

Syllabus
BAE2521 Production Engineering and Manufacturing 2
Prof. Dr. Kai Oßwald
Summer Semester 2024

Level	Bachelor	
Credits	3	
Student Contact Hours	2	
Workload	90 hours	
Prerequisites	Fertigungstechnik I + II Einführung in die Konstruktionslehre Advanced English for Engineers	
Time	s. LSF	
Room	s. LSF	
Start Date	s. LSF	
Lecturer(s)	Name	Prof. Dr. Kai Oßwald
	Office	T2.2.14
	Virtual Office	Virtual Office of Prof. Dr. Kai Oßwald
	Office Hours	Wednesday 09:45-11:15
	Phone	(07231) 28-6461
	Email	kai.osswald@hs-pforzheim.de

Summary

The course deals with the most important issues of automated industrial production, focusing on technical subjects and shop floor related issues. The main objective is to give student an overview over the most important components of automation technology and their applications.

Outline of the Course

Automation
Industrial IoT
Sensors
Machine Vision and Identification
Fluidic Actuators
Machine Drives and Actuators
Machine Components
Machinery Safety

Course Intended Learning Outcomes and their Contribution to Program Intended Learning Outcomes / Program Goals

Program Intended Learning Outcomes		Course Intended Learning Outcomes
After completion of the program the students will be able...		After completion of the course the students will be able...
1 Expert Knowledge		
1.2	...to demonstrate their solid key knowledge in Mechanical Engineering.	...to understand automation and its components (I4.0, IIoT etc.)
2 Digital Skills		
2.1	...to know and understand relevant IT software tools used in business and their features and have a solid understanding of digital technologies.	...to understand the fundamentals of machine controls (PLC/CNC) and their programming.
3 Critical Thinking and Analytical Competence		
4 Ethical Awareness		
5 Communication and Collaboration Skills		
6 Internationalization		
6.1	...to understand and explain business challenges in an international context.	...identify international aspects of production and automation (standardization, dimensional systems, power grids, etc.).
6.2	...to articulate themselves in a professional manner in international business.	...to Apply technical knowledge and vocabulary in the context of manufacturing and automation (incl. Industry 4.0, IIoT, etc.).

Teaching and Learning Approach

The course will be run as a “classical” lecture plus some demonstrations and several exercise elements.

Literature and Course Materials

- Nicholas P. Sands; Ian Verhappen (2018): A Guide to the Automation Body of Knowledge, Third Edition. International Society of Automation, ISBN 978-1-941546-91-8.
- RealPars Youtube-Channel: <https://www.youtube.com/user/ParsicAutomation/videos>

Assessment

There will be a 60 min written final exam for this course (together with “Produktion I”) at the end of the semester.

Grading

Students will be graded on a scale of 1 = excellent, 2 = very good, 3 = satisfactory, 4 = pass and 5 = fail.

Schedule

N/A

Academic Integrity and Student Responsibility

N/A

Teaching Philosophy

I want to contribute to your learning progress in terms of technical understanding and engineering abilities. I will try to show you the practical importance of the issues of this course. Questions – during the course or during my office hours (“Kolloquium”) – are very welcome and will be answered either in the course or individually.

Additional Information

Learning Objectives

By the end of the course students

- Will understand automated industrial production processes
- Will have an overview over the components of automation
- Will know the specific challenges of manufacturing chains
- Will know characteristic designs and components of machines and production lines