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|-----------------------------|--|----------------------|---------|
| <b>Modul – No.</b>          | <b>755</b>   | <b>Mandatory</b>     |         |
| <b>Module name</b>          | <b>Industry 4.0</b>                                |                      |         |
| Module coordinator          | Dr. Christoph Brodhun / Prof. Dr.-Ing. Thomas Hühn |                      |         |
| Title                       | Industry 4.0                                       |                      |         |
| Title of examination        | Industry 4.0                                       |                      |         |
| Semester                    | 02 / 03  |                      |         |
| Course Type                 | Language   | Lecture and exercise | English |
| SWS/ ECTS/ Workload         | 4  | 5                    | 150     |
| Requirements for attendance | None   |                      |         |

## 1. Content and objectives

### Course Description:

The lecture deepens the knowledge regarding the logistical activities within and between companies as well as end users. The following are dealt with in detail:

1. Basics and Trends
2. Definition, Goals, Integration
3. Potentials, Effects, Need for Design
4. Practical Examples

### Objectives:

After successful participation in the lecture, the students have a production-specific overview of the subject of Industry 4.0 and Smart Factory. The students know the basic ICT technologies in manufacturing companies. They are familiar with cyber-physical systems (CPS) and radio frequency identification (RFID). They can also transform the benefits from big data analytics into smart data. Upon completion of the learning process, the successful student will be able to answer specific questions about security aspects in data networks including cloud approaches. As part of the Industry 4.0 course, students develop the essential basics of the topic and undertake a critical reflection against the background of data security, workplace development, etc. In addition, seminar presentations convey the essential technology drivers to the students. Building on this knowledge, the students can apply the knowledge they have acquired in form of a publication on the subject of Industry 4.0 in a company. It is important to develop the requirements in order to implement the guiding principles of Industry 4.0 at a medium-sized practice partner and to present this requirements paper to a selected group of employees. The students understand the potential and the degree of complexity of future-oriented production scenarios and they can identify with specific project topics.

### Recommended Literature:

- Vogel-Heuser, B.; Bauernhansl, T.; Ten Hompel, M.; (Hrsg) (2017): Handbuch Industrie 4.0 Bände 1-4
- Vogel-Heuser, B.; Bauernhansl, T.; Ten Hompel, M.; (Hrsg.) (2014): Industrie 4.0 in Produktion, Automatisierung und Logistik Anwendung Technologien · Migration, Springer, Wiesbaden
- Meinhardt, S.; Pflaum, A. (Hrsg.) (2019): Digitale Geschäftsmodelle Band 2: Geschäftsmodell-Innovationen, digitale Transformation, digitale Plattformen, Internet der Dinge und Industrie 4.0. Wiesbaden : Springer Vieweg, 2019
- Heyse, V. (2018): Mittelstand 4.0 - eine digitale Herausforderung : Führung und Kompetenzentwicklung im Spannungsfeld des digitalen Wandels. Münster : Waxmann, 2018
- [https://www.bmbf.de/files/Umsetzungsempfehlungen\\_Industrie4\\_0.pdf](https://www.bmbf.de/files/Umsetzungsempfehlungen_Industrie4_0.pdf)

## 2. Methods of instructions

Lecture, tutorials, exercises and assignments. The topics are deepened through excursions and discussions. Films, case studies and short presentations complement the lectures.

## 3. Requirements for attendance

Bachelor degree & interest to investigate further.

## 4. Usability of this module

Mandatory for all master students of „Computer Engineering for IoT Systems“ this lecture is appropriate for students coming from business administration as well.

## 5. Requirements for assessment

35 % written exam

65 % assignments

## 6. ECTS credits

5 ECTS credits

## 7. Frequency of offer

Every winter term

## 8. Work load

150 h of total work load, from:

- 30h lecture participation (online or in presence)
- 30h seminar participation (online or in presence)
- 30h homework & self-study
- 60h presentation & team work

**9. Duration of module**

1 semester