

3D PRINTING AND DESIGN



ESTD : 1880

ST ALOYSIUS COLLEGE
(AUTONOMOUS)
MANGALURU

DEPARTMENT OF PHYSICS

30 HRS ONLINE COURSE
BEGINS ON
21 FEBRUARY, 2024

LIMITED SLOTS AVAILABLE

Kindly register by 20th February,
2024 through the link below.

<https://sac-elearning.com/courses/3d-printing-and-design/>



Mr Shawn Ajay Dsouza
Instructor

Rev. Dr Praveen Martis S. J.
Principal

3D PRINTING AND DESIGN

(Certificate course)

SYLLABUS

MODULE 1

INTRODUCTION TO 3D PRINTING TECHNOLOGY

Origin of 3D printing, Types of 3D printing, Use of various materials, PLA and ABS Filament, Technological leaps in additive manufacture, Fused Deposition Modelling.

TINKERCAD WORKSPACE

Setting up TINKERCAD account, Adding new designs, Gallery, Featured shapes, Workspace orientation, Shape Orientation, Pan and zoom, Scale and Resize objects, Solid and Hole Features.

RULER AND ALIGNMENT

Using the Ruler to measure dimensions, Calculating height and separation from an object, Aligning objects using alignment dots, Relative alignment.

GROUP AND DUPLICATE

Using the group function to merge shapes, Creating hollow spaces in objects, Duplicate custom shapes to generate design patterns, Making a gear head.

EXPORT AND IMPORT

Exporting .stl (Stereolithography) files, Slicing, Importing image and 3D designs, Exploring Thingiverse, Creating a chimera using the import feature, Creating a logo using Inkscape.

ESSENTIAL FEATURES

Basic shapes, Texts and Numbers, Characters, Connectors, Featured Shape generators, Your shape generators.

CODEBLOCKS

Learning to program using CODEBLOCKS, Exploring Shapes, Modify, Control, Math, Data and Mark Up Editing the dimensions and merging shapes, Creating a table.

MODULE 2

ORGANIC SHAPES

Using the Extrusion shape generator, Creating complex shapes using nodes and handle bars, Creating a standard thread die.

SLICER SOFTWARE

CURA Workspace, Selecting your 3D printer, Print bed surface, Layer Height, Shell thickness, Bed and Nozzle Temperature, Infill structure and percentage, Build plate adhesion, Support structure and overhangs.

3D PRINTER PARTS

Creality Ender 3, Computerized Numeric Control, G-Code, Motherboard, Stepper motors, Timing belt and Pulley, V Slot Aluminium Extrusion, Threaded Rod, Build plate, Bed Levelling, Feeder assembly, Bowden Extruder, SMPS.

3D PRINTING BEST PRACTICES

Overhangs, bridging, Wall thickness, Orientation, Tolerance, Engrave and Emboss, Bed Adhesion, Fillets, Sharp and narrow points, Respecting your 3D printer.

References:

- Make: 3D Printing by Anna Kaziunas France published by Maker Media, Inc.
- Make: Design for 3D Printing by Samuel N. Bernier, Bertier Luyt and Tatiana Reinhard published by Maker Media, Inc.
- Make: 3D Printing Projects by Brook Drumm and James Floyd Kelly published by Maker Media, Inc.