Competence matrix for the working world 4.0 - mechatronics and electronics

COMPETENCE CHANGE AREAS	WORK PROCESSES FOR COMPETENCE DEVELOPMENT / COMPETENCES				
1. Installation and startup initiation of Cyberphysical Systems (CPS)	He/She is able to install standardized components of cyberphysical systems (CPS). He/She is able to select, install and configure wired, optical and wireless transmission media to network link CPS. He/She complies with legal and operational internal requirements for data protection and data security in dealing with CPS.	He/She is able to configure and parameterize components and systems using suitable software. He/She uses ERP systems to record and document the system function via available system parameters. He/She combines connects automation and information technology components horizontally and vertically.	He/She is able to integrate subsystems in order to adapt the function volume according to given specifications. He/She is able to use ERP systems to adapt and document the production processes. He/She is able to program new applications to connect multiple components or objects and to integrate them into the process chain.	He/She is able to integrate automated processes into an ERP system.	
2. Maintenance of Cyberphysical Systems (CPS)	He/She is able to exchange standardized components of cyber physical systems.	He/She is able to localize and eliminate disturbances with the help of digital assistance systems (remote control). He/She is able to carry out the maintenance of the CPS on the basis of prepared edited big data.	He/She is able to provide spare parts software-controlled “just in time”. by procurement of. He/She is able to filter and process relevant product information from media offerings (e.g., manufacturer portals) using search strategies.	He/She is able to perform customized maintenance of machine and plant components based on continuous data collection processes.	He/She is able to retrieve call up large amounts of data / big data of the production, to prepare edit and to evaluate them by suitable algorithms and to derive preventive maintenance measures. EQF 5-6
3. Operation and monitoring of Cyberphysical Systems (CPS)	He/She is able to apply industry-specific production planning software products (ERP) in order to perform order processing in the production unit. He/she ensures data protection by applying existing security measures. He/she monitors measures to secure the data by using existing backup systems.	He/She is able to use the industry-specific software products of production planning software products (ERP) to monitor the production process. He/She is able to implement visualization software to monitor process data. He/She is able to identify and analyze sources of error in CPS systems. He/She ensures the operation of a networked system by using autonomous or adaptive components and systems.	He/She is able to use the industry-specific production planning software products (ERP) to optimize the production process at the workplace. He/She is able to optimize the energy efficiency of CPS systems.		He/She is able to select relevant parameters for transfer to the ERP system so that processes can be monitored and optimized. EQF 5/6
4. Planning of Cyberphysical Systems (CPS)	He/She is able to prepare and exemplarily apply 3D drawings for rapid prototyping. He/She is able to use networked planning and product management systems by mobile devices.	He/She is able to use methods to model components of equipment (e.g. rapid prototyping). He/She is able to select and process customer and process data in ERP systems.	He/She is able to use computer simulation and virtual representations (e.g. VR, AR) of real CPS systems for planning. He/She considers legal and internal requirements for energy efficiency and environmental protection.	He/She is able to implement and configure ERP systems.	He/She is able to develop procedures for cooperation between production and logistics. EQF 5/6 He/She is able to apply the increased occupational safety requirements in the development of interactive collaborative CPS systems (e.g. Cobots).
5. Organization of work processes in connected process chains	He/She is able to adapt the work process to changing production processes.	He/She is able to work together cooperate with the various production and business units within the process chain.	He/She is able to adapt the work process to changing production processes.	He/She is able to optimize the efficiency of the production process.	

Co-funded by the Erasmus+ Programme of the European Union