

## **Kursbeschreibungen**

### **Fahrzeugtechnik**

**7. und 5. Semester**

Stand:04.07.2017

Bezeichnung	P/W/Z	Credits	Lehre (nur Zahl = SWS)	Regel- semester	Seite
Automotive Service Products	P	4	4	7	3
MatLab Application in Mechanical Design		4	4		4
Project II		8	8		5
Advanced Manufacturing Technology**		3	3		6
Finite Element Method**		5	5		7
Hydraulic Transmission**		3	3		8
Control Design and Practice of Manufacturing System	W	3	3	7	9
E-Business		4	4		10
Green Manufacturing		2	2		11
Introductions to Robotics		3	2		12
Automotive Service Management	Z	4	4	5	13
Sensors and Actuators		4	4		14

P: Pflichtfach, W: Wahlpflichtfach, Z: Zusatzfach

\*\* : Wahlpflichtfach fuer die Studierende, die den Kurs an der Heimathochschule schon belegt haben.

<b>CDHAW</b> Chinesisch-Deutsche Hochschule für Angewandte Wissenschaften	Fach	<b>Automotive Service Products</b>		
	Kreditpunkte	<b>4</b>	Sprache	<b>English</b>
<b>Kurzfassung</b>	This course is a specialized course for senior Chinese students and German students who study in Automotive Engineering & Service (AES). The purpose of this course is to let students master the related technologies and be acquainted with the procedure of product development by introducing the typical products and their key technologies in the field of automotive service.			
<b>Lernziele</b>	Students are required to master the basic principles of typical service products and key technologies, gain abilities to operate typical service products, and get acquainted with the procedure of product development.			
<b>Einordnung</b>	BA-Studienprogramm an der CDHAW Studiengänge: FT Regelsemester: 7 [Hauptstudium] Art: Pflichtfach			
<b>Voraussetzungen</b>	Automotive Electrics and Electronics, Actuators and Sensors			
<b>Studieninhalt</b>	<ol style="list-style-type: none"> <li>1. Introduction           <ol style="list-style-type: none"> <li>1.1 Overview of ASP course</li> <li>1.2 Background and Objective</li> <li>1.3 Requirements and Evaluation</li> </ol> </li> <li>2. Tire Pressure Monitoring System           <ol style="list-style-type: none"> <li>2.1 Basic Principles</li> <li>2.2 Typical solutions of TPMS</li> <li>2.2 Applications and exercise</li> </ol> </li> <li>3. Controller Area Network bus and CANoe simulation           <ol style="list-style-type: none"> <li>3.1 CAN specification</li> <li>3.2 CANoe simulation and exercise</li> </ol> </li> </ol>			
<b>Literatur</b>	<ol style="list-style-type: none"> <li>1. Multiplexed Networks for Embedded Systems: CAN, LIN, FlexRay, Safe-by-Wire, Dominique Paret, SAE International, June 20, 2007</li> <li>2. CAN Specification 2.0, Robert Bosch GmbH, 1991</li> </ol>			
<b>Verantwortliche/r</b>	Dr. GUO Weian			

<b>CDHAW</b> Chinesisch-Deutsche Hochschule für Angewandte Wissenschaften	Modul	<b>MatLab Application in Mechanical Design</b>		
	Kreditpunkte	<b>4</b>	Sprache	<b>English</b>
<b>Kurzfassung</b>	This course is an elective course for mechanical design or related major students. The purpose of this course is enable students to master the basic use of MATLAB, and to use professional toolbox skillfully, to build the foundation for the subsequent courses, project design and scientific research.			
<b>Lernziele</b>	Students is required to master the MATLAB data type, matrix input and method of operation, the use of 2D, 3D graphics, methods of function design, and the design of graphical user interface. And students can apply MATLAB skillfully, to solve complex mathematical problems in mechanical design and other related fields.			
<b>Einordnung</b>	BA-Studienprogramm an der CDHAW Studiengänge: MT, FT Regelsemester: 7 [Hauptstudium] Art: Pflichtfach			
<b>Voraussetzungen</b>	Higher Mathematics, Linear Algebra, Mathematical Statistics and Analysis.			
<b>Studieninhalt</b>	Introduction to MATLAB MATLAB Basics Top-down Program Design Relational and Logical Operators Branches and Loops Plots User-defined Function Sparse Arrays, Cell Arrays, and Structures Graphical User Interfaces			
<b>Literatur</b>	- Stephen J. Chapman, MATLAB Programming for Engineers, Beijing: Science press, 2003.			
<b>Verantwortliche/r</b>	Prof. CHEN Ming			

<b>CDHAW</b> Chinesisch-Deutsche Hochschule für Angewandte Wissenschaften	Modul	<b>Project II</b>		
	Kreditpunkte	<b>8</b>	Sprache	<b>English</b>
<b>Kurzfassung</b>	Integrative project for students to apply basic and special knowledge and finish team work.			
<b>Lernziele</b>	Students can prepare and process a mechatronic development project in the field of automotive engineering by applying all knowledge they learned in former courses and experiments. They can especially apply the required engineering methods from analysis and design phase up to realization and test.			
<b>Einordnung</b>	BA-Studienprogramm an der CDHAW Studiengänge: FT Regelsemester: 7 [Hauptstudium] Art: Pflichtfach			
<b>Voraussetzungen</b>	All courses for AES students			
<b>Studieninhalt</b>	<ul style="list-style-type: none"> <li>- Project Analysis</li> <li>- Project design</li> <li>- Project facilities build up and testing</li> <li>- Project facilities running and data collecting</li> <li>- Data analyzing</li> <li>- Project summary</li> <li>- Report preparing</li> <li>- Final Presentation and competitive examination</li> </ul>			
<b>Literatur</b>				
<b>Verantwortliche/r</b>	Prof. CHEN Ming, etc.			

<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>CDHAW</b>          Chinesisch-Deutsche Hochschule          für Angewandte Wissenschaften       </div>	Modul	<b>Advanced Manufacturing Technology</b>		
	Kreditpunkte	<b>3</b>	Sprache	<b>English</b>
<b>Kurzfassung</b>	<p>The course aims at applications of advanced manufacturing technologies, requirements of social development, based contents of advanced manufacturing technologies and potentials of national economic development. Through the course, we endeavor in improving students' innovation ability and strengthening students' competitive power.</p>			
<b>Lernziele</b>	<p>Students will understand and master various new ideas, new methods and new technologies about manufacturing. Students will also understand the frontier in mechatronic major development, widen knowledge areas, fit to change ideas and manufacturing methods from traditional manufacturing to advanced manufacturing.</p>			
<b>Einordnung</b>	<p>BA-Studienprogramm an der CDHAW          Studiengänge: MT, FT          Regelsemester: 7 [Hauptstudium]          Art: Pflichtfach/Wahlpflichtfach</p>			
<b>Voraussetzungen</b>	<p>Mechanical Design, Manufacturing Technology Fundamental, Information Technology</p>			
<b>Studieninhalt</b>	<p>Includes three parts: CIMS and its individual technology; process, technology and equipment of advanced manufacturing; production mode and management of advanced manufacturing. Students will understand and master various new ideas, new methods and new technologies about manufacturing. Students will also understand the frontier in mechatronic major development, widen knowledge areas, fit to change ideas and manufacturing methods from traditional manufacturing to advanced manufacturing.</p>			
<b>Literatur</b>	<p>Advanced Manufacturing Technology. Tang Yiping. Mechanical Industry Press, 2011</p>			
<b>Verantwortliche/r</b>	<p>Prof. XIE Chun</p>			

<b>CDHAW</b> Chinesisch-Deutsche Hochschule für Angewandte Wissenschaften	Modul	<b>Finite Element Method</b>		
	Kreditpunkte	<b>5</b>	Sprache	<b>English</b>
<b>Kurzfassung</b>	Basic theory of finite element method. Application of commercial software MSC.Nastran/Patran. The course is given in English.			
<b>Lernziele</b>	The students understand the fundamentals of finite element method and are able to use the commercial software to solve simple engineering problems.			
<b>Einordnung</b>	BA-Studienprogramm an der CDHAW Studiengänge: MT, FT Regelsemester: 7 [Hauptstudium] Art: Pflichtfach/Wahlpflichtfach			
<b>Voraussetzungen</b>	Mathematics, Matrix theory, Mechanics of Materials, Elasticity.			
<b>Studieninhalt</b>	<ul style="list-style-type: none"> <li>- Mathematical basis of Finite Element Method (FEM)</li> <li>- FEM for plane stress/strain problems</li> <li>- Construction of shape function, convergence criteria of FEM</li> <li>- Characteristics of FEM solutions</li> <li>- Isoparametric element</li> <li>- Numerical integration</li> <li>- 3-dimensional element</li> <li>- Bar/Truss element</li> <li>- Beam element</li> <li>- Plate element</li> <li>- Shell element</li> <li>- Solution methods of large, symmetry and sparse linear equations</li> <li>- Practical considerations for modelling FEM models</li> <li>- MSC.Nastran/Patran learning</li> </ul>			
<b>Literatur</b>	1. David V.Hutton,Fundamentals of Finite Element Analysis, 2004. 2. WANG Xucheng, Finite Element Method, Tsinghua University Press, 2003.			
<b>Verantwortliche/r</b>	Prof. WANG Yu			

<b>CDHAW</b> Chinesisch-Deutsche Hochschule für Angewandte Wissenschaften	Modul	<b>Hydraulic Transmission</b>		
	Kreditpunkte	<b>3</b>	Sprache	<b>English</b>
<b>Kurzfassung</b>	Hydraulic transmission is a basic course for mechatronic engineering major students. According this course, principles of hydraulic elements and basic circuit should be grasped to design a hydraulic system.			
<b>Lernziele</b>	Students can design a hydraulic system and choose proper elements.			
<b>Einordnung</b>	BA-Studienprogramm an der CDHAW Studiengänge: MT, FT Regelsemester: 7 [Hauptstudium] Art: Pflichtfach/Wahlpflichtfach			
<b>Voraussetzungen</b>	Mathematics, Mechanical design, Actuator and sensor, Microprocessor, Control technology			
<b>Studieninhalt</b>	(1) Introduction to hydraulic transmission (2) Fundamental hydraulic fluid mechanics (3) Hydraulic pump and motor (4) Hydraulic cylinder (5) Hydraulic control valve (6) Basic hydraulic circuit (7) Design of hydraulic transmission system			
<b>Literatur</b>	- Chen Shumei, Hydraulic and Pneumatic Transmission(English-Chinese Bilingual), Beijing: China machine press, 2007. ISBN: 978-7-111-22449-5			
<b>Verantwortliche/r</b>	Prof. YU Ying			



<b>CDHAW</b> Chinesisch-Deutsche Hochschule für Angewandte Wissenschaften	Modul	<b>Control Design and Practice of Manufacturing System</b>		
	Kreditpunkte	<b>3</b>	Sprache	<b>English</b>
<b>Kurzfassung</b>	<p>This lecture is one of the core lectures of Mechatronics. Many of the sequential event-driven systems founded today, may be modeled as discrete-event dynamic systems (DEDS). Manufacturing system is one of the typical DEDS.</p> <p>The several different types of manufacturing system would be introduced, such as flexible manufacturing system. Moreover, the control function of the manufacturing system is analyzed deeply. The different characteristics are discussed between the discrete-event dynamic systems and continuous systems. The two important modeling tools would be introduced, which include the Matrix and Petri Nets. Then, we will concern how to establish the model of the DEDS based on the Matrix and Petri Nets and how to analyze the structure and performance of the modeling.</p>			
<b>Lernziele</b>				
<b>Einordnung</b>	BA-Studienprogramm an der CDHAW Regelsemester: 7 [Hauptstudium] Art: Wahlpflichtfach			
<b>Voraussetzungen</b>	<ol style="list-style-type: none"> <li>1. The concept of DEDS, FMS and their characteristics.</li> <li>2. The modeling methods of Matrix and Petri Nets.</li> <li>3. Modeling of manufacturing and DEDS based on the matrix and Petri Nets.</li> <li>4. Design and program of the controller based on the mentioned modeling methods.</li> <li>5. Other modeling methods</li> </ol>			
<b>Studieninhalt</b>	<ol style="list-style-type: none"> <li>(1) Introduction           <ul style="list-style-type: none"> <li>Flexible manufacturing systems and their controllers</li> <li>Summary of approaches to manufacturing system control</li> <li>Dispatching rules and blocking phenomena</li> <li>Introduction of Matrix, Petri Nets and rule-base expert system</li> </ul> </li> <li>(2) Discrete Event Systems           <ul style="list-style-type: none"> <li>Time-driven systems</li> <li>Event-driven systems</li> </ul> </li> <li>(3) Petri Nets           <ul style="list-style-type: none"> <li>Basic definitions</li> <li>Manufacturing system model</li> <li>Analysis manufacturing performance</li> <li>Relation between Petri Nets and Matrix Form</li> </ul> </li> <li>(4) Plc Program           <ul style="list-style-type: none"> <li>Design controller based on Petri Nets</li> <li>Implementation Petri Nets model into the PLC</li> </ul> </li> </ol>			
<b>Literatur</b>	Stjepan Bogdan, Frank L.Lewis, Zdenko Kovacic, Jose Mireles Jr. Manufacturing Systems Control Design. Springer.			
<b>Verantwortliche/r</b>	Prof. XIE Nan			

<div style="border: 1px solid black; padding: 5px; text-align: center;"> <b>CDHAW</b>          Chinesisch-Deutsche Hochschule          für Angewandte Wissenschaften       </div>	Modul	<b>E-Business</b>		
	Kreditpunkte	<b>4</b>	Sprache	<b>English</b>
<b>Kurzfassung</b>	This is a fundamental course of e-business, with the emphasis on it's concepts and applications of electronic business and electronic commerce from a managerial perspective.			
<b>Lernziele</b>	The students should have, after having learnt the course, the basic knowledge of e-business and e-commerce, including, not limited to, their concepts from many perspectives, related technologies mainly concerning modern information technologies, their applications including enterprise e-business systems, their strategies and development methodologies, and management challenges or impact faced by enterprises.			
<b>Einordnung</b>	BA-Studienprogramm an der CDHAW Studiengänge: MT, FT,GT,WI Regelsemester: 7 [Hauptstudium] Art: Wahlpflichtfach			
<b>Voraussetzungen</b>	Abschluss "Basics of Computer Hardware and Software", "Marketing", "Enterprise Business and Management"			
<b>Studieninhalt</b>	<ul style="list-style-type: none"> <li>- Fundamentals of e-business and e-commerce</li> <li>- Information technologies</li> <li>- Business applications of e-business and e-commerce, the enterprise e-business systems</li> <li>- Business and IT strategies and information systems development</li> <li>- Management challenges, ethical and security issues of information systems</li> </ul> 1 SWS Labor			
<b>Literatur</b>	<ul style="list-style-type: none"> <li>- Bocij, P., et al, Business Information Systems, Technology, Development and Management of the E-Business, Pearson Education, 2008</li> <li>- O'Brien, J., Management Information Systems, Managing Information Technology in the Business Enterprise, McGraw-Hill, 2004</li> <li>- Turban, E., et al, Electronic Commerce, A managerial Perspective, Pearson Education, 2010</li> </ul>			
<b>Verantwortliche/r</b>	Dr. LIU Yili			

<b>CDHAW</b> Chinesisch-Deutsche Hochschule für Angewandte Wissenschaften	Fach	<b>Green Manufacturing</b>		
	Kreditpunkte	<b>2</b>	Sprache	<b>English</b>
<b>Kurzfassung</b>	The course explores the recent developments in green manufacturing. It introduces the definition and the importance of green manufacturing, addresses the strategy of analyzing and practicing green manufacturing and examples of applications from the level of the manufacturing process, machine, systems, as well as the supply chain and packaging.			
<b>Lernziele</b>	Students are required to: <ul style="list-style-type: none"> <li>- understand the importance of green manufacturing</li> <li>- get an overview of the strategy of analyzing and practicing green manufacturing</li> <li>- explore the recent developments and applications in green manufacturing</li> </ul>			
<b>Einordnung</b>	BA-Studienprogramm an der CDHAW Studiengänge: MT, FT, WI Regelsemester: 7 [Hauptstudium] Art: Wahlpflichtfach			
<b>Voraussetzungen</b>	manufacturing technology			
<b>Studieninhalt</b>	<ul style="list-style-type: none"> <li>- Introduction to Green Manufacturing</li> <li>- Principles of Green Manufacturing</li> <li>- Closed-Loop Production Systems</li> <li>- Environmentally Friendly Machining</li> <li>- Green Manufacturing Through Clean Energy Supply</li> <li>- Packaging and the Supply Chain</li> <li>- Green Manufacturing With Focus On the Automobile</li> </ul>			
<b>Literatur</b>	<ol style="list-style-type: none"> <li>1. David A. Dornfeld, Green Manufacturing: Fundamentals and Applications, Springer, 2013</li> <li>2. Paulo Davim, Green Manufacturing: Process and Systems, Springer, 2013</li> <li>3. U.S. Dixit   D.K. Sarma   J. Paulo Davim, Environmentally Friendly Machining, Springer, 2012</li> </ol>			
<b>Verantwortliche/r</b>	Dr. WANG Lujiong			

<b>CDHAW</b> Chinesisch-Deutsche Hochschule für Angewandte Wissenschaften	Modul	<b>Introductions to Robotics</b>		
	Kreditpunkte	<b>3</b>	Sprache	<b>English</b>
<b>Kurzfassung</b>	<p>This lecture presents an overview of robotics, which includes kinematics, dynamics, control theory, sensor technologies, and programming languages for robots. The purpose is to help students be familiar with the basic knowledge of robots.</p> <p>It is designed for all Chinese students and foreigner exchange students, and given totally in English.</p>			
<b>Lernziele</b>	<p>The objectives of this course are to help students understand the basic principles of robotics, acquire basic knowledge of kinematics and dynamics in robotics, and know the programming language for robots. Students will know the development of robots in the state of the art. Several demos are to help student cultivate their interests in robotics..</p>			
<b>Einordnung</b>	<p>BA-Studienprogramm an der CDHAW          Studiengänge: FT          Regelsemester: 7 [Hauptstudium]          Art: Wahlpflichtfach</p>			
<b>Voraussetzungen</b>	<p>This lecture is open to all students who meet prerequisites involving electronics, mechanics, control theory, and necessary basic mathematical knowledge.</p>			
<b>Studieninhalt</b>	<p>The lecture focuses on the basic knowledge of robotics including kinematics, modelling, dynamics, mechanics, linear and nonlinear control theory for robots, sensor technologies, programming languages in robotics.</p>			
<b>Literatur</b>	<p><b>1.</b> John J.Craig, “Introduction to Robotics : Mechanics and Control” , Third Edition, Prentice Hall, 2005;  <b>2.</b> S. K. Saha, “Introduction to robotics” , McGraw-Hill Education (India), 2008</p>			
<b>Verantwortliche/r</b>	Associate Prof. GUO Weian			

<b>CDHAW</b> Chinesisch-Deutsche Hochschule für Angewandte Wissenschaften	Modul	<b>Automotive Service Management</b>		
	Kreditpunkte	<b>4</b>	Sprache	<b>Deutsch</b>
<b>Kurzfassung</b>	Aufbau und Betrieb einer Serviceorganisation im Kfz-Bereich			
<b>Lehrziele</b>	Erlangen von Verständnis für Aufbau und Betrieb einer Serviceorganisation im Kfz-Bereich, Kennenlernen der Steuerungsinstrumente.			
<b>Einordnung</b>	BA-Studienprogramm an der CDHAW Studiengänge: FT Regelsemester: 5 [Hauptstudium] Art: Zusatzfach			
<b>Voraussetzungen</b>				
<b>Studieninhalt</b>	<ul style="list-style-type: none"> <li>- Funktion des Marktes</li> <li>- Organisationen</li> <li>- Relationen Service/Verkauf</li> <li>- Betriebs- und Gebietsanalysen</li> <li>- Imageanalyse von Betrieben und Marken</li> <li>- Arbeitsqualität/Qualitätsmanagement</li> <li>- Kundenbetreuung/Betreuungskompetenz</li> <li>- Marktbearbeitung vom Auftrag bis zur Kundenzufriedenheit</li> </ul>			
<b>Literatur</b>	- Handbuch Service-Organisation (z.B. VW)			
<b>Verantwortliche/r</b>				

<b>CDHAW</b> Chinesisch-Deutsche Hochschule für Angewandte Wissenschaften	Modul	<b>Sensors and Actuators</b>		
	Kreditpunkte	<b>4</b>	Sprache	<b>Deutsch</b>
<b>Kurzfassung</b>	binäre/digitale/analoge Sensoren, elektromech., piezo-elekt., indukt., kapazit., opt., akust., radiol. Sensoren pneum./elektromagn. Aktoren, Sensoren für Pos, Winkel, Kraft, Moment, Geschw., Beschleunigung, AC/DC Dreh-/Linearmotoren, Schrittmotoren, Antriebsverstärker			
<b>Lehrziele</b>	Erlernen des Aufbaus industrieller Meßsysteme und des Zusammenwirkens der Komponenten.			
<b>Einordnung</b>	BA-Studienprogramm an der CDHAW Studiengänge: FT Regelsemester: 5 [Hauptstudium] Art: Zusatzfach			
<b>Voraussetzungen</b>	Abschluss "Elektronik 1"			
<b>Studieninhalt</b>	<ol style="list-style-type: none"> <li>1. Grundbegriffe der Messtechnik</li> <li>2. Sensoren zur elektrischen Erfassung physikalischer Größen</li> <li>3. Analoge Messtechnik           <ul style="list-style-type: none"> <li>· Messsignalaufbereitung</li> <li>· analoge Filtertechnik</li> </ul> </li> <li>4. Digitale Messtechnik           <ul style="list-style-type: none"> <li>· Abtastung und Quantisierung</li> <li>· AD-Umsetzungsverfahren</li> <li>· Messdatenerfassungssysteme</li> <li>· digitale Signalverarbeitung</li> <li>· Bussysteme</li> </ul> </li> <li>5. Aufbau elektrischer, pneumatischer und hydraulischer Aktoren</li> <li>6. Speicherprogrammierbare Steuerungen (SPS)</li> <li>7. Vernetzung Sensorik/Aktorik/Steuergeräte zu Systemen</li> <li>8. Übungen mit Laborbetrieb</li> </ol> <p>1 SWS Labor</p>			
<b>Literatur</b>	<ul style="list-style-type: none"> <li>- Hesse, Schnell: Sensoren für die Prozess- und Fabrikautomation. 3. Aufl. Vieweg.</li> <li>- Merz: Elektrische Maschinen und Antriebe. VDE Verlag.</li> </ul>			
<b>Verantwortliche/r</b>				