Design Modeling using SaaS Platform: Onshape

The Robotics Society (TRS) Student Chapter, BVM has successfully completed 4 days of online lecture series titled “Design Modelling using SAAS Platform - Onshape” which was scheduled from 27th January 2021 to 30th January 2021.
About 200 students amongst all the levels and disciplines of the institute participated and benefited by the series of lectures through MS Team Live interaction online platform.

A very welcoming gesture was shown by Dr P. M. George, Head of the Mechanical Department who also introduced everyone to the session, praised the initiatives taken by TRS in the past as well as taking in the present. He also appreciated the rapid growth of the Student Chapter, achievements and work carried out by the students were very well recognized.

Following which, Dr Dipak M. Patel, faculty advisor, TRS Student Chapter, BVM & Professor, Electronics Engineering Department briefed about TRS and activities conducted under it. Next, Dr I. N. Patel, Principal, BVM expressed his regards and emphasised on adapting to the new normal and how TRS is helping students grow intellectually, gain credibility and taking stands in the era of eternal competition.

Vote of thanks was given by Prof V R Singh, Mechanical Engineering Department who expressed his gratitude towards all respected faculty members and everyone who joined the session.

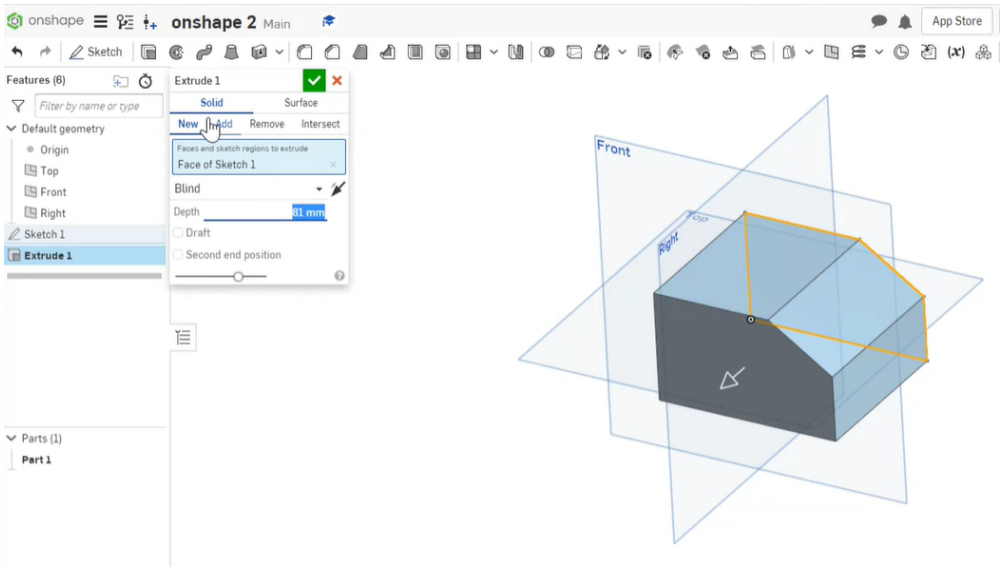
Day 1:
He handed over the session to the subject Expert Prof J R Koisha who took the lead and started with technical prerequisites for the lecture. He discussed the importance of computer-based designing of machine parts and how it is revolutionising the fast-growing world of design.
After an introduction to the session, Prof J R Koisha sir headed the session by introducing us to the interface and various features provided by Onshape. SAAS stands for Software-as-a-Service, and Onshape provides a real-time cloud platform to share your files across the globe anywhere, anytime, to anyone willing to use it.
Main topics of discussion were:

1. What is Onshape?
2. Why is Onshape widely used?
3. Sketch
4. Line
5. Constrains
6. Parameters

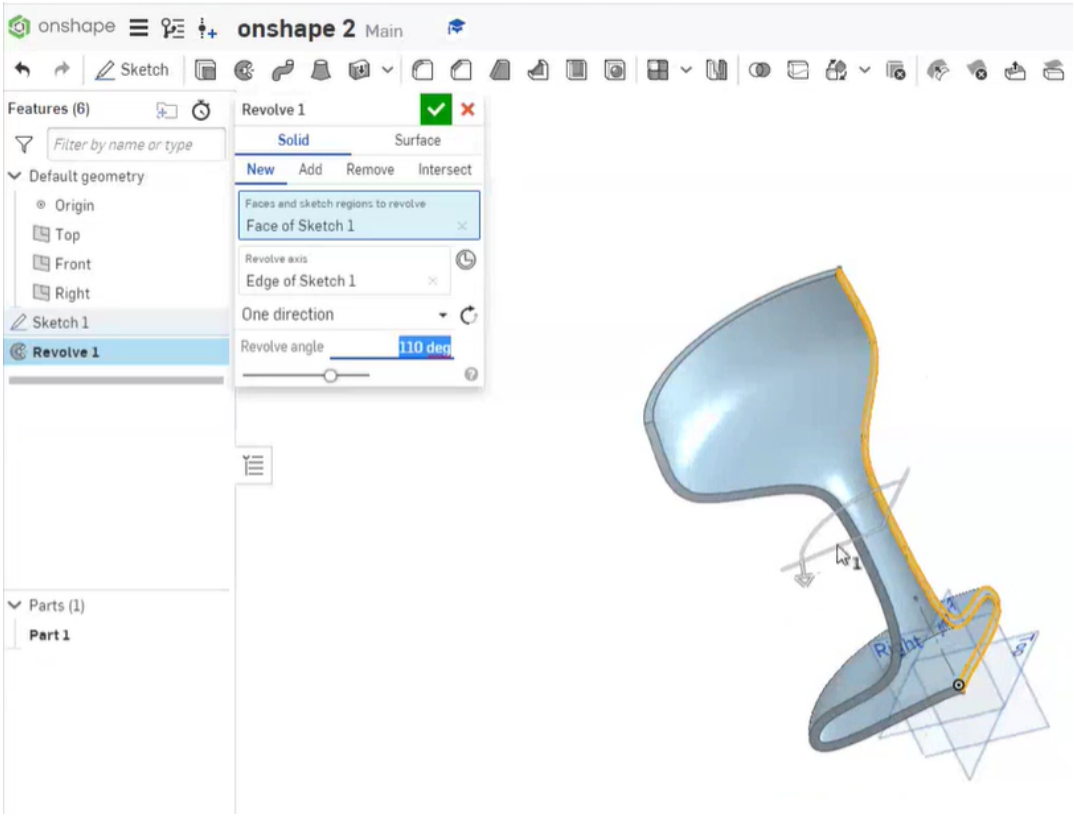
At the end of the session, sir provided an assignment to be finished by next day’s session in order to keep up with the series.

Day 2:
On this day, a session expert introduced us to the cloud advantage provided on Onshape by syncing the files from his desktop device to his personal mobile. He could differentiate the view offered by the software as well as the mobile application to show the change of interface. He also displayed how easy 3D modelling can be even while commuting through the workplace. Later on for the ease of the session, he switched to his desktop device. Glad to say, everyone did their homework as instructed and were enthusiastic regarding new concepts.
Topics of discussed were:

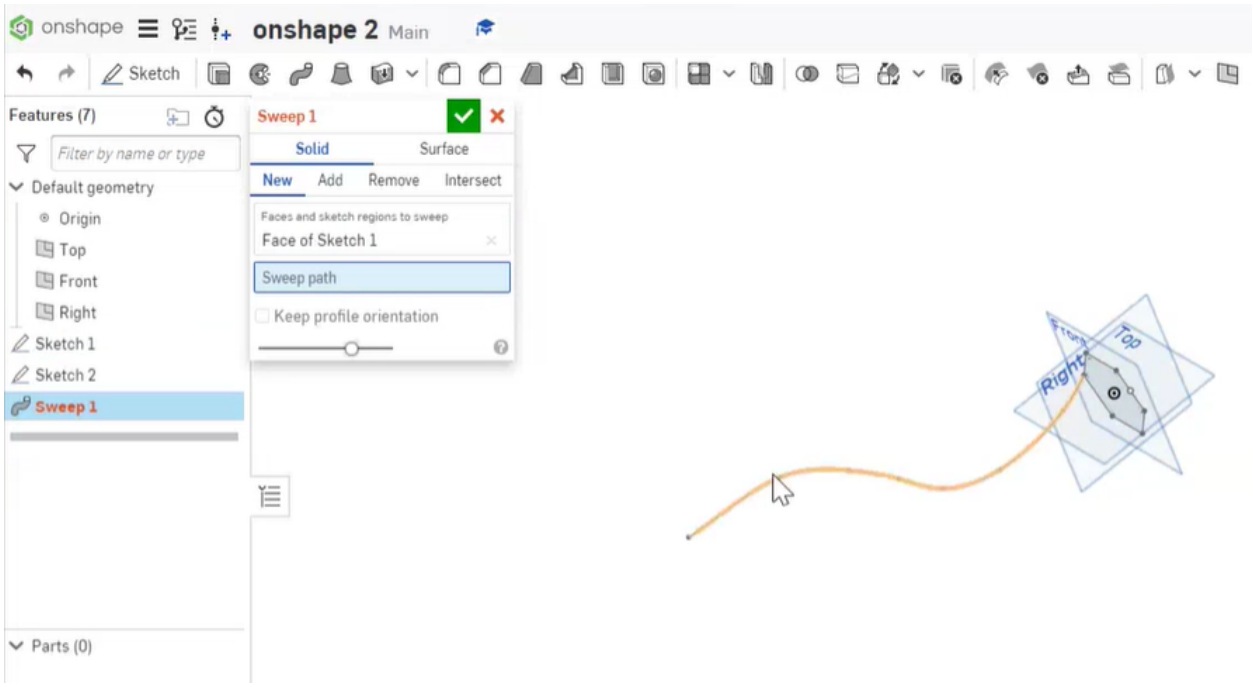
1. Extrude
   This feature adds depth to a sketch along a straight path. Create a new part or surface or modify an existing one by adding or removing material, or intersecting parts in its path.



2. Revolve
   Create, add to, subtract from, or intersect parts by revolving sketch regions or planar faces about a central axis, or surfaces by revolving lines and curves about a central axis.



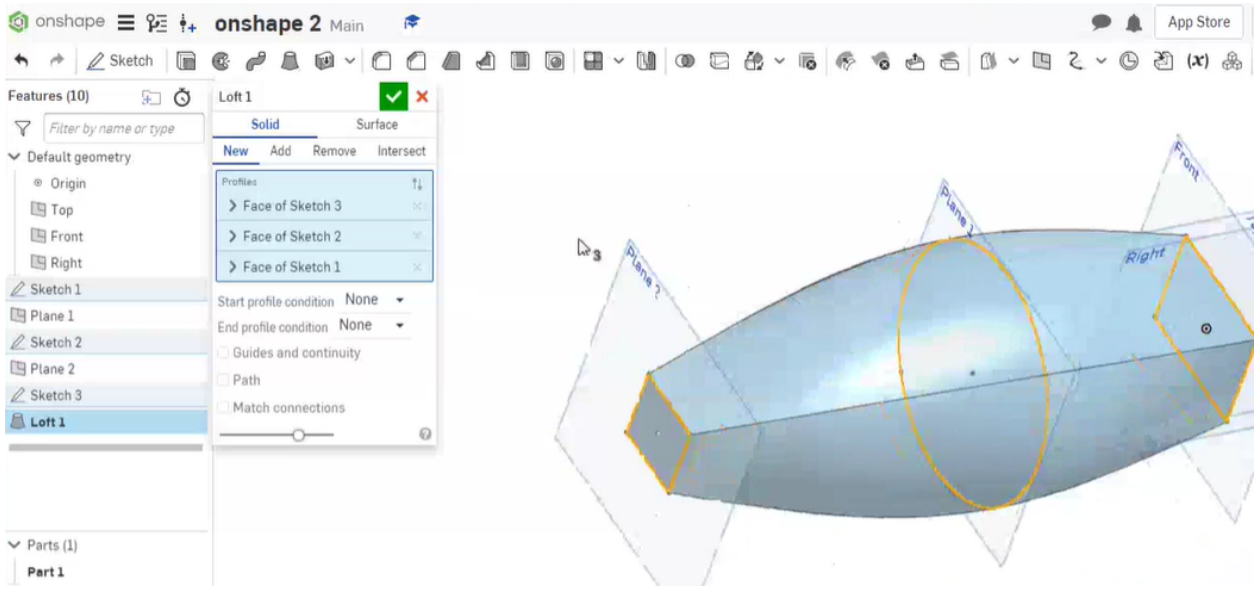
3. Sweep
   Define a shape using a selected region, curves, or planar face moving along a path (either solid or surface). Create a new part or modify an existing one by adding or removing material, or intersecting parts in its path.



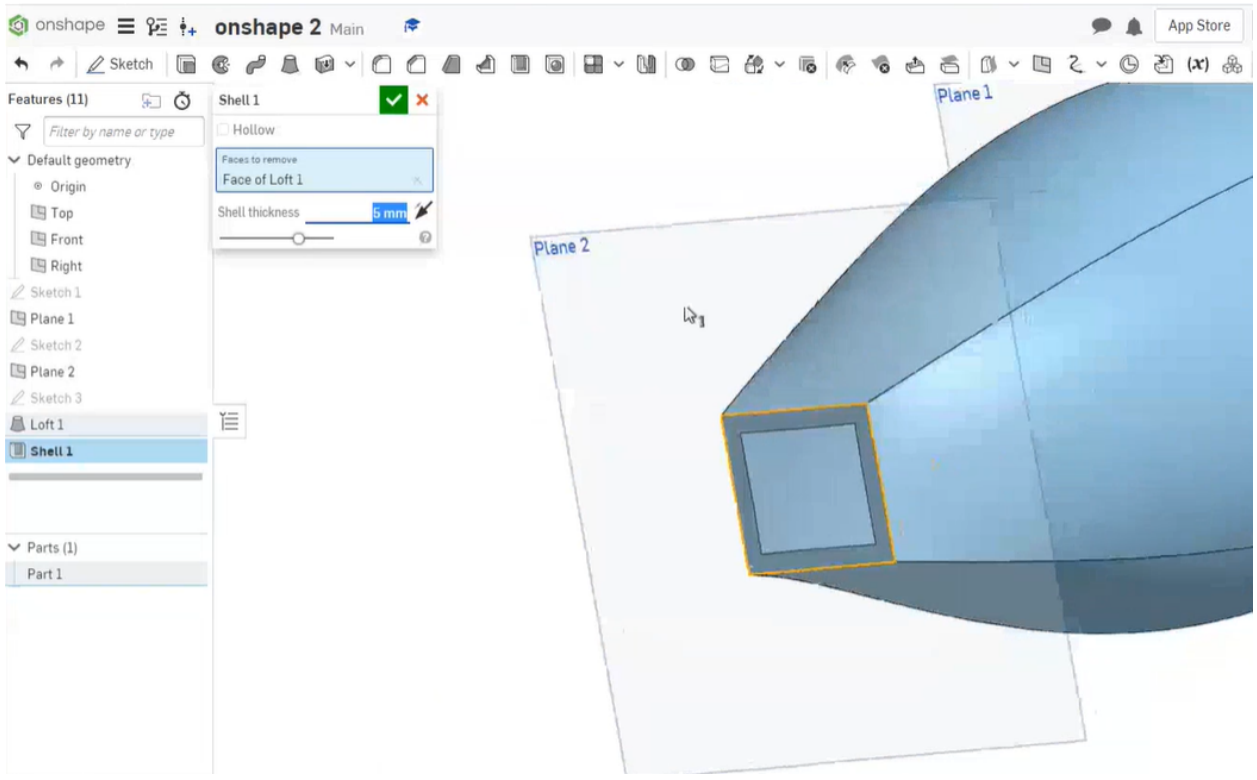
4. Plane

Create a new construction plane.

5. Loft
   Use profiles (sketch regions or sketch curves) and optional guide curves to define shapes that smoothly transition between them. Create parts or surfaces or modify existing parts or surfaces.



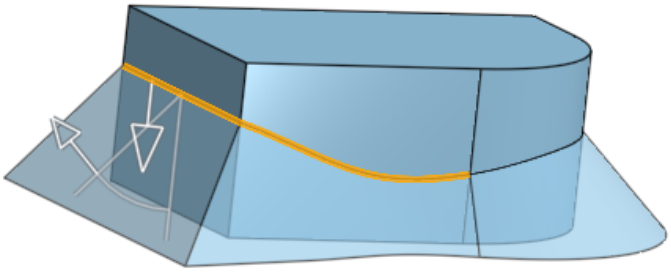
6. Shell
   Remove material from a part to produce a cavity of constant wall thickness with the option to remove zero faces (hollow) to many faces of the part (shell).



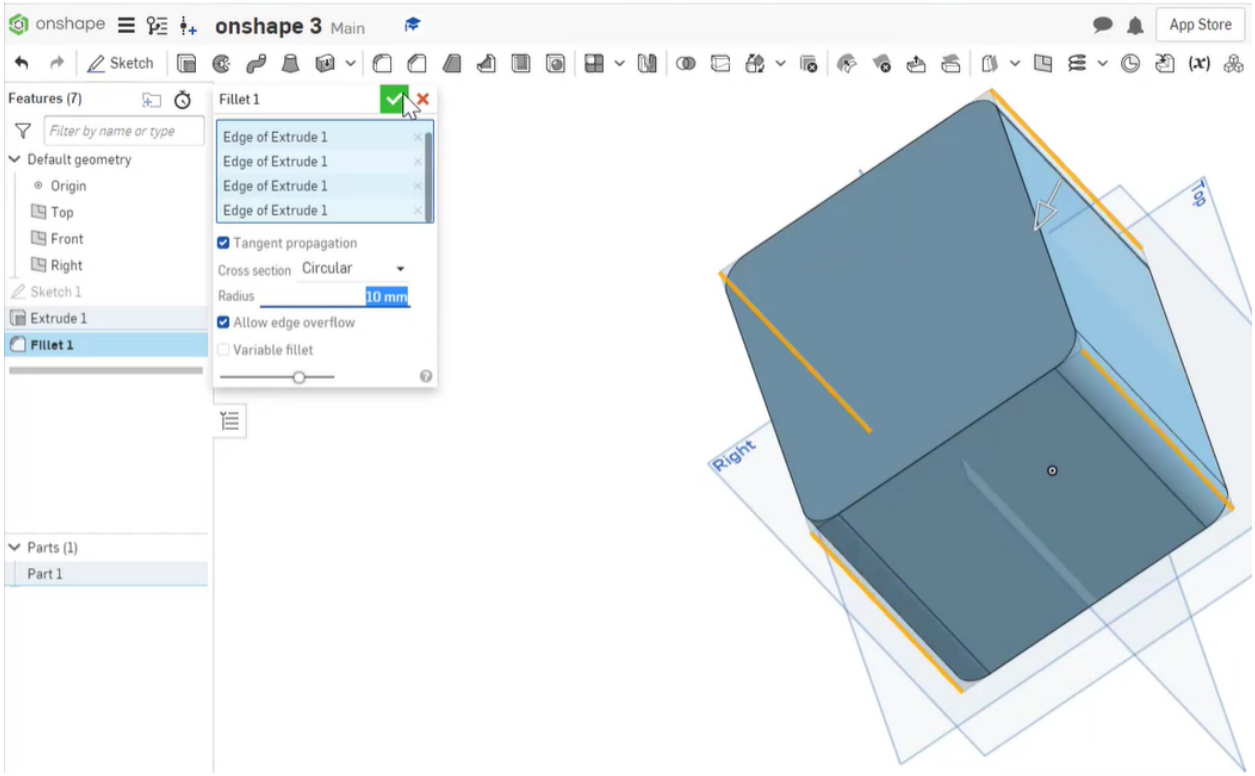
Day 3:
Sir talked about the importance of real-time collaboration amongst the team members in order to work efficiently in any organisation. In a world filled with challenges how teams can tackle their problems easily and efficiently using software which is available to them all the time and can access remotely.

Topics covered in detail on this day:

1. Draft
   Apply a taper to one or more selected faces, or a parting line, in order to facilitate pulling a part from a mold.

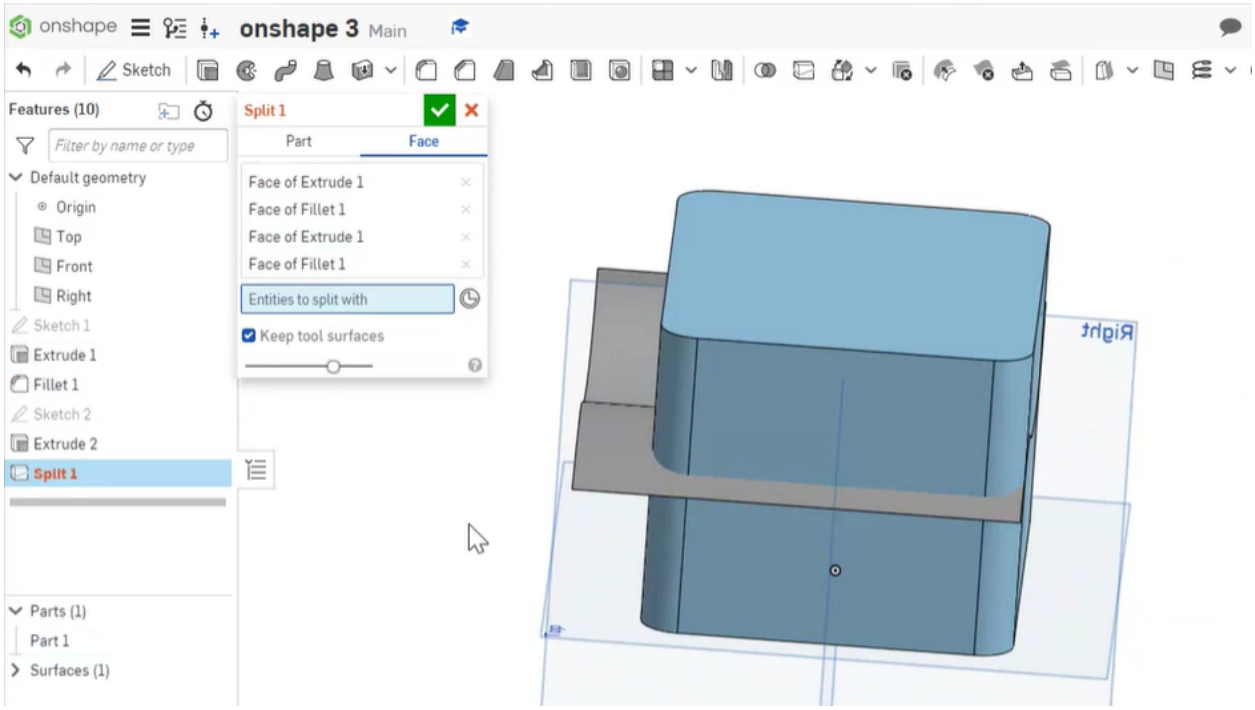


2. Fillet
   Round sharp interior and exterior edges and define as a standard constant radius, more stylized conic or variable.



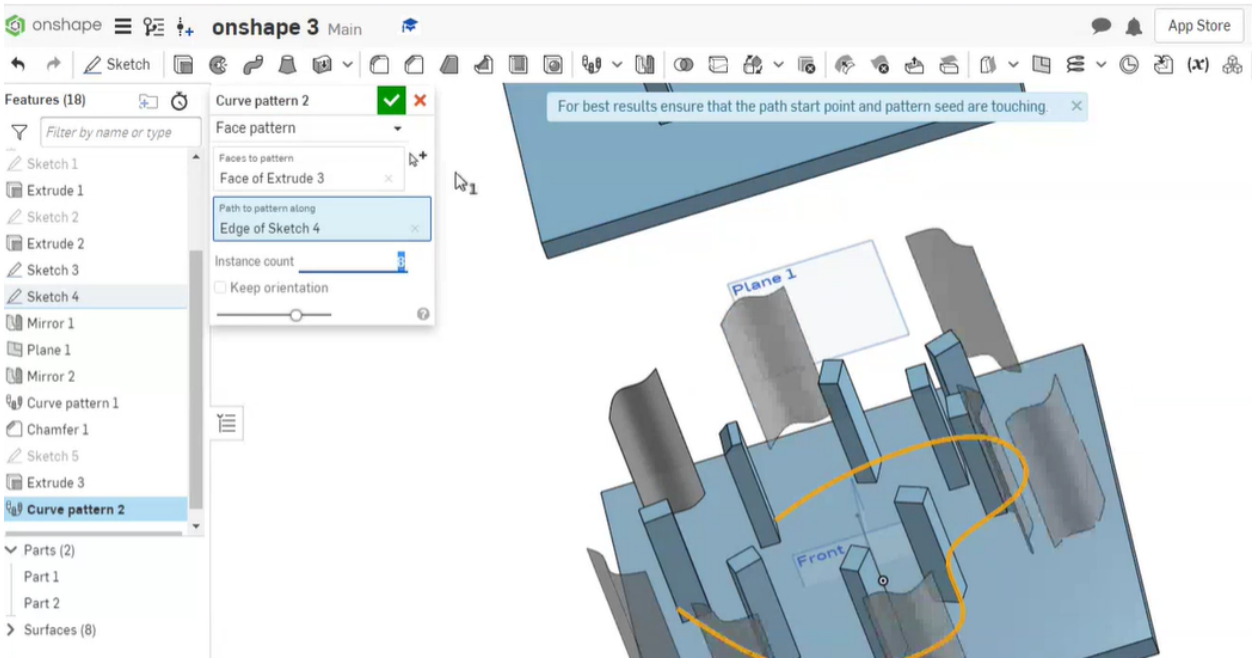
3. Split

Separate an existing part or face into multiple new parts or faces using a plane, mate connector, surface or face of a part.

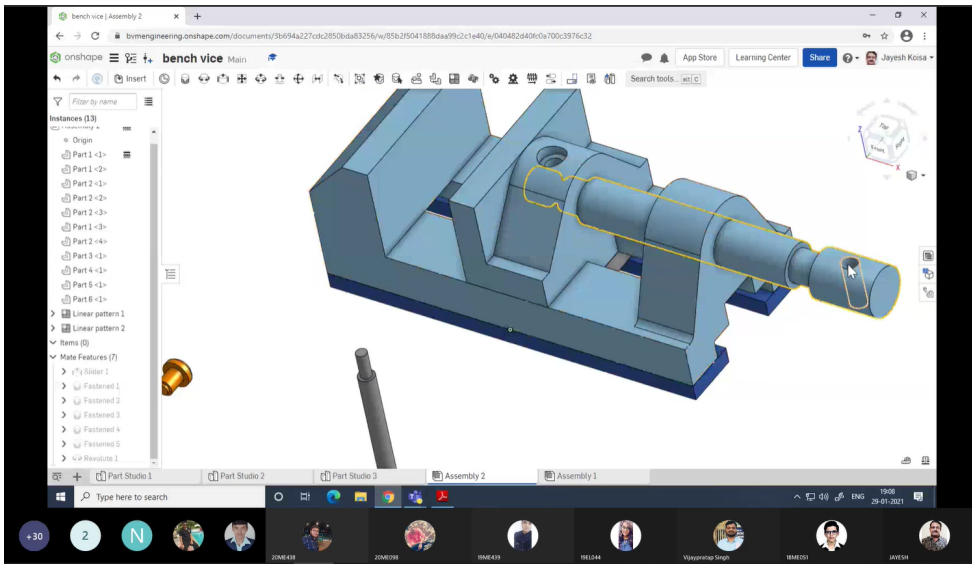


4. Linear Pattern
   Replicate selected parts, faces, or features and arrange them in a row or grid pattern. Create new parts or modify existing parts by adding or removing material, or intersecting parts in its path. Linear pattern may also be used during an active sheet metal operation.

5. Curve Pattern



6. Bench Vice - Part Assembly
   From the assignment sir provided the day before, we needed to assemble them and also the parts we made this day. All comprised to make up a mechanical instrument known as Bench Vice.



7. Onshape Materials' Library

8. Mass Properties

9. Animate

Day 4:
This day concluded lecture series with implementing different views on a paper. Sir also talked about kinematic pairs and their assembly which is slightly different from assembling regular objects.
Topics coverd in detail on this day:

1. Drawing
2. Projection View
3. Dimension
4. Section View
5. Broken-out Section
6. Break View
7. Geometric Tolerance
8. BOM Table
9. Mechanism - Link assembly
10. Revolute

In the end sir initiated a doubt session for all. Sir also shared numerous insights which can only be gained with experience, and students followed them with genuine interest.

Sir also talked about the importance of real-time collaboration amongst the team members in order to work efficiently in any organisation. In a world filled with challenges how teams can tackle their problems easily and efficiently using software which is available to them all the time and can access remotely.

One of the many advantages of Onshape is its flexible interface available not only for high-performance desktop setups but also on mobile platforms-Android Play Store & iOS App Store. He also demonstrated how Onshape can be installed and use basic features, on his android mobile device. Students' doubts were cleared during and after each session.

Students provided their valuable time and patience in learning new tech.

The lecture series was very well coordinated by Keivalya Pandya, Jay Goswami and Vaidehi Shah under the guidance of Prof V R Singh, Prof A M Thakkar and Prof A B Damor.