contents of current, application-oriented and theoretical methods with regard to their relevance to the research question, • to elaborate and present the core of the content, • prepare professional presentations and present them in a convincg maner, • Discussions on scientific topics in the interdisciplinary discourse to be moderated.		
Teaching form	☐ Lecture		
	☐ Exercise		
	☒ Seminar/seminar exercise		
	☐ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature	• - Wissenschaftliches Schreiben und Abschlussarbeit in Natur- und Ingenieurwissenschaften, Andreas Hirsch-Weber, Stefan Scherer, UTB Verlag - Entsprechend dem vergebenen Thema		
Study performance	☐ Exercise performance		
	☐ Laboratory performance		
	☐ Term paper		
	☐ Presentation		
	☐ Certificate		
Exam performance	☐ Written exam		
	☐ Oral exam		
	☒ Term paper		
	☐ Project paper		
	☐ Laboratory performance		
	☐ Final thesis and oral exam		
	☒ presentation		
Usability	Master Interdisciplinary Engineering - (PO 2021)		☒ RM
Offer	☒ Winter semester ☒ Summer semester ☐ Irregular		
Workload	Credit points	Contact time	Self-study
	5	30 hours [2 hours per week]	120 hours
Language	German and English		
Duration of the module	1 Semester		
Approved aids for the exam performance	None		
Lecturer(s)	Alle Professorinnen und Professoren des Fachbereichs Technik		
Responsible(s)	Mr. Prof. Dr. Volker Lücken		
Comment			
Change date	04.03.2025		

Master Thesis - Final Thesis			
Content	The content of the master thesis has an interdisciplinary character. This means that contents of different disciplines are integrated in the thesis. The further content depends on the assigned topic.		
Competency goals	Upon successful completion of the module, students will be able to, • to methodically analyze and develop scientific questions through the accomplishment of qualified development tasks, the content of which is oriented towards the profile of the later interdisciplinary professional activity. • to develop solutions in the field of engineering / informatics qualification, • with scientific/technical/informatic working methods compare and select solutions and justify the selection. • to recognize the framework of professional action in a situation appropriate and cross-situational manner and to reflect on decisions in a responsible and ethical manner. • to analyze and solve problems independently and to acquire new knowledge and skills on their own. • to write technical papers on the work carried out. Students will be able to present and discuss theoretical and methodological issues in front of and with experts in the field, to present and justify their work with sound reasoning.		
Teaching form	☐ Lecture		
	☐ Exercise		
	☐ Seminar/seminar exercise		
	☐ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature	• - Wissenschaftliches Schreiben und Abschlussarbeit in Natur- und Ingenieurwissenschaften, Andreas Hirsch-Weber, Stefan Scherer, UTB Verlag - Entsprechend dem Thema der Arbeit		
Study performance	☐ Exercise performance		
	☐ Laboratory performance		
	☐ Term paper		
	☐ Presentation		
	☐ Certificate		
Exam performance	☐ Written exam		
	☒ Oral exam		
	☒ Term paper		
	☐ Project paper		
	☐ Laboratory performance		
	☐ Final thesis and oral exam		
	☐ presentation		
Usability	Master Interdisciplinary Engineering - (PO 2021)		☒ RM
Offer	☒ Winter semester ☒ Summer semester ☐ Irregular		
Workload	Credit points	Contact time	Self-study
	30	0 hours [0 hours per week]	900 hours
Language	German and English		
Duration of the module	1 Semester		
Approved aids for the exam performance	None		
Lecturer(s)	Alle Professorinnen und Professoren des Fachbereichs Technik		
Responsible(s)	Mr. Prof. Dr. Elmar Seidenberg		
Comment			
Change date	04.03.2025		

Material Management and Logistics (M)			
Content	Competitive vertical integration and procurement Instruments of materials management, production planning and control Approaches to lead time reduction and supply chain management. planning methods		
Competency goals	After successful participation, students will know the basics of materials management and understand the instruments of materials management and supply chain management, including logistics in virtual company networks. The students know the basics of strategic planning within materials management and internal logistics. The students know advantages and disadvantages of different product structures, bill of material structures and numbering systems. The students know the procurement process and material planning procedures. The students understand the different warehouse and supply systems and their advantages and disadvantages.		
Teaching form	☒ Lecture		
	☐ Exercise		
	☐ Seminar/seminar exercise		
	☐ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature	• Becker, Thorsten, Prozesse in der Produktion und Supply Chain, Springer-Verlag, 2008 • Templemeier, Horst, Material-Logistik, 7. Auflage, Springer Verlag, 2008 • Härder, Jürgen „Betriebswirtschaft für Ingenieure“, 4. Auflage, Hanser Verlag, 2010 • Corsten, Hans „Produktionswirtschaft“, 11. Auflage, Oldenbourg Verlag, 2007 • Homburg, Christian, „Quantitative Betriebswirtschaftslehre“, Gabler Verlag, 3. Auflage, 2000 • Wiendahl, Hans-Peter, Betriebsorganisation, 6. Auflage, Hanser Verlag, 2008		
Study performance	☐ Exercise performance		
	☐ Laboratory performance		
	☐ Term paper		
	☐ Presentation		
	☒ Certificate		
Note on study performance	The study performance is a prerequisite for taking the exam		
Exam performance	☒ Written exam		
	☐ Oral exam		
	☐ Term paper		
	☐ Project paper		
	☐ Laboratory performance		
	☐ Final thesis and oral exam		
	☐ presentation		
Usability	Master Industrial Engineering - (PO 2015)	☒ RM	
	Master Mechanical Engineering - (PO 2015)	☒ CEM	
	Master Interdisciplinary Engineering - (PO 2021)	☒ CEM	
Offer	☒ Winter semester ☐ Summer semester ☐ Irregular		
Workload	Credit points	Contact time	Self-study
	5	60 hours [4 hours per week]	90 hours
Language	English		
Duration of the module	1 Semester		
Approved aids for the exam performance	None		
Lecturer(s)	Mr. Prof. Dr. Armin Wittmann		
Responsible(s)	Mr. Prof. Dr. Armin Wittmann		
Comment	For the successful participation in the excursion in the context of the lecture the students receive a test certificate at the end of the course.		
Change date	12.03.2025		

Precision Engineering (M)			
Content	Gear trains with optimized involute gearing (profile shift, helical gearing); interaction of different stiffnesses as a multidimensional problem, deformations of machine tools, bearing deformations, tensioning of machine tool frames and bearings, friction (fixed friction, sliding friction, rolling friction), wear (wear approach for plain bearings with fixed friction); Slip (rolling friction slip, traction slip, slip of belt drives, slip transverse to the rolling friction direction),		
Competency goals	After successful completion of the module, the students are able to understand, design, construct and dimension machines and their components that are to be operated as precisely as possible or are used for high-precision manufacturing. The course covers not only mechanics, but also control engineering, thermodynamics and tribology used.		
Teaching form	☒ Lecture		
	☒ Exercise		
	☐ Seminar/seminar exercise		
	☐ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature	• Hinzen, H.: Maschinenelemente 2 (4. Auflage); De Gruyter Oldenbourg, Berlin/Boston, 2018 • ergänzende Aufgabensammlung auf den Internetseiten des De Gruyter Verlags • Hinzen, H.: Maschinenelemente 3 (2. Auflage); De Gruyter Oldenbourg, Berlin/Boston, 2020 • Hinzen, H.: Maschinenelemente 1 (4. Auflage); De Gruyter Oldenbourg, Berlin/Boston, 2017		
Study performance	☐ Exercise performance		
	☐ Laboratory performance		
	☐ Term paper		
	☐ Presentation		
	☒ Certificate		
Note on study performance	The study performance is a prerequisite for taking the exam		
Exam performance	☒ Written exam		
	☐ Oral exam		
	☐ Term paper		
	☐ Project paper		
	☐ Laboratory performance		
	☐ Final thesis and oral exam		
	☐ presentation		
Usability	Master Industrial Engineering - (PO 2015)	☒ CEM	
	Master Mechanical Engineering - (PO 2015)	☒ CEM	
	Master Interdisciplinary Engineering - (PO 2021)	☒ CEM	
Offer	☒ Winter semester ☐ Summer semester ☐ Irregular		
Workload	Credit points	Contact time	Self-study
	5	60 hours [4 hours per week]	90 hours
Language	German		
Duration of the module	1 Semester		
Approved aids for the exam performance	None		
Lecturer(s)	Mr. Prof. Dr.-Ing. Heiko Bossong		
Responsible(s)	Mr. Prof. Dr.-Ing. Heiko Bossong		
Comment	None None		
Change date	12.03.2025		

Programming of ERP Systems Using the Example of SAP®-S/4HANA®			
Content	- Quick start SAP-ERP MM and PP - The programming language ABAP, screens, internal tables, Open SQL©, data modeler, function blocks		
Competency goals	After successful completion of the module, students will be able to operate the GUI. They have knowledge of object-oriented programming in ABAP Objects©, GUI programming, database programming and recursive programming. They can structure relational data models.		
Teaching form	☒ Lecture		
	☐ Exercise		
	☐ Seminar/seminar exercise		
	☐ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature	• Karl-Heinz Kühnhauser, Thorsten Franz; Einstieg in ABAP • Horst Keller, Sascha Krüger; ABAP Objects; ISBN 978-3-89842-358-8 • Andreas Blumenthal, Horst Keller; ABAP - Fortgeschrittene Techniken und Tools, Band 2; ISBN 978-3-8362-2072-9 • Horst Keller, Wolf Hagen Thümmel; ABAP-Programmierrichtlinien; ISBN 978-3-8362-2090-3		
Study performance	☐ Exercise performance		
	☐ Laboratory performance		
	☒ Term paper		
	☐ Presentation		
	☐ Certificate		
Exam performance	☒ Written exam		
	☐ Oral exam		
	☐ Term paper		
	☐ Project paper		
	☐ Laboratory performance		
	☐ Final thesis and oral exam		
	☐ presentation		
Usability	Master Electrical Engineering - (PO 2019)	☒ CEM	
	Master Industrial Engineering - (PO 2015)	☒ CEM	
	Master Mechanical Engineering - (PO 2015)	☒ CEM	
	Master Interdisciplinary Engineering - (PO 2021)	☒ CEM	
Offer	☐ Winter semester ☒ Summer semester ☐ Irregular		
Workload	Credit points	Contact time	Self-study
	5	60 hours [4 hours per week]	90 hours
Language	German and English		
Duration of the module	1 Semester		
Approved aids for the exam performance	None		
Lecturer(s)	Mr. Prof. Dr. Fritz Nikolai Rudolph		
Responsible(s)	Mr. Prof. Dr. Fritz Nikolai Rudolph		
Comment	None None		
Change date	18.02.2025		

Theory of Drive Technology			
Content	Topics covered: o Dimensioning of transformers and transient processes in transformers. o Surge short circuit for synchronous generators o Slot harmonics in the asynchronous machine o Transient behavior of the asynchronous machine o Field-oriented control of the asynchronous machine o Field-oriented control of the permanently excited synchronous machine o Calculation of linear drives taking into account the end-effecte		
Competency goals	After successful completion of the module, students will understand the dynamic properties of electric drives and will be able to reproduce various situations with the help of simulation tools. They have knowledge of the basic mathematical procedures for the analysis of dynamic problems. Furthermore, they are able to perform calculations for static as well as for dynamic problems magnetic circuits with the aid of an FEM program.		
Teaching form	☒ Lecture		
	☒ Exercise		
	☐ Seminar/seminar exercise		
	☐ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature			
Study performance	☐ Exercise performance		
	☐ Laboratory performance		
	☐ Term paper		
	☐ Presentation		
	☐ Certificate		
Exam performance	☐ Written exam		
	☒ Oral exam		
	☐ Term paper		
	☐ Project paper		
	☐ Laboratory performance		
	☐ Final thesis and oral exam		
	☐ presentation		
Usability	Master Electrical Engineering - (PO 2019)	☒ BM	
	Master Interdisciplinary Engineering - (PO 2021)	☒ CEM	
Offer	☒ Winter semester ☐ Summer semester ☐ Irregular		
Workload	Credit points	Contact time	Self-study
	5	60 hours [4 hours per week]	90 hours
Language	German		
Duration of the module	1 Semester		
Approved aids for the exam performance	None		
Lecturer(s)	Mr. Prof. Dr. Nikolaus Reiland		
Responsible(s)	Mr. Prof. Dr. Nikolaus Reiland		
Comment	Module language: German		
Change date	13.03.2025		

Vehicle Dynamics			
Content	CHAPTER I: INTRODUCTION Classification of vibration, definitions, mechanical vibrating systems, mechanical vibration and human comfort. Modelling and simulation studies. Model of an automobile, one degree of freedom, two degree of freedom systems, free, forced and damped vibrations - Random vibration - Magnification and Transmissibility. Vibration absorber. Multidegree of Freedom Systems-Closed and far coupled system, orthogonally of modal shapes, Modal analysis. CHAPTER II: SUSPENSION Requirements. Spring mass frequency. Wheel hop, wheel wobble, wheel shimmy, Choice of suspension spring rate. Calculation of effective spring rate. Vehicle suspension in fore and aft directions. Hydraulic dampers and choice of damper characteristics. Independent, compensated, rubber and air suspension systems. Roll axis and vehicle under the action of side forces. CHAPTER III: STABILITY OF VEHICLES Load distribution. Stability on a curved track and on a slope. Gyroscopic effects, weight transfer during acceleration and braking, overturning and sliding. Rigid vehicle - stability and equations of motion. Cross wind handling. CHAPTER IV: TYRES Types. Relative merits and demerits. Ride characteristics. Behavior while cornering, slip angle, cornering force, power consumed by a tyre. Effect of camber, camber thrust. CHAPTER V: VEHICLE HANDLING Over steer, under steer, steady state cornering. Effect of braking, driving torques on steering. Effect of camber, transient effects in cornering. Directional stability of vehicles.		
Competency goals	To Understand vibrating systems and its analysis, modeling and simulation and modal analysis To Understand various Suspension systems, selection of springs and dampers To Understand the stability of vehicles on curved track and slope, gyroscopic effects and cross wind handling To Know about tyres, ride characteristics and effect of camber, camber thrust To Learn about vehicle handling under different steering conditions and directional stability of vehicles		
Teaching form	☒ Lecture		
	☐ Exercise		
	☐ Seminar/seminar exercise		
	☐ Laboratory		
	☐ Project		
Recommended Prequesites			
Literature	• wird in der Lehrveranstaltung bekannt gegeben		
Study performance	☐ Exercise performance		
	☐ Laboratory performance		
	☐ Term paper		
	☐ Presentation		
	☐ Certificate		
Exam performance	☒ Written exam		
	☐ Oral exam		
	☐ Term paper		
	☐ Project paper		
	☐ Laboratory performance		
	☐ Final thesis and oral exam		
	☐ presentation		
Usability	Master Interdisciplinary Engineering - (PO 2021)		☒ CEM
Offer	☐ Winter semester ☒ Summer semester ☐ Irregular		
Workload	Credit points	Contact time	Self-study
	5	60 hours [4 hours per week]	90 hours
Language	English		
Duration of the module	1 Semester		
Approved aids for the exam performance	None		

Lecturer(s)	Mr. Prof. Dr. V. Ramanthan
Responsible(s)	Mr. Prof. Dr.-Ing. Peter König
Comment	pure online lecture
Change date	29.11.2024