

KA1 ERASMUS+ FOR EDUCATORS

"3D Printing"

Digital Idea Scientific Association

Presentation

3D printing refers to a set of cutting-edge technologies which create physical products through the addition of materials, usually layer by layer, and not by some conventional subtractive treatment, like turning or milling. It is a significant technological innovation. It has been in development for almost 30 years and has now reached a level of maturity that allows more and more commercial applications with added value, and, at the same time, substantially enhanced strategic value. Today, 3D printers can print not only plastic matter, but also materials such as titanium and human cartilage, and produce fully operable systems and complex mechanisms such as batteries, transistors, and LEDs.

3D printing is now considered to be a driving force for innovation which, within the next decade, will completely transform industrial production and will change the whole world. The next industrial revolution has already started through the unprecedented possibilities and opportunities that 3D printing gives to every person so that they can create, innovate, and construct. 3D printers create physical objects straight from the digital models of the computer. That way, the users can grasp, implement, try, and assess their ideas immediately and share them digitally with the rest of the world. The Internet has brought a revolution in the way digital media are created, edited, and shared. Now, 3D printing does the same for physical objects.

The advantages of 3D printing in correlation with other production technologies will lead to radical changes in the way many things are designed, developed, produced, and supported. This educational program has been designed to inform those who already have a career in the sectors of design and manufacture, but also to prepare whoever wishes to pursue a rising career in those sectors and have acknowledged the significant implications of 3D printing. After the completion of the program, the trainees will have been equipped with practical experience over the techniques of 3D printing and they will have gained a critical view of its advantages and restrictions and will be able to explore the possibilities it offers.

Objectives

The purpose of this educational unit is to enrich the knowledge in matters that regard the design and applied engineering of 3D printing technologies. The trainees will model, build, test, compare and repeat any of the previously mentioned procedures needed, on three-dimensional mechanical objects they have designed. With the completion of their training, they will have the ability:

- To learn and interpret the basic historical factors which formed the industrial manufacture in the last centuries.
- To clarify the current and up-and-coming applications of 3D printing in various sectors.

- To characterize the advantages and restrictions for each 3D printing method.
- To evaluate real, everyday scenarios and suggest the most suitable application of 3D printing.
- To locate opportunities for saving time and reducing cost with the application of 3D printing technology.
- To discuss the economic effects of 3D printing, including those on start-up businesses and logistics chains.
- To design, print and optimize 3D objects.

Pre-departure

Trainees will receive a questionnaire, which will provide information on their background, qualifications, and previous experience with CAD-CAM, and Additive Manufacturing (3D Printing), as well as their expectations of the course.

Target groups

The program is addressed to those who want to be informed about the possibilities, the advantages, and the restrictions of 3D printing; those who want to design 3D objects with free, easy-to-use software and want to familiarize themselves with the use and operation of 3D printers. It is also addressed to those who already have some experience in industrial design and manufacture and wish to expand their abilities with those that 3D printing offers.

The Trainers

The trainers have a very deep knowledge of the principles and techniques of digital design and industrial manufacture with the use of the electronic computer (CAD-CAM). Trainers also possess a long experience in designing and modelling three-dimensional models and in 3D printing them into physical objects, as well as the customization and operation of 3D printers.

Labs

The lessons will take place in modern full equipment laboratories.

Language of the course

English

Program

Day 1

Participant arrival, individual orientation and information about the venue and the city.

Presentation of the course, the trainers, and participants.

Introduction to 3D printing technology – Part 1

- History of 3D Printing
- Insights
- How it Works

Familiarization with the laboratory

- Safety rules
- General Guidelines
- Permissions and prohibitions

Day 2

Introduction to 3D printing technology – Part 2

- Software and Hardware
- Materials, Designs, and Applications

Create digital solid models by designing

- 3D Design principles
- Common terms and use of 3D design applications

Lab 1: 3D printing of a cube and a cylinder

- Configuration and 3D Printing settings
- Preview procedure and initialize the 3D print process

Day 3

Converting ideas to physical objects – Part 1

- What is different with 3D printing
- On the edge
- How will the Business world change?

Design solid objects

- Create and modify solid objects from 2d sketches
- Arrange and combine complex solid objects
- Advanced techniques

Lab 2: 3D printing of solid objects

- Configuration and 3D Printing settings
- Preview procedure and initialize the 3D print process

Day 4

Converting ideas to physical objects – Part 2

- Design Thinking in Action
- What is the Future?

Capture 3D objects by scanning

- Common terms and actions
- Devices and techniques for 3D scanning

Lab 3: 3D printing of scanned objects

- Configuration and 3D Printing settings
- Preview procedure and initialize the 3D print process

Day 5

3D Printing Development and Education

- 3D Printing in Education, A case study

Working with surface models

- Create and import models
- Sculpt options and parameters
- Optimize models with the Analysis tools

Lab 4: 3D printing of surface objects

- Configuration and 3D Printing settings
- Preview procedure and initialize the 3D print process

Day 6

Course wrap up

- Solid and surface models
- Design and capture procedures
- 3D printing parameters overview

Final evaluation and conclusion

- Space for discussion of future cooperation and planning follow up activities
- Final evaluation and validation of learning outcomes
- Certification ceremony and participants' departure

Fees

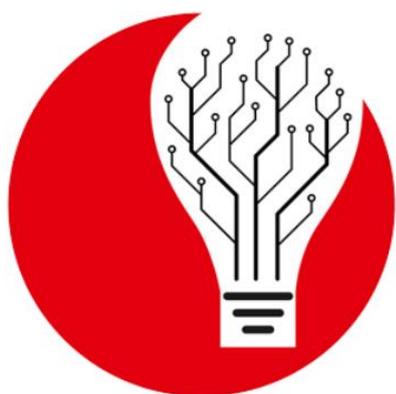
Course fee: 480,00€ (VAT included). It includes:

- ✓ Preparation for the course
- ✓ Training materials
- ✓ Administration costs
- ✓ Organizational costs

Follow-up

Trainees will be given soft and hard copies of all lesson materials, which they can review at their leisure in addition to presenting them to their colleagues at their organizations. Also, an e-community of participants will be created to exchange ideas and experiences.

Erasmus+ KA1 Courses in Greece



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- ✓ **Minimum number of participants: 6**
- ✓ **Maximum number of participants: 18**

If you have a group of 6 staff or more, please contact us for convenient dates