



<b>Modulbezeichnung</b>	<b>Digitalization &amp; Virtualization of ICPS</b>
<b>Semester</b>	WPF
<b>Dauer</b>	1 Semester
<b>Art</b>	Wahlpflichtmodul
<b>ECTS-Punkte</b>	5
<b>Studentische Arbeitsbelastung</b>	30 h Kontaktzeit + 120 h Selbststudium
<b>Voraussetzungen (laut BPO)</b>	
<b>Empf. Voraussetzungen</b>	Teilnahme an Modul ICPS
<b>Verwendbarkeit</b>	MaMb
<b>Prüfungsform und -dauer</b>	Studienarbeit
<b>Lehr- und Lernmethoden</b>	Seminar
<b>Modulverantwortlicher</b>	A. W. Colombo
<b>Qualifikationsziele</b>	<p>Within a modular structured and reconfigurable smart industrial environment, industrial cyber-physical systems (ICPS) manage, control and monitor physical processes, create a digital copy (cyber-shadow) of the physical world and make decentralized decisions. Over the Internet-of-Things the ICPS communicate and cooperate with each other and humans in real time. Via the Internet-of-Services, both internal and cross-organizational services are offered and both kind of services can be utilized by participants of the whole value chain. Based on the technological concepts of ICPS, IoT and IoS, the students will understand the set of steps required to digitalize HW- and SW-components of an industrial enterprise. Students will be able to analyse those components (“digitalized Things“ or “I4.0-components“) under the various perspectives, such as data maps, functional descriptions, communications behavior, hardware/assets or business processes.</p>
<b>Lehrinhalte</b>	<p>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. A set of technologies and architectural patterns to enable the digitalization of industrial cyber-physical systems under the DIN SPEC 91345:2016-04 and Industrial Internet-Reference Architecture standards, based on the 6 vertical individual layers and their interrelationship will be introduced, both in general and in industrial application. This will include: (i) approaches for implementation of a Com-</p>