

Encode IT

E-Newsletter

Vision:

To be a pre-eminent information technology programme that empowers girls to meet the dynamic demands of Industry & society.

Mission:

- To provide quality education with best resources to achieve academic excellence.
- To create favorable environment that inculcate self learning, soft skill and adaptability to latest technology.
- To develop competent professionals having highest ethical values and commitment towards the society.

Message from Head of Department

Dear students, colleagues and alumni

I am very happy that our Information Technology department is releasing 4th issue of volume: 4, quarterly e-news letter "Encode IT" where we are sharing some of the important news over the past three months. I take this opportunity to thank our staff editorial team for their great effort to make this news letter. I also invite the readers of 'Encode IT' for their contribution and suggestions for the forthcoming issues.

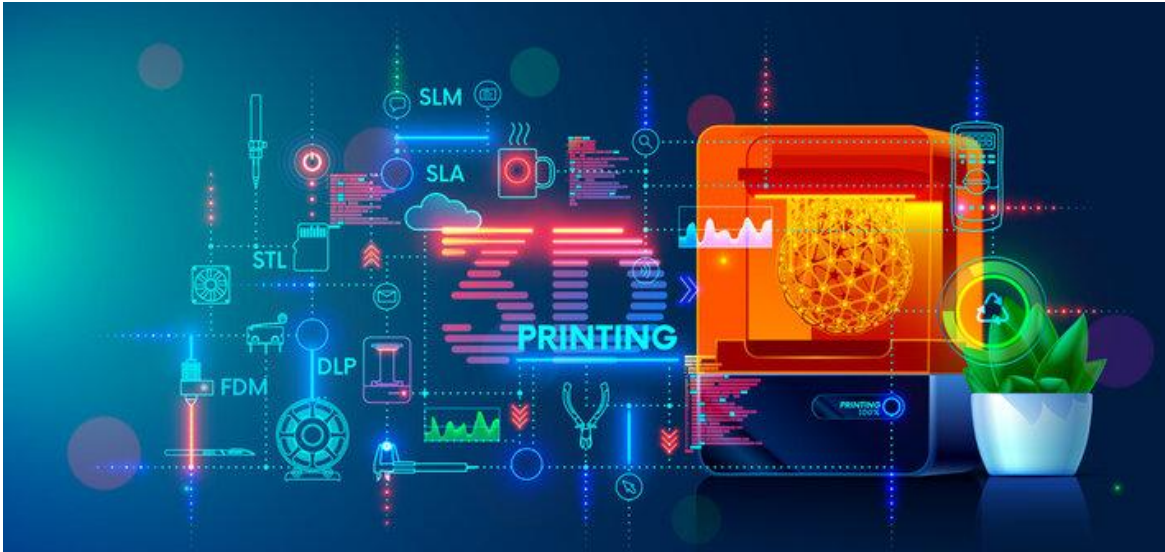
Year 2022 is about to end and we are standing on the door step of 2023. I convey my best wishes to the students of our department for the same. We hope to keep excelling and maintain our position in academics.

Good Luck.



Mrs. Jigna J Desai
Head of Department,
Information
Technology
Department

3D Printing



Mr. Rajesh I. Pradhan
Lecturer,
Department of
Information
Technology

What is 3D Printing?

3D printing, also known as additive manufacturing, is a process in which a digital file is used to create a three-dimensional solid object. In the 3D printing process, sequential layers of material are laid down by the '3D printer' until object creation is completed.

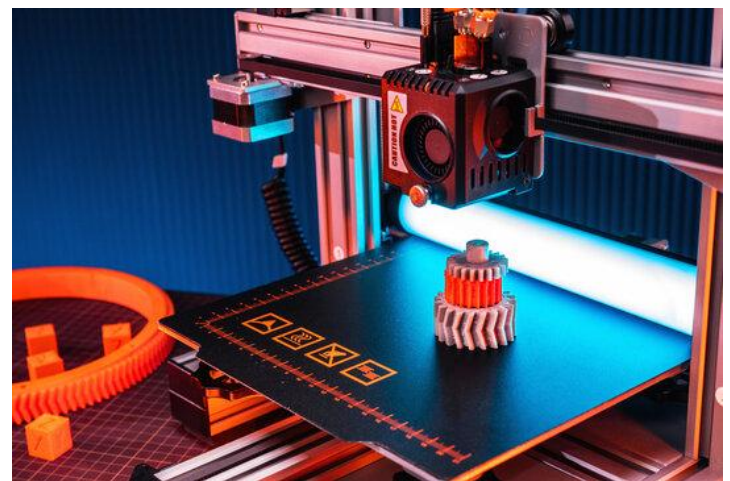
3D-printed objects are created through an additive process, where the printer places layer after layer of material until the desired thing is 'printed'. Each layer can be considered a finely sliced cross-section of the printed item. With 3D printing, users can produce complicated shapes without consuming as much material as traditional manufacturing methods require.

The operation style of 3D printing is the opposite of 'subtractive manufacturing', where the material is cut out or hollowed using equipment such as a milling machine. Conversely, additive manufacturing does not need a mold or material block to create physical objects. Instead, it stacks layers of material and fuses them together.

3D printing offers swift product creation, low expenses for the initial fixed infrastructure, and the

ability to create complicated geometries using several material types, something traditional manufacturing solutions might not be capable of as efficiently.

How Does 3D Printing Work?



3D printing is part of the additive manufacturing family and uses similar methods to a traditional inkjet printer — albeit in 3D. Additive manufacturing describes the process of creating something in layers, adding material continuously until the final design is complete. This term most often refers to molding and 3D printing.

It takes a combination of top-of-the-line software, powder-like materials and precision tools to create a three-dimensional object from scratch. Below are a few of the main steps 3D printers take to bring ideas to life.

3D Modeling Software

The first step of any 3D printing process is 3D modeling. To maximize precision — and because 3D printers can't magically guess what you want to print — all objects have to be designed in a 3D modeling software. Some designs are too intricate and detailed for traditional manufacturing methods. That's where CAD software comes in.

Modeling allows printers to customize their product down to the tiniest detail. The 3D modeling software's ability to allow for precision designs is why 3D printing is being hailed as a true game changer in many industries. This modeling software is especially important to an industry, like dentistry, where labs are using 3D software to design teeth aligners that precisely fit to the individual. It's also vital to the space industry, where they use the software to design some of the most intricate parts of a rocketship.

Slicing the Model

Once a model is created, it's time to "slice" it. Since 3D printers cannot conceptualize the concept of three dimensions, like humans, engineers need to slice the model into layers in order for the printer to create the final product.

Slicing software takes scans of each layer of a model and will tell the printer how to move in order to recreate that layer. Slicers also tell 3D printers where to "fill" a model. This fill gives a 3D printed object internal lattices and columns that help shape and strengthen the object. Once the model is sliced, it's sent off to the 3D printer for the actual printing process.

The 3D Printing Process

When the modeling and slicing of a 3D object is completed, it's time for the 3D printer to finally take over. The printer acts generally the same as a traditional inkjet printer in the direct 3D printing process, where a nozzle moves back and forth while dispensing a wax or plastic-like polymer layer-by-layer, waiting for that layer to dry, then adding the next level. It essentially adds hundreds or thousands of 2D prints on top of one another to make a three-dimensional object.

3D Printing Materials

There are a variety of different materials that a printer uses in order to recreate an object to the best of its abilities. Here are some examples:

Acrylonitrile Butadiene Styrene (ABS)

Plastic material that is easy to shape and tough to break. The same material that LEGOs are made out of.

Carbon Fiber Filaments

Carbon fiber is used to create objects that need to be strong, but also extremely lightweight.

Conductive Filaments

These printable materials are still in the experimental stage and can be used for printing electric circuits without the need for wires. This is a useful material for wearable technology.

Flexible Filaments

Flexible filaments produce prints that are bendable, yet tough. These materials can be used to print anything from wristwatches to phone covers.

Metal Filament

Metal filaments are made of finely ground metals and polymer glue. They can come in steel, brass, bronze and copper in order to get the true look and feel of a metal object.

Wood Filament

These filaments contain finely ground wood powder mixed with polymer glue. These are

obviously used to print wooden-looking objects and can look like a lighter or darker wood depending on the temperature of the printer.

The 3D printing process takes anywhere from a few hours for really simple prints, like a box or a ball, to days or weeks for much larger detailed projects, like a full-sized home.

3D Printing Processes and Techniques

here are also different types of 3D printers depending on the size, detail and scope of a project. Each different type of printer will vary slightly on how an object gets printed.

Fused Deposition Modeling (FDM)

FDM is probably the most widely used form of 3D printing. It's incredibly useful for manufacturing prototypes and models with plastic.

Stereolithography (SLA) Technology

SLA is a fast prototyping printing type that is best suited for printing in intricate detail. The printer uses an ultraviolet laser to craft the objects within hours.

Digital Light Processing (DLP)

DLP is one of the oldest forms of 3D printing. DLP uses lamps to produce prints at higher speeds than SLA printing because the layers dry in seconds.

Continuous Liquid Interface Production (CLIP)

CLIP is amongst the faster processes that use Vat Photopolymerisation. The CLIP process utilizes Digital Light Synthesis technology to project a sequence of UV images across a cross-section of a 3D printed part, resulting in a precisely controlled curing process. The part is then baked in a thermal bath or oven, causing several chemical reactions that allow the part to harden.

Material Jetting

Material Jetting applies droplets of material through a small diameter nozzle layer-by-layer to

build a platform, which becomes hardened by UV light.

Binder Jetting

Binder Jetting utilizes a powder base material layered evenly along with a liquid binder, which is applied through jet nozzles to act as an adhesive for the powder particles.

Fused Deposition Modeling (FDM)

FDM, also known as Fused Filament Fabrication (FFF), works by unwinding a plastic filament from a spool and flowing through a heated nozzle in horizontal and vertical directions, forming the object immediately as the melted material hardens.

Selective Laser Sintering (SLS)

A form of Powder Bed Fusion, SLS fuses small particles of powder together by use of a high-power laser to create a three-dimensional shape. The laser scans each layer on a powder bed and selectively fuses them, then lowering the powder bed by one thickness and repeating the process through completion.

Multi-Jet Fusion (MJF)

Another form of Powder Bed Fusion, MJF uses a sweeping arm to deposit powder and an inkjet-equipped arm to apply binder selectively on top. Next, a detailing agent is applied around the detailing agent for precision. Finally, thermal energy is applied to cause a chemical reaction. Direct Metal Laser Sintering (DMLS) also utilizes this same process but with metal powder specifically.

Sheet Lamination

Sheet Lamination binds material in sheets through external force and welds them together through layered ultrasonic welding. The sheets are then milled in a CNC machine to form the object's shape.

Directed Energy Deposition

Directed Energy Deposition is common in the metal industry and operates by a 3D printing apparatus

attached to a multi-axis robotic arm with a nozzle for applying metal powder. The powder is applied to a surface and energy source, which then melts the material to form a solid object.

What Are 3D Printers?

In short, 3D printers use CAD to create 3D objects from a variety of materials, like molten plastic or powders. 3D printers can come in a variety of shapes and sizes ranging from equipment that can fit on a desk to large construction models used in the making of 3D-printed houses. There are three main types of 3D printers and each uses a slightly different method.

3D printers aren't like those magical boxes in sci-fi shows. Rather, the printers — which act somewhat similarly to traditional 2D inkjet printers — use a layering method to create the desired object. They work from the ground up and pile on layer after layer until the object looks exactly like it was envisioned.

Why Are 3D Printers Important to the Future?

The flexibility, accuracy and speed of 3D printers make them a promising tool for the future of manufacturing. Today, many 3D printers are used for what is called rapid prototyping.

Companies all over the world now employ 3D printers to create their prototypes in a matter of hours, instead of wasting months of time and potentially millions of dollars in research and development. In fact, some businesses claim that 3D printers make the prototyping process 10 times faster and five times cheaper than the normal R&D processes.

3D printers can fill a role in virtually almost every industry. They're not just being used for prototyping. Many 3D printers are being tasked with printing finished products. The construction industry is actually using this futuristic printing

method to print complete homes. Schools all over the world are using 3D printers to bring hands-on learning to the classroom by and robotics pieces. The flexibility and adaptability of three-dimensional printing of 3D printing technology makes it a game-changer for any industry.

Advantages and Disadvantages of 3D Printing

Advantages of 3D Printing

3D Printers Are Affordable

3D printing is capable of making the manufacturing process of complex parts more streamlined thanks to software programming. This often means it is a more affordable option in some industries.

Other factors that contribute to the affordability of 3D printing are the materials used. 3D printing can utilize low-cost plastics and concrete that are easily accessible. Also, because there is no need for a mold in 3D printing, that's another cost taken off the table.

3D Printers Are Fast

3D printing is ideal for quick prototyping of products because it can be done in house in small runs. This allows manufacturers to work out bugs and make changes to products faster than a typical production process. Alterations to products can easily be made through CAD while the manufacturing cost stays the same.

3D Printers Can Work With Speciality Materials

Despite plastics and metals being commonly used in the 3D printing industry, there are a host of other options to choose from. The advantage means speciality parts and products can be made with specific materials like water-absorbing plastic, nitinol, gold and carbon fiber. Speciality materials

like this allow for properties such as high heat resistance, water repellency and strength.

Disadvantages of 3D Printing

3D Printers May Not Provide Enough Strength

A downside to building an object up layer by layer, is that this can affect the durability and strength of the object. Of course, the strength of 3D printing relies heavily on what materials are used; metals and concrete will always be some of the strongest materials used in 3D printing.

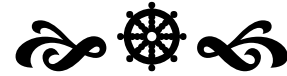
3D Printers May Have Accuracy Issues

Although CAD is often an accessible and accurate way to design, there can be errors. Accuracy with 3D printing is dependent on the techniques and printers use. For example, some smaller 3D printers, like desktop models, can wear out easily. This means that as the production of a design goes on, the products made later on may vary from the first batch.

References:

<https://www.spiceworks.com/tech/devops/articles/what-is-3d-printing/>

<https://builtin.com/3d-printing>



Toppers of 2nd Semester



TOPPERS OF 2ND SEMESTER

1



DAMASIYA RIDDHI K.

SPI : 9.86

2



DOBARIYA DHRUTI A.

SPI : 9.68

2



PATEL KASHISH B.

SPI : 9.68

3



CHOTALIYA SHIVANGI A.

SPI : 9.32

Congratulations to all the students for achieving wonderful results. In the Second Semester Examination...

Keep up the good work!!!

Happy Children's Day

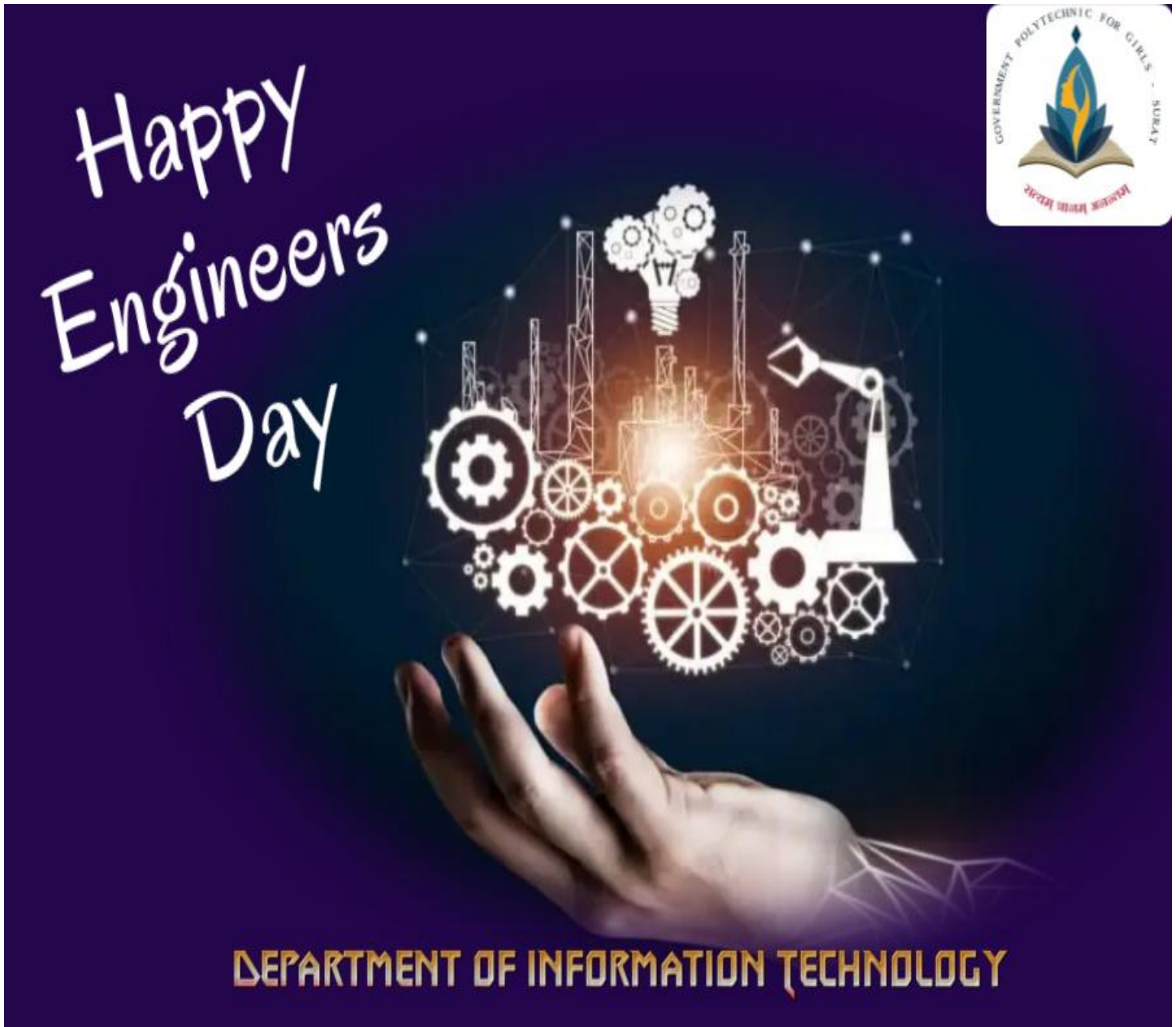


DEPARTMENT OF INFORMATION TECHNOLOGY



www.facebook.com/DITGPGS

May the innocence in their smiles and the purity of their hearts stay forever unfaded. Wishing a joyful Children's Day to every kid in the world!!!!



Engineers are amazing people with extraordinary skills!
Thank you, engineers, for making our lives simpler and smarter!
Happy Engineer's Day !!!

Information Technology Orientation Programme-2022



Information Technology
ORIENTATION PROGRAMME-2022

Government Polytechnic for Girls, Surat Warmly welcomes the newcomer students of IT Department in Orientation ceremony hosted by Department of IT Faculty where You will Get: Quality Education Skills with Creative Thinking Interaction with High Qualified Faculties..

DATE:
17/09/2022
TIME: 11:00 AM
VENUE: A-104

Made with PosterMyWagon Follow us on www.facebook.com/DITGPGS 

Orientation Program has been organized for first semester students of IT Department on 17th of September 2022.

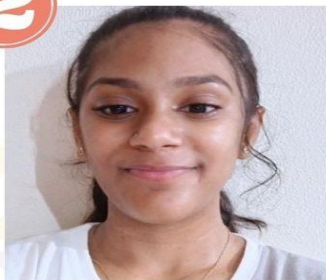


TOPPERS OF 4TH SEMESTER



SHAH FORAM SANCHESHKUMAR

SPI : 10.00



**SAVALIYA SNEHA
HITESHBHAI**

SPI : 9.56



SUPE PAYAL ANIL

SPI : 9.38

Congratulations to all the Second year students for achieving wonderful results...

Wish you all the very best for your future endeavors!!!

End Semester Exam: Summer -2022 (Top 3 students)

Sr.no.	Enrollment No.	Name Of Student	Rank	Semester	SPI
1	206150316053	SHAH FORAM SANCHESHKUMAR	1	4	10
2	206150316059	SAVALIYA SNEHA HITESHBHAI	2	4	9.56
3	206150316033	SUPE PAYAL ANIL	3	4	9.38

Sr.no.	Enrollment No.	Name Of Student	Rank	Semester	SPI
1	216150316010	DAMASIYA RIDDHI K	1	2	9.86
2	216150316021	DOBARIYA DHRUTI A	2	2	9.68
3	216150316047	PATEL KASHISH B	2	2	9.68
4	216150316036	CHOTALIYA SHIVANGI	3	2	9.32

Puzzles

1. The sum of ages of 5 children born at the intervals of 3 years each is 50 years. What is the age of the youngest child?
2. The banker's gain on a sum due 3 years hence at 12% per annum is Rs. 270. The banker's discount is:
3. A clock is started at noon. By 10 minutes past 5, the hour hand has turned through:

Previous Newsletter's Puzzles Answers

Q1: Wednesday

Q2: 25%

Q3: 25 per min

STUDENT'S LIFE

A student
What does it mean to be one
Books and exams
Is that all there is to it hun?
No, replied the wise man
For, with a smile, he said
We are all students
Till the time we're dead
Metaphorical, may this story be
But his word can't be true
Nothing can stop you in life
As long as you are a learner.



Solanki Azima
Sem: 5th
En.No.-
206150316063
Department of
Information
Technology



Vishwa Desai
Sem: 5th
En.No.-
206150316061
Department of
Information
Technology