

3-D Printing

B2-C1

Module 10

Summary

Here's What
We Will Be
Learning in this
Presentation:



- ❑ What is 3D printing?
- ❑ History of 3D printing.
- ❑ Working of 3D printing.
- ❑ 3 D scanners.
- ❑ Application, services and future of 3D printing.
- ❑ Exercises.

Vocabulary

Palaeontology : a science dealing with the life of past geological periods as known from fossil remains.

Prototyping: an original model on which something is patterned.

Successive: following in order : following each other without interruption .

Maquettes: a usually small preliminary model (as of a sculpture or a building).

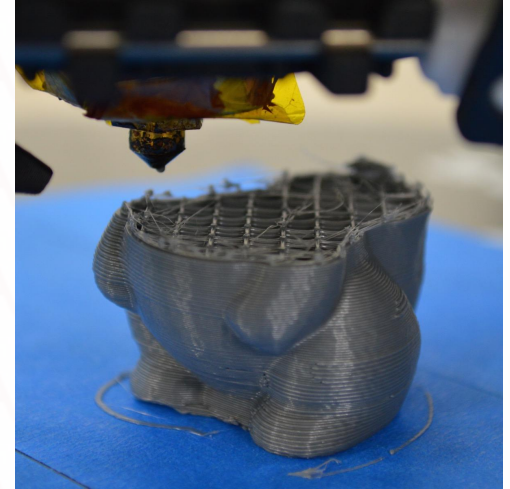
Prosthetics: an artificial device to replace or augment a missing or impaired part of the body.

What is 3D printing?

3D printing or additive manufacturing is a process of making three dimensional solid objects from a digital file.

The creation of a 3D printed object is achieved using additive processes.

In an additive process an object is created by laying down **successive** layers of material until the object is created. Each of these layers can be seen as a thin sliced horizontal cross-section of the eventual object.

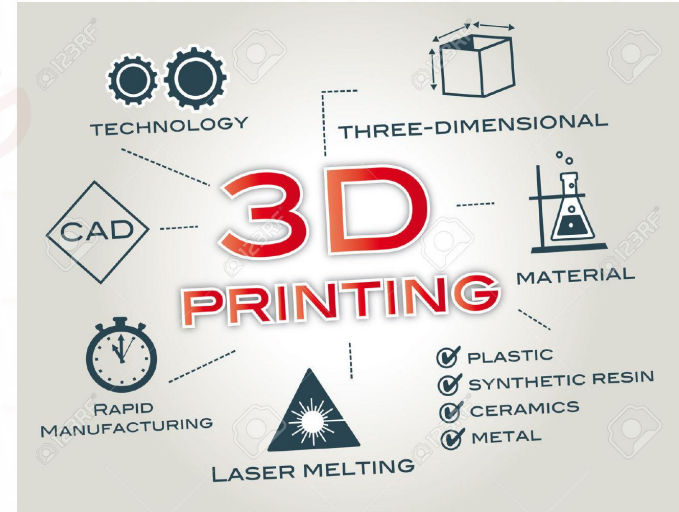


How does 3D Printing Work?

It all starts with making a virtual design of the object you want to create.

This virtual design is, for instance, a CAD (Computer Aided Design) file. This CAD file is created using a 3D modelling application or with a 3D scanner (to copy an existing object).

A 3D scanner can make a 3D digital copy of an object.



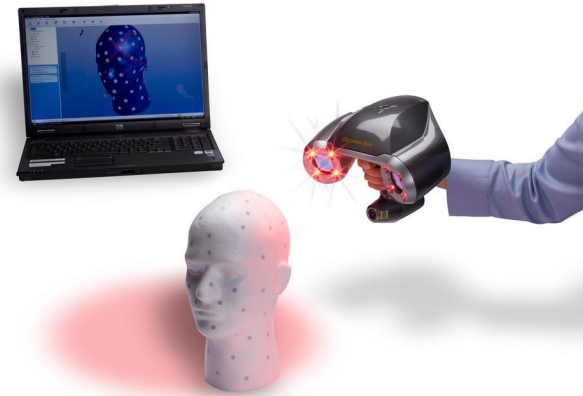
3D Scanners

3D scanners use different technologies to generate a 3D model.

Examples are time-of-flight, structured/modulated light, volumetric scanning and many more.

In the near future, digitising real objects into 3D models will become as easy as taking a picture.

Future versions of smartphones will probably have integrated 3D scanners.



Applications of 3D printing

Applications include:

- ❖ Rapid prototyping.
- ❖ Architectural scale models & **maquettes**.
- ❖ Healthcare (3D printed **prosthetics** and 3D printing with human tissue) and entertainment (e.g. movie props).
- ❖ Reconstructing fossils in **palaeontology**, replicating ancient artefacts in archaeology.
- ❖ Reconstructing bones and body parts in forensic pathology and reconstructing heavily damaged evidence acquired from crime scene investigations.

Services

Not everybody can afford or is willing to buy their own 3D printer. Does this mean you cannot enjoy the possibilities of 3D printing? No, not to worry.

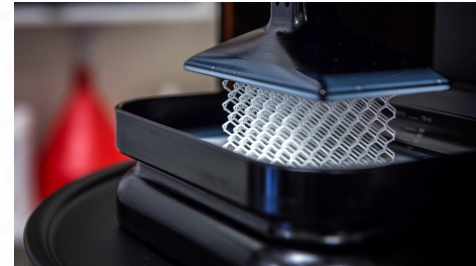
There are 3D printing service bureaus that can inexpensively print and deliver an object from a digital file that you simply upload to their website. You can even sell your 3D designs on their website and make a little money out of it!

There are services where you can send your digital model to and they print the building on scale for you to use in client presentations. These kind of services can already be found in a lot of different industries like dental, medical, entertainment and art.

Future

It is predicted by some additive manufacturing advocates that this technological development will change the nature of commerce, because end users will be able to do much of their own manufacturing rather than engaging in trade to buy products from other people and corporations.

With effects on energy use, waste reduction, customization, product availability, medicine, art, construction and sciences, 3D printing will change the manufacturing world as we know it.



Exercise 1

Answer the following question:

1. What is 3D printing?
2. Given a chance, what would you like to create using a 3D printer?
3. How does 3D printing work?
4. What are 3D scanners?
5. How 3D printing services work?

Exercise 2

Give meaning of the following:

1. Successive
2. Prosthetics
3. Maquettes
4. Palaeontology
5. Prototyping

Exercise 3

Name any one application of 3D printing.

Exercise 2

Answer the following question:

1. What do you think about 3D printing? Discuss with the trainer.
2. Given a chance, what would you like to create using a 3D printer?
3. Do you really think 3D printing can change the manufacturing field? State your reasons.
4. Name any two applications of 3D printing.