Internet of Things – Plant Irrigation

With this project teachers will have the oportunity to work with a complete project that covers a wide range of Industry 4.0 technologies (Electronics, Operating Systems, Networks, Software Development, ECloud, Realtime database). With this project teachers will also learn how to teach with a Project Based Methodology as this project is a great starting point project for future students projects development.

Teachers of all Electronics, Operating Systems, Networks and Software Development has to be coordinated to this integrated project. It is also possible to teach each submodule in an isolated way, but the best results are if they are integrated as it would be better to practice with a real full Industry 4.0 project.

Future IT teaching new methodologies are more focus in Project Base Learning. And this project has this approach in the way that the students are learning a real project with great possibilities of go into details and make up new other project based on this ideas. The goal of the teacher is open the doors to each technologies and make the student reflect about new features.

Competences Trained by Working on this Module

Competence Matrix Teachers Vet 4.0			
Digital Competences			
Competence Development Fields	**1. Professional Competences 4.0**	**2. Media competences**	**3. Application Know-how**	**4. Basic ICT Know-how and Skills**
A. To develop and implement annual teaching plan and to manage documents	1.1. To identify technological and organizational changes in the mechatronics and electronics in the systemic way for the training course and to prepare them didactically. 1.2. To evaluate the possibilities and risks of the digitalized work and business processes. 1.3. To restructure networked process chains in learning 1.4. To train by applying content of embedded systems, including their operating systems. 1.5. To provide know-how on handling interactions with sensors, reading information and collecting of data. 1.6. To train on handling the processes of robotics (robot and "cobot"), including know-how to program and control production robots in the different technological processes. 1.7. To provide know how on the installation and exploitation of the Internet of Things and CPS.	2.1 To identify and assess digital key competences applied in the ICT media. 2.2 To identify the media competences applied in the work, business and social contexts. 2.3 To design and plan the installation of the media technologies in the school. 2.4 To organize cooperation of learners in the digital learning environment. 2.5 To organize knowledge management.	3.1. To install learning management systems. 3.2. To install specialized social media 3.3. To install professional software for learning 3.4. To select and install the didactic instruments for cooperative learning 3.5. To document the digital teaching plans for common (cooperative) usage. 3.6. To handle software for management.	4.1 To install professionally Office software appliances. 4.2 To configure and set-up learning management systems. 4.3 To provide digital applications in the local area network
B. To plan and design learning processes	1.1. To design the concept of digital process chain (4.0) in the teaching and learning process. 1.2. To select digitalized learning and teaching scenarios that facilitate problem oriented and self-organized learning. 1.3. To plan and execute interactive, virtual and individual learning phases. 1.4. To organize the interdisciplinary cooperation in the learning process.	2.1. To select, install and evaluate the digital teaching and learning scenarios. 2.2. To check the used media for accessibility/openness, problem solving and requirement level. 2.3. To check on how the media facilitate development of decision making skills, abilities to cooperate and creativity.	3.1 To install the elements of digital learning scenarios and formats (Blended und Online-Learning)	4.1. To integrate audio and video data 4.2. To prepare video-tutorials 4.3. To prepare Digitalized Content 4.4. To integrate the data from external and internal sources in the teaching. 4.5. To consider copyright protection issues.
C. To communicate, cooperate	1.1. To select interactive media for learning and training. 1.2. To present the information and data fior learners by using interactive media. 1.3. To ensure the safety of personal and corporate data used in the training and work processes.	2.1. To execute timely and operative communication with the internal (school) and external addressees regardless their location and time.	3.1. To apply the digital communication instruments for the regular and remote teaching. 3.2. To use electronic teaching diaries.	4.1. To evaluate the data of learning, teaching and work processes. 4.2. To handle inquiries and feedback from the digitalized instruments.

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Tasks

1. Please, retrace the student module and the intended learning process.

Tools: [mapped teacher matrix](), [student's module](), [basic questions]()

2. If necessary, rebuild the final product by your own. Tools: [student's module](),
3. Reflect on where there were difficulties and how to avoid them in class.
4. Consider the need for adjustment with regard to your own students and map the competence matrix for students.

Tool: [competence matrix for students]()

5. Adjust the module or refine it by filling out these forms:

[Explanation of the structure of student`s modules]()
[Form Sequencing student`s module]()
[Learning Modules Requirement]()
[Evaluation student`s module]()

6. Evaluate your own learning process.

Tool: [Evaluation form]()

- [code.zip]() (1,8 MiB)
- [Index - Learning Modules.docx]() (7,1 KiB)
- [Setting up Raspberri Pi.docx]() (4,0 MiB)
- [Module 1. Electronic Devices Connections.pdf]() (2,0 MiB)
- [Module 2. Raspberry Pi, Phython Development.pdf]() (1,0 MiB)
- [Module 3. Firebase (Real time database) Cloud DB.pdf]() (291,2 KiB)
- [Module 4. Angular and Ionic.pdf]() (373,4 KiB)
- [Module 5. CharJS , Real time graphics.pdf]() (164,9 KiB)
- [Plant Irrigation. Integration of 5 submodules.pdf]() (182,6 KiB)

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Assessment

Assessment of all products to be delivered:

- list of important changes of work processes for your students
- list of competences you and your students need to reach
- list of competences you want to acquire in short-term
- your students' module
- an evaluation tool

Evaluation

Reflect and exchange your experience with other colleagues (in your working group or a virtual working group), define a focus you want to reflect on with your students and create a suitable evaluation tool for them.

⇒   Proposal for Self Reflection

Useful links

- https://www.surveymonkey.de/
- https://www.limesurvey.org/de/
- https://www.umfrageonline.com/
- https://de.wordpress.com
- https://de.jimdo.com/
- https://de.wix.com/
- https://www.weebly.com/de
- https://www.tumblr.com/
- https://www.blogger.com