Module Description, available in: EN

Digitalisation in industry

General Information

Number of ECTS Credits

3

Module code

TSM_DigInd

Valid for academic year

2020-21

Last modification

2019-08-31

Coordinator of the module

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Explanations regarding the language definitions for each location:

- Instruction is given in the language defined below for each location/each time the module is held.
- Documentation is available in the languages defined below. Where documents are in several languages, the percentage distribution is shown (100% = all the documentation).
- The examination is available 100% in the languages shown for each location/each time it is held.

	Lausanne			Lugano	Zurich		
Instruction					**X** E 100%		
Documentation					**X** E 100%		
Examination					**X** E 100%		

Module Category

TSM Technical scientific module

Lessons

2 lecture periods and 1 tutorial period per week

Entry level competences

Prerequisites, previous knowledge

None.

Brief course description of module objectives and content

This module offers an overview of digitization in industry from several perspectives.

Content

Section 1: Product Lifecycle Management

- Introduction of end-to-end process (As-Required, As-Design, As-Built, As Maintained)
- Product lifecycle and closed loop lifecycle management
- Development of mechatronic products (HW/SW Co-Development)
- Generating master data for mechatronic products
- Customizable products and modularization

- Engineering Change management

Section 2: Digitization in Production
- Introduction to Production Management
- Prozessleitsysteme, Bussysteme und Protokolle, MES
- Optimization of production based on digital tools
- Examples and Use Cases of digitization in production
- Lean Management and digitization

Section 3: Digitalization of Products
- Digitization driven new Business Models
- Sensor to information: communication and aggregation of data
- Reliability, security and accessablity
- Digital Twins
- Discussion of specific Use Cases - Market & Operational Excellence

Aims, content, methods

Learning objectives and competencies to be acquired

- The students obtain an overview of the processes, data structures and information flows based on different product strategies inside a company.
- They are qualified to evaluate different approaches to organize a company regarding the product strategy, product architecture, the production processes and the deployed IT solutions. Relying on this, they are able to identify and apply optimization strategies.
- They are familiar with state-of-the-art concepts of digitization in order to classify efficiency and transparency in production processes (industry 4.0).
- They are familiar with the basic concepts of digitized products (Internet of Things) and how these are linked to the processes and data streams of the original company in oder to increase the range of product related services or business models.
- They can rationally decide between "digital" and "non-digital" solution concepts.

Module content with weighting of different components

Teaching and learning methods

Literature

Assessment

Certification requirements

Module does not use certification requirements

Basic principle for exams

As a rule, all standard final exams are conducted in written form. For resit exams, lecturers will communicate the exam format (written/oral) together with the exam schedule.

Standard final exam for a module and written resit exam

Kind of exam

Written exam

Duration of exam

120 minutes

Permissible aids

No aids permitted

Special case: Resit exam as oral exam

Kind of exam

Oral exam

Duration of exam

30 minutes

Permissible aids

No aids permitted