

Courses offered in English - School of Engineering

Note: For all courses from the **Dep. Of Industrial Engineering**: please refer to the course list and syllabi on the ISP Website: www.hs-pforzheim.de/isp/courses

On this website you can find all courses from the Dept. of Industrial Engineering starting with the course ID **BAExxxx**.

This document contains the course offer from the Dept. of Mechanical Engineering and the Dept. of Information Technology/Electrical Engineering:

Courses offered in the English language summer term 2019

For Engineering students

Courses from the Department of Mechanical Engineering

| ID | Course Title | Hours | ECTS credits | Lecturer | Summer 2019 | Winter 2019/20 | Additional Info / Registration |
|---------|----------------------------|-------|--------------|--------------------------|-------------|-------------------|--------------------------------------------------------------------------------------------------------------------|
| MEN3751 | Stamping | 2 | 3 | Prof. Dr. Matthias Golle | offered | not announced yet | If interested, please contact isp-engineering@hs-pforzheim.de |
| MEN3742 | Laser Materials Processing | 2 | 3 | Prof. Dr. Roland Wahl | offered | not announced yet | If interested, please contact isp-engineering@hs-pforzheim.de |
| MEN3311 | Electric Machines | 2 | 3 | Prof. Dr. Peter Heidrich | not offered | offered | If interested, please contact isp-engineering@hs-pforzheim.de |
| MEN3331 | Automotive Technology | 2 | 3 | Prof. Jürgen Wrede | offered | not announced yet | If interested, please contact isp-engineering@hs-pforzheim.de |

Courses from the Department of Information Technology/ Electrical Engineering

| ID | Course Title | Hours | ECTS credits | Lecturer | Summer 2019 | Winter 2019/20 | Additional Info / Registration |
|---------|-----------------------------------|-------|--------------|---------------------------------|-------------|----------------|--------------------------------------------------------------------------------------------------------------------|
| EEN2035 | HMI/ GUI Graphical User Interface | 2 | 3 | Prof. Dr. Karlheinz Blankenbach | offered | offered | If interested, please contact isp-engineering@hs-pforzheim.de |
| CEN3246 | C# Programming | 2 | 3 | Prof. Dr. Sascha Seifert | not offered | offered | If interested, please contact isp-engineering@hs-pforzheim.de |

Course Descriptions from the Department of Mechanical Engineering

Stamping MEN3651

Level: Introductory

ECTS-Credits: 3

Contact Hours: 30 total

Content: Stamping integrates several manufacturing methods into one process with a single stroke of a press. The individual manufacturing methods included in stamping are blanking, forming (e.g. bending, stamping, deep drawing etc.) and joining. The mass manufacture of stamping parts is a highly-automated process. Products manufactured using pressing techniques can be found in almost all everyday objects. Contents of the lecture are: Basic principles of metallography and forming, material requirements for stamping parts, basic principles of blanking, forming techniques in stamping technology, joining techniques in stamping technology and basic principles of forming presses.

Courses offered in English - School of Engineering

Laser Materials Processing MEN3642

Level: Advanced Level 1

ECTS-Credits: 3

Contact Hours: 30 total

Pre-requisites: Elementary lectures in Physics, containing the field of Optics

Content: Fundamentals: Laser beam sources for materials processing, beam characteristics, beam transport via fibers, focusing. Laser materials processes: Welding, brazing, cutting, hardening, cladding, drilling, marking. All laser materials processes are described in their function, attainable results and application examples.

Machineries for laser materials processing: Laser materials processes often allow high feed rates in manufacturing. To take advantage of this in production applications often advanced machinery has to be employed. Contemporary advanced machinery is described (e.g. robots with scanners or sensors).

Electric Machines MEN3511

Level: Advanced

ECTS-Credits: 3

Contact Hours: 30 total

Content: Magnetic fields in electric machines: field equations; materials: electric sheets and permanent magnets; force generation; magnetic equivalent circuit (mec); modeling of a simple geometry using the mec and calculation of inductances and forces. Conclusions concerning the basic design of the cross-section of electric machines. Windings and coils: distributed and concentrated coils; electric isolation. Thermal aspects: losses generated in electric machines; cooling; thermal equivalent circuit (tec); modeling of a simple electric machine using the tec. Dimensioning of the shaft of an electric machine. Recapitulation of the mathematical model of brushed direct current (dc) machines. Models of the brushed alternating current (ac) universal machine; model of brush-less dc machines. From the dc machine to the permanent magnet synchronous machine (PMSM) with field oriented control. Field-weakening of PMSM. Application examples of electric machines, especially of PMSM: in robots, in hybrid and fully electrified vehicles (automobiles, e-bikes, railway vehicles, ...).

Automotive Technology MEN3533

Level: Intermediate

ECTS-Credit: 3

Contact Hours: 30 total

Pre-requisites: Basic mechanics

Content: Introduction to automotive technology, requirements for automotive components, longitudinal and lateral vehicle dynamics, basic tire dynamics, basic design of drive train including gearbox, function of combustion engine (Otto and Diesel), alternative drive systems including hybrid and electric vehicles, brake systems and components, function of ABS and Electronic Stability Program, Driver Assistance Systems.

Courses offered in English - School of Engineering

Course Descriptions from the Department of Electrical Engineering and Information Technology

HMI / GUI / Graphical User Interface EEN2035

Level: Intermediate

ECTS-Credits: 4

Contact Hours: 60 total

Pre-requisites: Basic skills in software programming like C, JAVA, HTML; however project can also be done by MS POWERPOINT using Command Buttons

Content: The lectures give an introduction in the development of Humina Machine Interfaces (HMI) and Graphical User Interface Design (GUI). These topics are essential for designing human interaction with software easy and hazzle-free. Sophisticated HMIs and GUIs are the key point when using software like automation in manufacturing (e.g. process visualization, machine control etc.) and on PCs and smartphones. Sluggish screen design and performance is often the reason why an operator needs much time or makes costly faults using software. The lecture starts with fundamental concepts and human visual parameters and metrics(resolution, character size color, color coding) which are relevant for software front end screen design. The basics of Screen Design like navigation, windows (frames), controls, graphics, text input and output are presented using practical examples. However this theoretical background alone will not result in the competence to develop great HMIS and GUIs. Therefore the lecture is accompanied by an practical HMI/GUI project in groups of two or three students designing an implementation of a common task for all. The projects will be presented and evaluated within the course by the other students in terms of the classical methods like heuristic evaluation, cognitive walk-throughs and classic usability tests with users. This enables the students to develop effective software user interfaces.

C# Programming CEN3246

ECTS-Credits: 3

Contact Hours: 60 total

Content: C# is a modern, object-oriented programming language intended to create simple yet robust programs and frequently requested in job offers . C# is the core language of the Microsoft .NET framework. In this course, students gain the skills to exploit the capabilities of C# and of the .NET Framework to develop programs useful for a broad range of desktop applications. Topics are: basic and advanced C# features, desktop programming using .NET frameworks WPF and ADO.NET.