Business PF
Business School
Fakultät für Wirtschaft und Recht
Hochschule Pforzheim

HS PF

Syllabus

PAL3113 Industrial Process Automation Management

Prof. Dr.-Ing. Dominik Berbig

Winter Semester 2022

Level	Bachelor	
Credits	3	
Student Contact Hours	2	
Workload	90 hours	
Prerequisites	Proof of English language skills. Successfully completed first stage of studies. Studies well in progress. Knowledge in business management.	
Time	See schedule	
Room	W1.3.03	
Start Date	See schedule	
Lecturer	**Name**	Prof. Dr.-Ing. Dominik Berbig
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Summary

The students get a general overview and learn on how the megatrends digitalization and automation influence (logistics) processes on the shop floor and in the office as well as how they affect human resources and management in general to become fit for future. The lecture summarily covers topics like big data management, (robot process) automation, human-machine-interaction, augmented reality, design thinking, sustainability and the Internet of Things.

Outline of the Course

- Digitalization and automation – Facts, figures and trends
- Changes @ shop floor process – I4.0, robotics (AGV, AMR, HMI) & augmented reality
- Changes @ office and IT process – Big data analytics, digital twin, cloud, API & RPA
- Changes @ HR and management – Examples, effects & Design Thinking as example
- Practical lecture to deepen and broaden knowledge
- Learning by teaching on further trends in the area of digitalization and automation in logistics

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

Program Intended Learning Outcomes		Course Intended Learning Outcomes	Assessment Methods*	
	After completion of the program the students will be able…	After completion of the course the students will be able…	Essay	Project Work
			50 %	50 %
			Individual	Collective
1	**Expert Knowledge**			
1.1	…to demonstrate their distinguished and sound competencies in General Business Administration.	…to explain and judge how digitalization and automation will change the way of working and have prepared own examples.	x	x
1.4	...to solve business problems based on profound data research skills and by applying quantitative methods.	…to judge what e.g. big data analytics means, how it can be applied and which benefits it has.	x	
1.5	...to demonstrate profound expert knowledge in their field of specialization.	…via learning by teaching approach to create and prove expertise in business relevant aspects of digitalization.		x
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 describe e.g. big data analytics, augmented reality, API and RPA, have seen some automation use case examples and (if possible) created some themselves.	x	
2.2	...to effectively use and apply information systems to develop solutions in business settings.	…judge when processes can be automated and how by using RPA and how big data analytics can help.	x	(x)
2.3	...to effectively use digital technologies to interact, to collaborate and to communicate.	…to do easy to understand presentations and explanations in an online format and to cooperate remotely.		x
3	**Critical Thinking and Analytical Competence**			
3.1	...to implement adequate methods in a competent manner and to apply them to complex problems.	…to create expertise in one complex topic on their own and to share this knowledge in an appropriate way with others.		x
3.2	...to critically reflect and interpret findings and to develop comprehensive solutions for complex problems.	…to select what is really relevant to a topic (➔ learning by teaching) and to also reflect on pros and cons of it.	x	x
4	**Ethical Awareness**			
5	**Communication and Collaboration Skills**			
5.1	...to express complex issues effectively in writing.	…to condense knowledge such that it fits into easy to understand slides and/or to reproduce it.	x	x
5.2	...to demonstrate their oral communication skills in presentations.	…to teach others on a certain topic in appropriate manner.		x
5.3	...to work successfully in a team by performing practical tasks.	…to cooperate in (virtual) teams to solve a common task during the group work phase.		x
6	**Internationalization**			
6.1	...to understand and explain business challenges in an international context.	…to explain how digitalization and automation affect companies worldwide.	x	

Teaching and Learning Approach

The teaching and learning approach consist of three parallel parts: lecture, practical lecture (if possible) and learning by teaching via a group work.

During the lecture, students get the sound and general knowledge base regarding important impacts of digitalization and automation on current way of working and management.

This knowledge will be deepened and broadened by ideally at least one practical lecture offering the chance to get further insights and to have discussions with the external expert.

Learning by teaching means that the students are split into several groups. Each of these groups decides in alignment with the lecturer on at least one complex, current topic of practical relevance out of the field of digitalization and automation. Every group prepares a corresponding lecture on the commonly agreed topic(s) autonomously. This lecture will be taught by the group to the whole audience, ideally incorporating different ways of teaching. To anchor these findings sustainably and as these lectures are relevant for the assignment as well, they have to be documented in written form (comprehensive lecture slides & further required relevant documents) and handed-in.

Literature and Course Materials

Specific literature per chapter, e.g.

- Toy, J., Gesing, B., Ward, J., Noronha, J., and Bodenbenner, P.: The Logistics Trend Radar. 5th Edition. Troisdorf: DHL Customer Solutions & Innovation
- Plattner, H., Meinel, C., and Leifer, L. (Editors): Design Thinking Understand-Improve-Apply. Heidelberg: Springer
- Bughin, J., Hazan, E., Lund, S., Dahlström, P., Wiesinger, A., and Subramaniam, A.: SKILL SHIFT: AUTOMATION AND THE FUTURE OF THE WORKFORCE. McKinsey Global Institute
- Furmans, K., Berbig, D. and Fleischmann, T.: Evaluating the potential of new material handling equipment with stochastic finite elements analysis. In: Proceedings of the 7th International Conference on “Stochastic Models of Manufacturing and Service Operations”, Ostuni: Aracne, 142–150

Always latest version

Lecture slides containing further literature will be provided through the e-learning platform.

Assessment

The assessment consists of two parts, an individual assignment plus a group work including a presentation (learning by teaching).

The individual assignment takes place at the end of the semester and results in the individual grade for the lecture. Preparation time is approx. 4 weeks, details follow during the lecture. It has to be handed in before the lecture period ends.

The presentation of the group work (30 – max. 45 minutes each) will take place within the second half of the lecture period. Together with the corresponding documents and the group work itself, its outcome is the collective grade for the lecture. There may also be peer review within groups as needed.

Both parts have to be passed during the same semester.

The final score is based to 50 % on the individual grade on the assignment and to 50 % on the collective group work result.

In justified cases, it is also possible to deviate from joint grading in the case of group performances. Generally, the respective authorship must be indicated for all documents to be submitted (group and individual performances) (e.g. in the case of presentations by naming the creator of this slide in the respective footer).

Please note that your registration is binding after the end of the registration period. This is necessary because the full participation of all registered students is very important for the quality of the courses. Therefore, no registrations or withdrawals from the course are possible after the registration phase. Deregistration after the end of the registration phase from the course will be considered as "failed".

Attendance is compulsory for all presentation dates. Unexcused absences will result in a grade deduction or, in the case of multiple occurrences, failure of the course.

Schedule (draft, subject to change – latest status information during lectures only)

Date	Time	Topic
04.10.2022	19:00 - 20:30	General information & Introduction
11.10.2022	19:00 - 20:30	Changes in process - part I
18.10.2022	19:00 - 20:30	Changes in process - part II
25.10.2022	19:00 - 20:30	Changes in IT - part I
01.11.2022	**19:00 - 20:30**	**ALL SAINTS' DAY**
08.11.2022	19:00 - 20:30	Changes in IT - part II
15.11.2022	19:00 - 20:30	Coaching & Changes in IT - part III
22.11.2022	19:00 - 20:30	Practical exercise => No lecture
29.11.2022	19:00 - 20:30	Coaching & Changes and requirements for HR & management - part I
06.12.2022	19:00 - 20:30	Changes and requirements for HR & management - part II
13.12.2022	19:00 - 20:30	Changes and requirements for HR & management - part III
20.12.2022	19:00 - 20:30	Your lectures - part I
27.12.2022	**CHRISTMAS HOLIDAY**	
03.01.2023		
10.01.2023	19:00 - 20:30	Your lectures - part II
17.01.2023	19:00 - 20:30	Buffer
24.01.2023	19:00 - 20:30	Questions & Answers

Code of Conduct for online Teaching

Link to the Code of Conduct for online Teaching

Additional Information

Communication:

In support of this course, an e-learning platform will be used which offers several advantages. Firstly, teaching material will be made available via this platform. Secondly, questions that might arise can be discussed among the students through the use of this platform. Finally, general questions can be answered transparently by the lecturer, i.e. all students will be able to see the answers. For specific questions, you may always contact the lecturer in person or via email.

Organization of the student work:

- The instructions for the essay & presentation are given during class. The presentation needs to be prepared in groups.
- Students must attend all presentations and discussions of the team work, too, as they are relevant to the exam as well.
- More details regarding organisation will be announced during class.