Introduction to 3D Printing

COURSE OUTLINE

Course Description

This hands-on course introduces students to the fundamentals and practical applications of 3D printing, with a primary focus on Fused Deposition Modeling (FDM) technology. Students will gain an understanding of printer mechanics, materials, and troubleshooting techniques, while also exploring the advantages and limitations of additive manufacturing. By the end of the course, each student will complete a start-to-finish 3D printing project that demonstrates their knowledge and skills.

01 Introduction to 3D Printing
- Brief history
- Additive manufacturing vs. traditional manufacturing

02 Types of 3D Printing
- Material Extrusion (FLA)
- Vat Polymerization (SLA)
- Powder Bed Fusion (SLS)
- Other Types

03 Understanding FDM Technology
- How FDM printers work
- Major components of an FDM printer
- FDM companies and machines

04 Materials and Filament Types
- PLA, ABS, PETG, TPU, and other filaments
- Strengths, weaknesses, and ideal use cases for each material
- Storage and handling of filament

05 Obtaining Printable Models
- Custom models using CAD
- Websites with free models

06 Slicer Software
- Common slicer software
- Hands-on: process of using a slicer from start to finish

07 Printing an Object
- Loading filament
- Troubleshooting (adhesion, stringing, warping, surface quality, etc)
- Hands-on: print a Benchy

08 Questions & Comments