

COMPUTER SCIENCE

(required language level B2) **MASTER LEVEL**

Subject to change /status March 2022

**FOR
MASTER
STUDENTS
ONLY!**

	Description	Lecturer	CP / ECTS	Term
LECTURE: Engineering ICPS (Industrial Cyber-Physical Systems)	Principles and the standard IEC 62890, the students will learn, using examples and case studies from real industrial ICPS, the product and production system engineering life cycle with the value streams it contains.	Mr Colombo /Mr Veltink	5	fall
LECTURE: Robotic Systems	Overview of different types of robots including structural and behavioral specifications: working-space, energy-sources, etc. Introduction to Robotic	Mr Colombo / Mr Kane	5	fall
LECTURE: Digital Economy & Society	Boundaries between countries and cultures increasingly lose their importance. This course deals on the one hand with change management of the digitization in organizations and businesses.	Mr Mäkiö / Ms Krüger-Basener	5	fall
LECTURE: Analytics & Mathematics	The lecture approaches concepts, algorithms and technology for the analysis of a large amount of data Numerical methods for solving high-dimensional linear and non-linear systems of equations, as well as the process for calibration and Maximum-Likelihood will be addressed.	Mr Colombo/mr Wings	5	fall
LECTURE: Digitalization & Virtualization of ICPS	A description of how development processes, production lines, manufacturing machinery, field devices and the products themselves can be digitalized and configured as Industrial Cyber-Physical components will be introduced	Mr Colombo / Ms Pechmann	5	spring
LECTURE: Innovation Management	Software development, creative problem solving and idea generation, idea evaluation techniques, write workshop, major characteristics of the Open Innovation paradigm (OI2.0).	Mr Colombo / Mr Mäkiö	5	spring
LECTURE: Industrial Cyber-Physical Systems (ICPS)	A set of technologies and architectural patterns to enable the specification, implementation and operation of industrial cyber-physical systems under the DIN SPEC 91345:2016-04 (RAMI4.0: Reference Architecture Model for Industry 4.0) and Industrial Internet-Reference Architecture (IIRA) standards will be a core part of the lecture's contents.	Mr Colombo	5	spring
LECTURE: Industrial Data Transport Technologies	Ensure end-to-end digital integration of actuator and sensor signals across different levels right up to the upper levels of an enterprise. It is also necessary to develop modularization and reuse strategies in order to enable ad hoc networking and re-configurability of ICPS systems.	Mr Colombo	5	spring