



Digital Manufacturing Master Degree to set specialists for the dawn of the Industry 4.0

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C3 – Learning Teaching Training Activity

Digital learning tools

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1. Executive Summary

The present document aims to provide the main topics to include in the DIGIMAN project Learning Activity, to be carried out in February 2022, in Budapest, Hungary.

This Learning Activity will be focusing on **Digital learning tools (C3)**, which can be used in the whole master's program to administrate lessons, teaching materials, exams, tests, and grades.

This activity will be coordinated, conducted and hosted by Budapesti Muszaki es Gazdasagtudomanyi Egyetem (HU), with the participation of all partners from DIGIMAN project: Augmented Training Services S.L. (ATS – Spain), European Federation for Welding Joining and Cutting (BE), Universidade de Lisboa (PT), Universitatea Tehnica Cluj-Napoca (RO), University of Craiova (RO) and Hochschule Heilbronn (GER).

2. Learning Activities | Main Purposes

DIGIMAN aims to elaborate a master programme study related to digital manufacturing in order to meet the needs and challenges of Industry 4.0 and therefore to improve the performance of the companies.

The contents from this master programme will be tested in a set of Learning Activities (C1-C3), or short-term training courses, which have two basic purposes:

1. Provide training to trainers to acquire new competences for digital manufacturing.
2. Validation of digital education tools.

These Learning Activities will consist of:

- Increasing the teachers competences in terms of digital manufacturing by participating to short-term courses as well as improving their teaching methods using new innovative digital education tools.
- Increasing the teachers digital competences in the field of virtual reality, augmented reality and mixed reality by participating to short-term courses.
- Increasing the harmonization in teaching process by using same teaching methodology and lessons materials according to disciplines and subjects.
- New qualification of the 16 trainers/teachers.

2.1 C3. Digital learning tools

Digital learning tools is an important section of the master's program because all the teacher and student must use them during the course. To learn these digital software are necessary to administrate the teaching notes, exams, grades and any other data which is essential for the students.

During the project, most of the learning tools were collected and tried, then based on these tries, the bests were chosen.

In this event, these programs and software were presented and taught the basic use.

3. Topics to be covered in the “Digital learning tools” learning activity

For the five days of learning activity, the topics to be covered are the following:

- Presenting and learn to use the following digital administration programs: Moodle, Microsoft Teams
- How to keep the student’s attention in the lesson
- Examination
- C3 Evaluation

As this is a theoretical-practical course, visits have also been included to:

- Welding lab
- Polymer lab
- Manufacturing lab
- Vibration and simulation lab

The participants were learnt in 8 hours/day how to:

- create new profile and save data
- enrolled students
- upload teaching materials
- create and exam or test
- evaluate exam or test
- give points and grades for student
- start online video conference
- involve external partners
- how to transfer to the practical lesson

4. Participants’ Profile

The course started in Mercure Hotel Korona in-person, with the following participants:

UCV – Gabriel Benga, Adrian Olei, Danut Savu, Sorin Savu
ATS- Seabery – Marta Toronjo Leandres, Rocio Diaz Gomez
UTCN- Nicu Balc, Alina Popan
BME- Janos Dobranszky, Dorina Kovacs, Balázs Varbai
Ulisboa – Ines Ascenso Pires, Bárbara Perry Gouveia
EWF – Ana Filipa Mendes
Heilbronn University – Ferdinand Burkhardt

5. Materials to be used in C3 Learning Activity

Trainers who will conduct *Digital learning tools* learning activity need to have at their disposal:

- Agenda with indication of the activities to be carried out during the five days of the short-term training course and respective slots of time.
- Material to carry out the training course, such as:
 - Video conference room
 - Internet connection /WI-FI
 - Laptops
 - Paper and pen
 - Whiteboard and markers
 - Software

In the end of the short-term training course, each participant will fill in an online Satisfaction Survey (Created by EWF) and got a certification about the course (see in Annex), which will help the consortium to understand if the event had a positive effect on participants, as well as if there is a need for improvements to be implemented in the next short-term training courses to be delivered.

6. Summary of main activities

DAY 1

Hour	Activity	Trainer/Affiliation
09.00	Registration	All Participants
09.30	C3. Summarizing of learning activities discussion about the administration systems, examing and learning methods	Dorina Kovacs / BME Balazs Varbai / BME All participants
11.00	Coffee Break	
11.30	C3. Presentation of digital learning tools	Balazs Varbai / BME
13.00	Lunch Break	
14.00	C3. Training program using of administration systems, create test, project works, lectures	Dorina Kovacs / BME
16.00	Wrap up of the 1 st day course	All Participants
17.00	End of the 1 st day course	

The first day of the LTTA was held in Mercure Hotel Korona, Budapest. After the organizers and the coordinators welcomed the participants the first presentation and discussion were led by the Budapest organizers. All the project participants summarized and discussed the digital tools used for the online learning and examine methods. BME has presented the collected and evaluated digital learning tool platforms and all the participants discussed the pros and cons for each platform. In the afternoon presentation, one test course was created and evaluated in the

Moodle system, with special attention to the grading system and the possibility for online material sharing.



DAY 2

Hour	Activity	Trainer/Affiliation
09.00	C3. Discussion about type of evaluation (multiple choice, true or false, numerical, oral, essay)	All participants
11.00	Coffee Break	
11.30	C3. Simulation of exams situation	All participants
13.00	Lunch Break	
14.00	C3. Visiting of a digital manufacturing lesson	BME
16.00	Wrap-up of the 2 nd day course	All Participants
17.00	End of the 2 nd day course	

The second day was also organized in Mercure Hotel Korona, Budapest. During the morning sessions all the participants discussed the possibilities for the DIGIMAN content sharing with the possible students and the stakeholders. Also, the evaluation system was discussed by the led of ATS. We agreed on the number of questions and the type of the evaluation. After the coffee break an online pilot exam was evaluated by UCV. In the afternoon sessional the participants visited an online course from BME about the digital manufacturing topic and we shared our experiences in the possibilities of online education systems.



DAY 3

Hour	Activity	Trainer/Affiliation
09.00	C3. Welding training program	Janos Dobranszky / BME
11.00	Coffee Break	
11.30	C2. Welding training program	Janos Dobranszky / BME
13.00	Lunch Break	
14.00	C3. Robotic welding training program	Janos Dobranszky / BME
16.00	Wrap-up of the 3 rd day course	All Participants
17.00	End of the 3 rd day course	

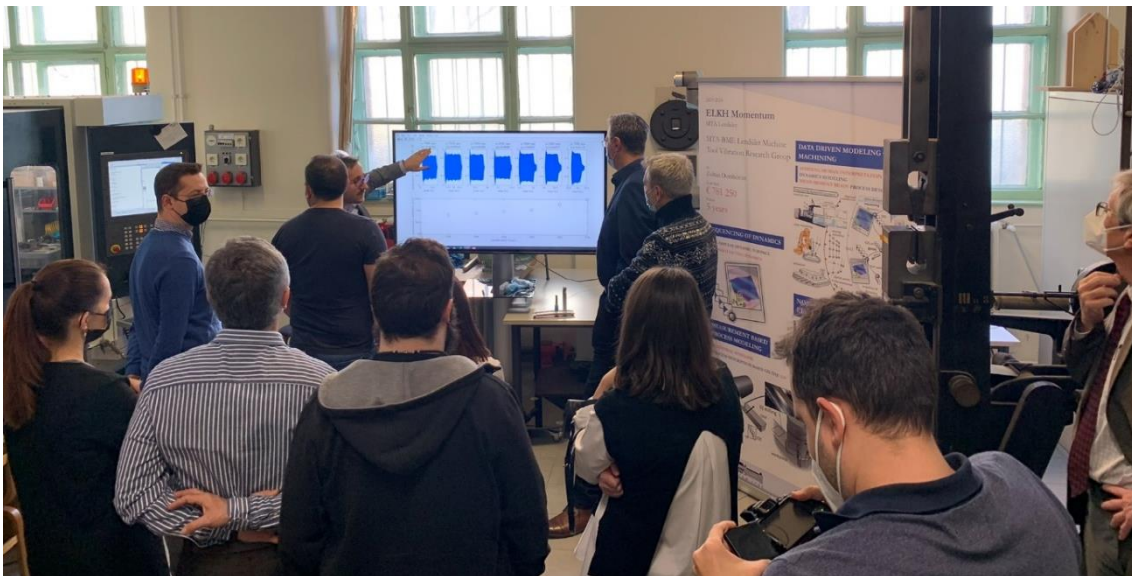
The third day was organized at BME in the laboratory building G. Here the participants discussed digital educational tools for welding and manufacturing related education in the morning session. In the afternoon session an invited presenter showed the current state-of-art in robotic welding manufacturing with special attention to the monitoring, controlling and sensor systems. The dean of the Faculty of Mechanical Engineering also welcomed the participants.



DAY 4

Hour	Activity	Trainer/Affiliation
09.00	C3. Training program: Vibration in digital manufacturing	BME
11.00	Coffee Break	
11.30	C3. Training program: Simulation in digital manufacturing	BME
13.00	Lunch Break	
14.00	C3. Training program: Technologies in digital manufacturing	BME
16.00	Wrap-up of the 4 th day course	All Participants
17.00	End of the 4 th day course	

The fourth day was organized at BME in different laboratories. In the morning all the participants visited the Mechanics Faculty, where the research of manufacturing machines vibration and sensor technologies. The partners discussed how the digital learning tools can be integrated into manufacturing education and how joint research projects can be organized involving students and international participants. In the afternoon all the participants visited the Department of Manufacturing Technology, where the cyber-physical laboratory was introduced after a short presentation on digital manufacturing.





DAY 5

Hour	Activity	Trainer/Affiliation
09.00	C3. Discussions on the shared content during the course	All Participants
11.00	Coffee Break	
11.30	C3. Discussions on the shared content during the course	All Participants
13.00	Lunch Break	
14.00	C3. Examination	All Participants
16.00	C3.Evaluation	All Participants
17.00	End of the 5 th day course	

The fifth day was organized at BME at the Department of Materials Science and Engineering. Here the partners discussed the details for the learning management system. ATS lead the discussion and showed the possibilities for the online courses and its accessibility for the students and the stakeholders. The participants also discussed the reviews for the learning materials, so the content can be finalized and uploaded to the LMS.

