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3D MODELING



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Introduction to 3D MODELING

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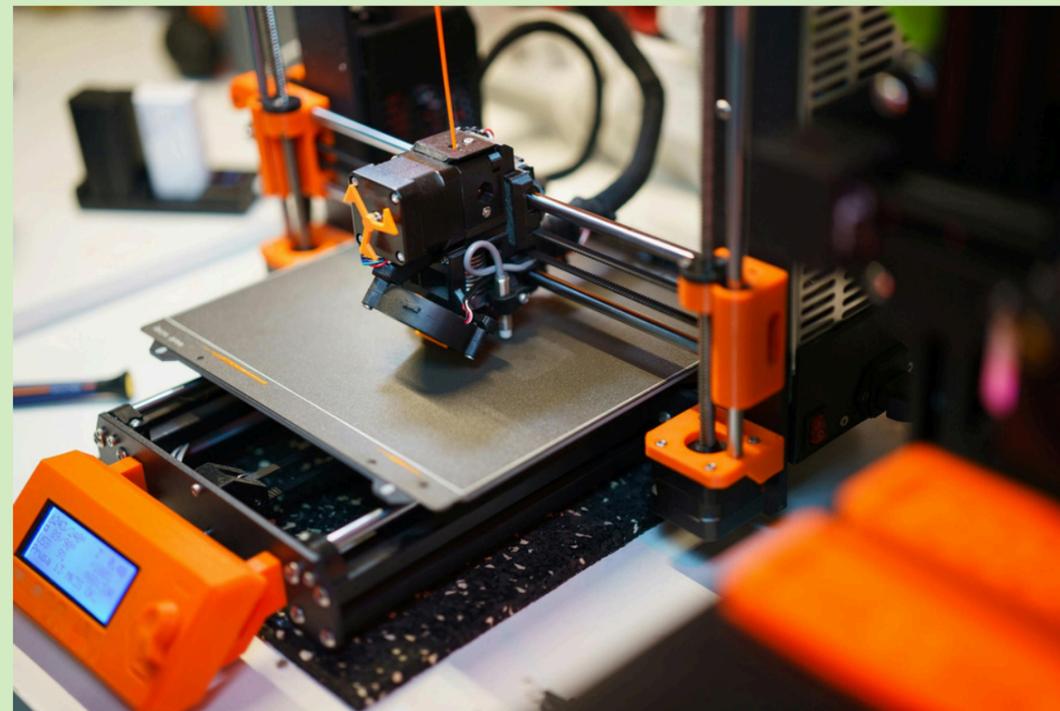
Course Objectives

- By the end of this session you will:
- Understand 3D modeling and printing basics
- Create your own simple 3D model in Tinkercad
- Learn how to prepare a file for 3D printing
- Experience a live printing demonstration

What is 3D Modeling?

- 3D modeling is the process of creating a digital representation of an object.

It is used in engineering, design, education, and entertainment.



Why 3D Printing Matters

- 3D printing allows rapid prototyping and creativity.
- It helps students turn ideas into real objects.
- It is part of Industry 4.0 and STEAM education.

How a 3D Printer Works

- 1. Design the object (CAD)
- 2. Slice into layers using software
- 3. Print layer by layer with melted filament
- 4. Final 3D object appears!

Types of 3D Printers

- FDM: melts plastic filament (most common)
- SLA: uses liquid resin and laser
- SLS: uses powdered material and laser sintering

Common Materials

- PLA - easy to print, eco-friendly
- ABS - strong, heat resistant
- PETG - flexible and durable
- Resin - smooth surface, detailed prints

Introduction to Tinkercad

- Tinkercad is a free online 3D design tool by Autodesk.
- You can combine basic shapes to build anything.
- Sign in at www.tinkercad.com

Let's design a simple keychain:

1. Add a box shape
2. Resize and add text
3. Group the shapes
4. Export as .STL

Slicing the Model

- Use slicing software (like Cura or PrusaSlicer)
- Adjust settings: Layer height, Infill density, Supports and adhesion

Export to G-code for the printer.

Printing Process Demo

- 1. Insert SD card or USB
- 2. Load the file
- 3. Start printing
- 4. Observe layer-by-layer process

Problem: Warping → Use glue or heat bed

Problem: Poor adhesion → Level the bed

Problem: Scaling → Check units before exporting

Erasmus+ Collaboration



In this project we collaborate across Europe to share skills and ideas. 3D modeling helps us build creativity and innovation together.

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