



# DIGIMAN

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

**2019-1-RO01-KA203-063486**

**Short-term joint staff training events**

**C#2 Digital Manufacturing**

**October 25-29, 2021**

## 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 October 2021, in Lisbon, Portugal.

This Learning Activity was focused on **Digital manufacturing (C2)**, 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 Universidade de Lisboa (PT), with the participation of all partners from DIGIMAN project: Augmented Training Services S.L. (ATS – Spain), European Federation for Welding Joining and Cutting (BE), Budapesti Muszaki es Gazdasagtudomanyi Egyetem (HU), Universitatea Tehnica Cluj-Napoca (RO), University of Craiova (RO) and Hochschule Heilbronn (GER) which attended online the C2 course

## 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.

### 3. C3. Digital manufacturing

The topic approached during the short-term course was related to latest the developments and technologies in digital manufacturing and how those technologies can be integrated into the field of Industry 4.0. This learning activity allowed the participants to gain new digital and technical competences which will be later transferred to countries of the project consortium by training other 2 teachers/organization

### 4. Participants' Profile

The course started in IST premises in-person, with the following participants:

UCV – Gabriel Benga, Adrian Olei, Danut Savu, Iulian Stefan

ATS- Seabery – Marta Toronjo Leandres, Rocio Diaz Gomez

UTCN- Alexandru Popan, Alina Popan

BME- Dorina Kovacs, Balázs Varbai

Ulisboa – Ines Ascenso Pires, Bárbara Perry Gouveia

EWf – Ana Filipa Mendes, Joao Marques

Online

Heilbronn University – Gerrit Meixner, Philip Schaefer

### 5. Materials to be used in C3 Learning Activity

Trainers who will conduct *Digital manufacturing* activity had 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



## 6. Summary of main activities

**Organizer:** IST | Lisboa

The short term occurred in a hybrid way, via teams and at Lisbon from 25-29, 2021, at IST and was hosted by Instituto Superior Técnico.

Most of the partners attended the course presential at IST facilities except the partner from Heilbronn that attended via teams.

### Day 1 – Monday, October 25th, 2021

Started with an Overview – objectives, expected results and agenda of the Short training programme concerning – experience exchange/learning from each other.

**9:30 Welcome ( IST)**

**9:45 Introduction to the latest developments and technologies in digital manufacturing (EWF)**

**10.30 Coffee Break**

**11:00 An overview on the seven AM processes/technologies**

**13.00 Lunch Break**

**14.00 Detailed presentation of specific processes: Powder Bed Fusion (PBF)-Laser Beam Processes Directed Energy Deposition (DED)-Arc Process and Directed Energy Deposition (DED)-Laser Beam Processes (EWF)**

**15.00 Group discussion and validation of the topics analysed during the session.**

**16:00 End of day1 course**



## Day 2 – Tuesday, October 26th, 2021

**09.30** Presentation of Quality Assurance and Quality Control in Additive Manufacturing and Post processing in AM (IST)

**10.30** Coffee Break

**11.00** Group discussion and validation of the topics analysed before coffee break.



**13.00 Lunch Break**

**14.00 Presentation of Computer modelling and simulation (BME)**

**15.0 Group discussion and validation of the topic presented.**

**16:00 End of day2 course**





### Day 3 – Wednesday, October 27th, 2021

- 09.30 Presentation of Energy systems (BME)
- 10.30 Coffee Break
- 11.00 Discussion and validation of the topics analysed.

13.00 Lunch Break

- 14.00 Visit to the Mechanical Technology Lab (IST)
- 15:00 End of day3 course

### Day 4 – Thursday, October 28th, 2021

- 09.30 Presentation of Rapid tooling for competitive additive manufacturing (UTCN)
- 10.30 Coffee Break
- 11.00 Discussion and validation of the topics analysed.

13.00 Lunch Break

- 14.00 Presentation of Digital/robotized welding/joining lesson material (UCV)
- 15:00 End of day4 course



## Day 5 – Friday, October 29th, 2021

**09.30 Presentation of Design of Digital Manufacturing lesson material (UCV)**

**10.30 Coffee Break**

**11:00 Discussion, final balance and evaluation of the short – term course in Digital manufacturing**

**12.00 Filling out the Questionnaires and end off meeting**

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