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Estd : 2008

INNOVATIVE TEACHING METHODOLOGY

3D INTERACTIVE PARTS, ASSEMBLIES & DRAWINGS IN ONSHAPE

Prepared by

Srikanth Rangdal, Assistant Professor, Dept of Mech. Engg., MCET

Courses benefitted

- ⊕ Machine Drawing
- ⊕ Machine Drawing & Modeling Lab
- ⊕ Computer-Aided Production Drawing & CAM Lab

These assemblies bring to life the machines from the book Machine Drawing by K. L. Narayana. These can be interactively watched by students anytime anywhere & help them visualise in 3D.

Book Referred

Drawings from the book "Machine Drawing" by "K L Narayana" were referred for modelling the assemblies. (Creative freedom used wherever the 2D diagrams are incompatible with available CAD features.)

Benefit to the institute

The cost invested in physical models will be saved while actually significantly improving the overall experience of students.

Features / Facilities

The students will be able to carry out below-mentioned activities on the 3D Assemblies.

1. Interactively view 3D geometry of each part separately.
2. Apply sections on each part to observe & learn from the sectional view & hatching.
3. Assembly enables constrained Motion of parts relative to a fixed frame which students can manually drag on their smartphone screens.
4. Animation for the relative motion between constrained parts using a Desktop or Laptop.
5. Detailed drawing of each part is also provided in the same file so they can practice modelling the same in the software of their choice.
6. Drawing/s of assembly with balloons is provided for reference along with complete Bill of Materials
7. Sectional views can be created if required to watch internal components of an assembly in action.
8. Special Half sectional views or broken views provided wherever necessary for extra clear visualisation.
9. The files can be accessed easily through the link given below on any of the devices mentioned below:

Devices Supported

1. Smartphones / Tabs running iOS (iPhone & iPad) or Android or Chrome OS
2. Desktops / Laptops running Macintosh, Windows, Chrome OS or any variety of Linux with Chrome or other such supported Browser.
3. Sharing the file to students on mobile devices through the link. (Requirements: Android or iOS smartphone or desktop/laptop with supported browser)

Cost of equipment & software that student needs to access it

The educational version of OnShape is FREE. Any student can easily create the free account & then upgrade it to an educational version by filling the details of college & purpose of use. Any smartphone can work as good hardware.

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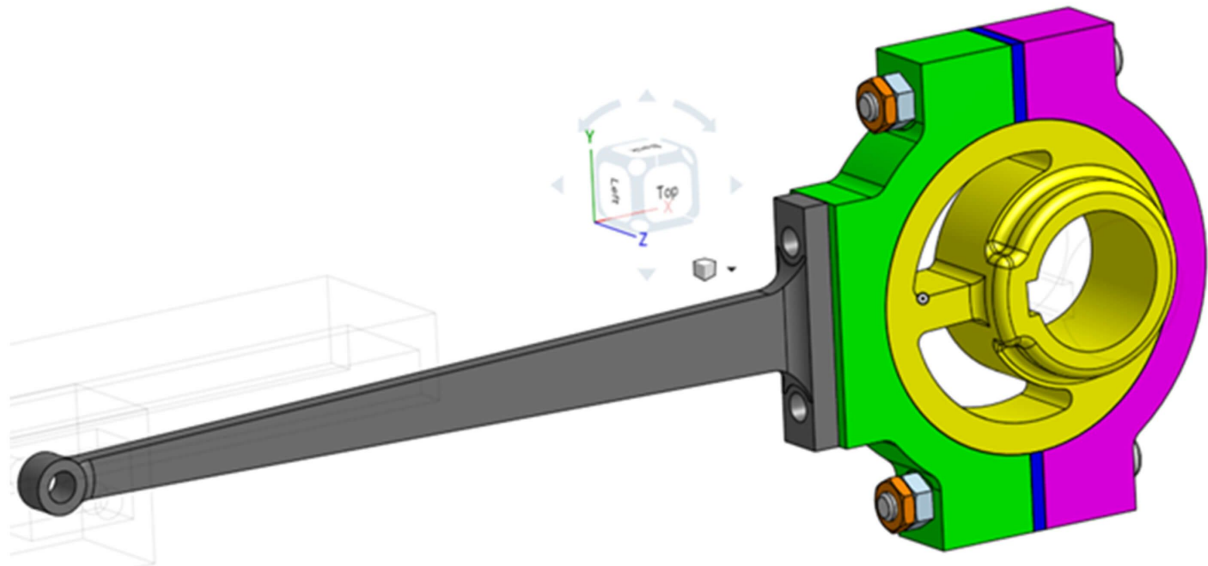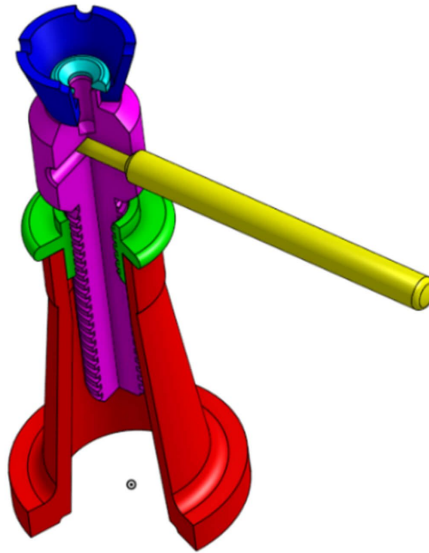## COLLEGE OF ENGINEERING & TECHNOLOGY
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INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL

ECCENTRIC ASSEMBLY IN ONSHAPE

Operation	Procedure
1. 3D interactive rotating visualisation.	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints.	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction.
4. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
5. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
6. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
7. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
8. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
9. Exploded View	⊕ Click on the exploded view option on the right in assembly to create

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INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL

SCREW JACK ASSEMBLY IN ONSHAPE

(PREPARED BY: SRIKANTH RANGDAL, MTECH IN AMS)

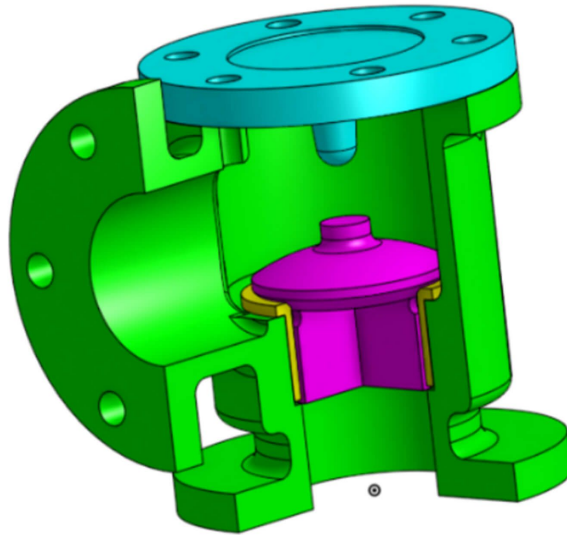| Operation	Procedure
1. 3D interactive rotating visualisation.	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Half Sectional View	⊕ Verification of the faces visible in half sectional view. ⊕ Edges to hide in the other half also can be verified.
4. Moving the Assembly within constraints	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction.
5. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
6. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats
7. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
8. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
9. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
10. Exploded View	⊕ Click on the exploded view option on the right in assembly to create.

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NON-RETURN VALVE ASSEMBLY IN ONSHAPE

(PREPARED BY: SRIKANTH RANGDAL, MTECH IN AMS)

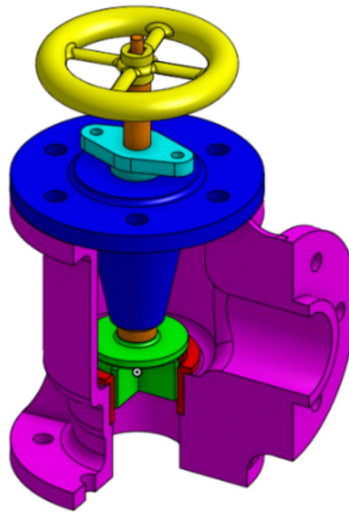| Operation	Procedure
1. 3D interactive rotating visualisation.	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction
4. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
5. Half Sectional View	⊕ Verification of the faces visible in half sectional view. ⊕ Edges to hide in the other half also can be verified.
6. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
7. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
8. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
9. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
10. Exploded View	⊕ Click on the exploded view option on the right in assembly to create.

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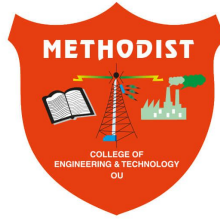Accredited by NAAC with A+ Grade

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FEED CHECK VALVE ASSEMBLY IN ONSHAPE

(PREPARED BY: SRIKANTH RANGDAL, MTECH IN AMS)

Operation	Procedure
1. 3D interactive rotating visualisation.	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction
4. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".
5. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.
6. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
9. Half Sectional View	⊕ Verification of the faces visible in half sectional view. ⊕ Edges to hide in the other half also can be verified.
10. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
11. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
12. Exploded View	⊕ Click on the exploded view option on the right in assembly to create.

INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL

FEED CHECK VALVE ASSEMBLY IN ONSHAPE

Flawed design as given in the book
(Doesn't transmit motion)
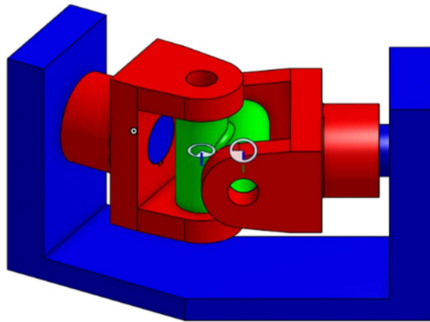
Corrected design
(Motion transmitted properly)

(PREPARED BY: SRIKANTH RANGDAL, MTECH IN AMS)

Operation	Procedure
1. 3D interactive rotating visualisation.	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction
4. Identification of the design flaw	⊕ The design given in the book cannot transmit motion across inclined shafts. The same can be verified.
5. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
6. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
7. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
8. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
9. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
10. Exploded View	⊕ Click on the exploded view option on the right in assembly to create.

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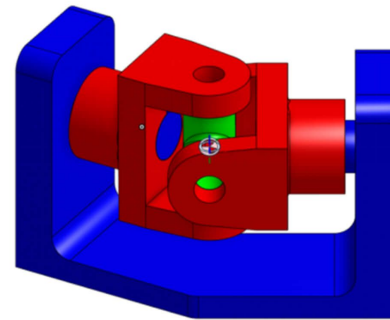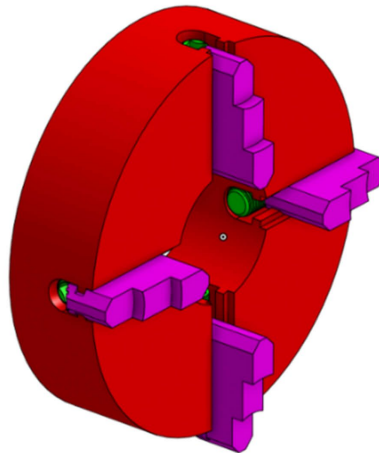Approved by AICTE, New Delhi & Affiliated to Osmania University

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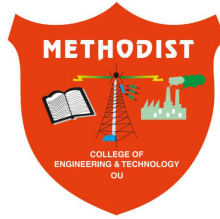**INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL**

4 JAW INDEPENDENT CHUCK ASSEMBLY IN ONSHAPE

(PREPARED BY: SRIKANTH RANGDAL, MTECH IN AMS)

Operation	Procedure
1. 3D interactive rotating visualisation	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction
4. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".
5. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.
6. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
9. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
10. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
11. Exploded View	⊕ Click on the exploded view option on the right in assembly to create

INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL

PLUMMER BLOCK ASSEMBLY IN ONSHAPE

(PREPARED BY: SRIKANTH RANGDAL, MTECH IN AMS)

Operation	Procedure
1. 3D interactive rotating visualisation	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction
4. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".
5. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.
6. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
9. Half Sectional View	⊕ Verification of the faces visible in half sectional view. ⊕ Edges to hide in the other half also can be verified.
10. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
11. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
12. Exploded View	⊕ Click on the exploded view option on the right in assembly to create

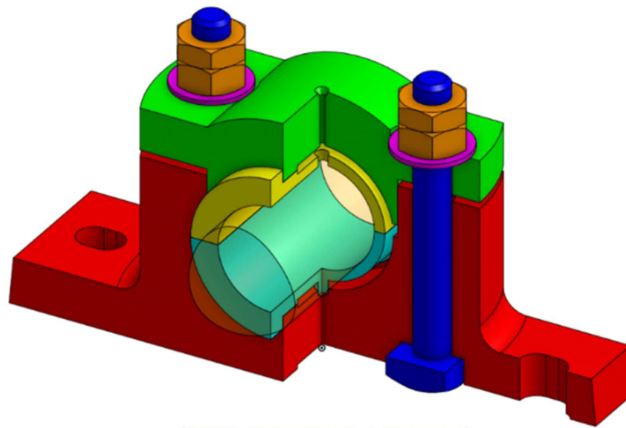## METHODIST
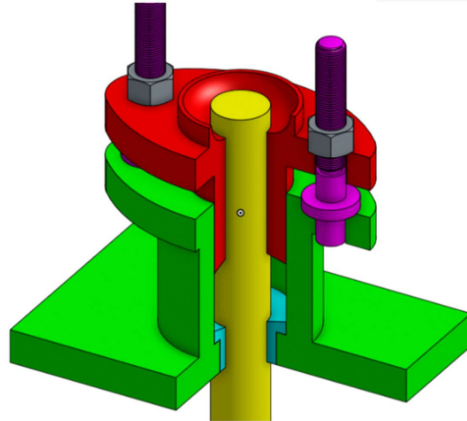### COLLEGE OF ENGINEERING & TECHNOLOGY
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STUFFING BOX ASSEMBLY IN ONSHAPE

(PREPARED BY: SRIKANTH RANGDAL, MTECH IN AMS)

Operation	Procedure
1. 3D interactive rotating visualisation	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction
4. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".
5. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.
6. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
9. Half Sectional View	⊕ Verification of the faces visible in half sectional view. ⊕ Edges to hide in the other half also can be verified.
10. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
11. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
12. Exploded View	⊕ Click on the exploded view option on the right in assembly to create.

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MACHINE VICE ASSEMBLY IN ONSHAPE

(PREPARED BY: SRIKANTH RANGDAL, MTECH IN AMS)

Operation	Procedure
1. 3D interactive rotating visualisation	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction
4. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".
5. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.
6. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
9. Half Sectional View	⊕ Verification of the faces visible in half sectional view. ⊕ Edges to hide in the other half also can be verified.
10. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
11. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
12. Exploded View	⊕ Click on the exploded view option on the right in assembly to create.

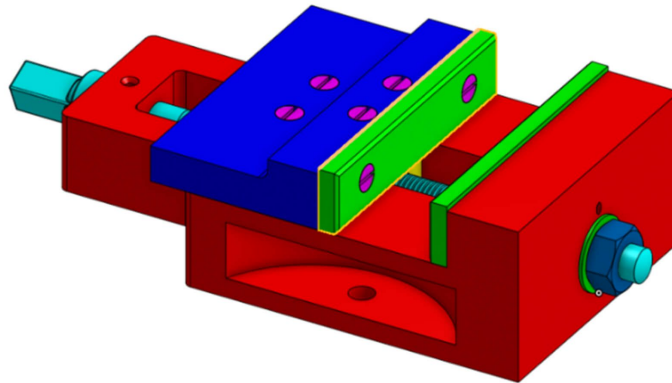# METHODIST
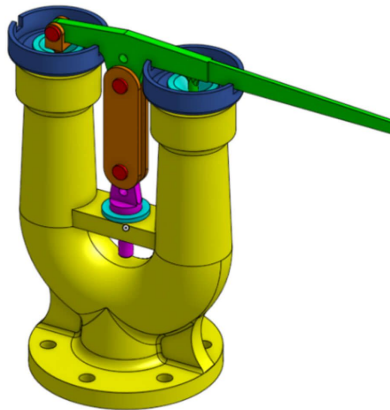## COLLEGE OF ENGINEERING & TECHNOLOGY
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RAMSBOTTOM SAFETY VALVE ASSEMBLY IN ONSHAPE

(PREPARED BY: SRIKANTH RANGDAL, MTECH IN AMS)

Operation	Procedure
1. 3D interactive rotating visualisation	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction
4. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".
5. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.
6. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
9. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
10. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
11. Exploded View	⊕ Click on the exploded view option on the right in assembly to create.

INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL

TAILSTOCK ASSEMBLY IN ONSHAPE

(PREPARED BY: SRIKANTH RANGDAL, MTECH IN AMS)

Operation	Procedure
1. 3D interactive rotating visualisation	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction
4. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".
5. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.
6. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
9. Half Sectional View	⊕ Verification of the faces visible in half sectional view. ⊕ Edges to hide in the other half also can be verified.
10. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
11. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
12. Exploded View	⊕ Click on the exploded view option on the right in assembly to create.

INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL

AIR COCK ASSEMBLY IN ONSHAPE

(PREPARED BY: SRIKANTH RANGDAL, MTECH IN AMS)

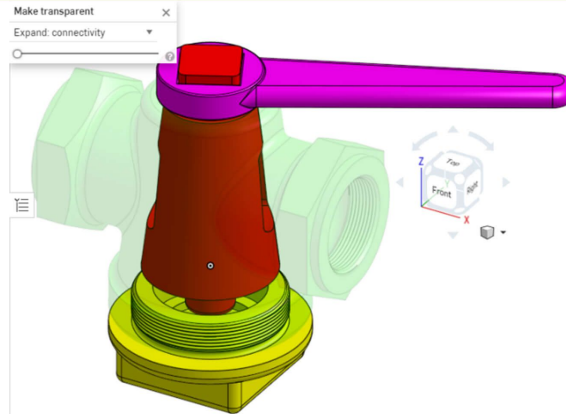| Operation	Procedure
1. 3D interactive rotating visualisation	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction
4. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".
5. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.
6. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
9. Half Sectional View	⊕ Verification of the faces visible in half sectional view. ⊕ Edges to hide in the other half also can be verified.
10. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
11. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
12. Exploded View	⊕ Click on the exploded view option on the right in assembly to create.

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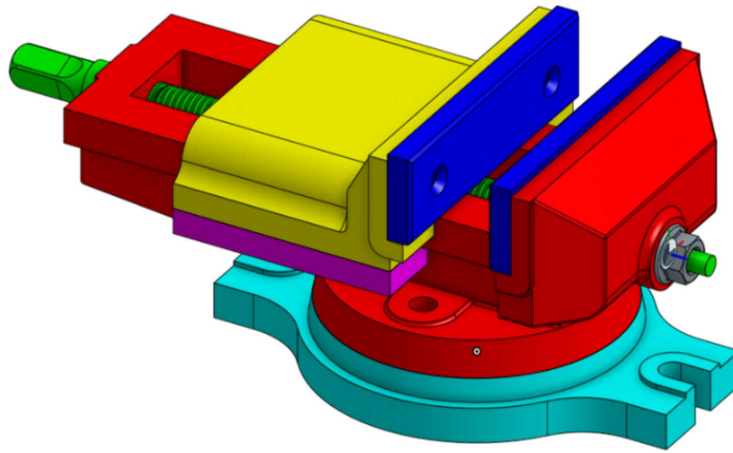## COLLEGE OF ENGINEERING & TECHNOLOGY
Approved by AICTE, New Delhi & Affiliated to Osmania University
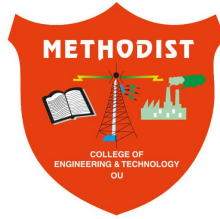**Accredited by NAAC with A+ Grade**

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INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL

SWIVEL VICE ASSEMBLY IN ONSHAPE

(PREPARED BY: SRIKANTH RANGDAL, MTECH IN AMS)

Operation	Procedure
1. 3D interactive rotating visualisation	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction
4. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".
5. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.
6. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
9. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
10. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
11. Exploded View	⊕ Click on the exploded view option on the right in assembly to create.

INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL

DOUBLE COTTERED SLEEVE JOINT ASSEMBLY IN ONSHAPE

(Prepared by: Srikanth Rangdal, MTech in AMS)

Operation	Procedure
1. 3D interactive rotating visualisation.	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints.	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction.
4. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".
5. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.
6. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
9. Half Sectional View	⊕ Verification of the faces visible in half sectional view. ⊕ Edges to hide in the other half also can be verified.
10. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
11. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
12. Exploded View	⊕ Click on the exploded view option on the right in assembly to create

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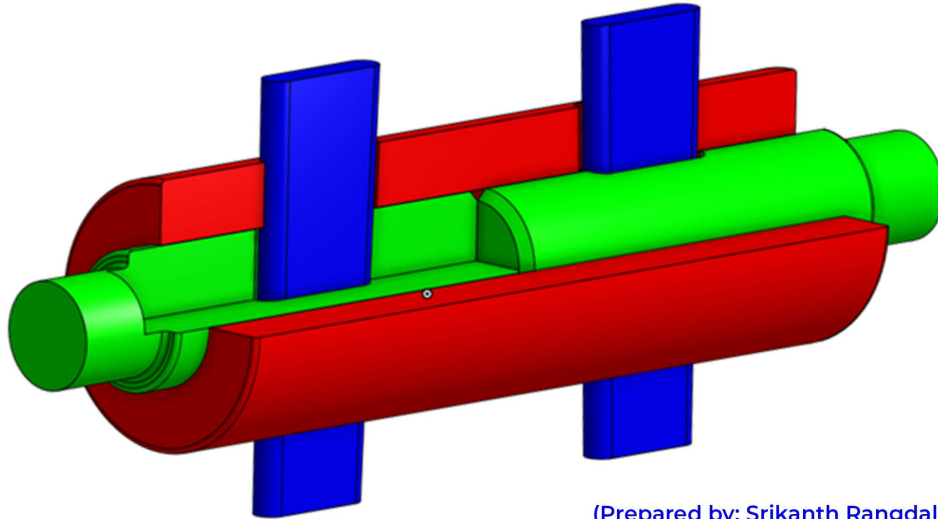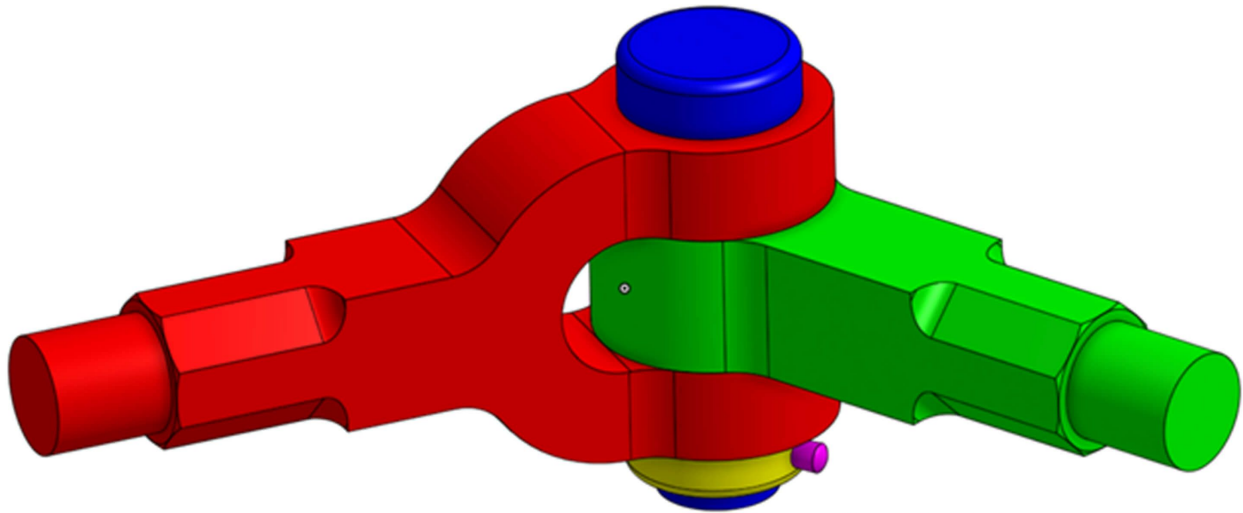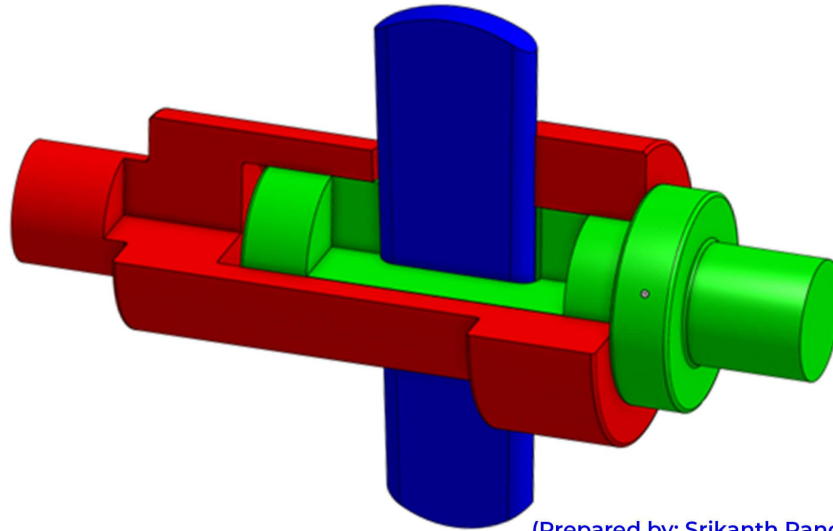**COLLEGE OF ENGINEERING & TECHNOLOGY**
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INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL

KNUCKLE JOINT ASSEMBLY IN ONSHAPE

(Prepared by: Srikanth Rangdal, MTech in AMS)

Operation	Procedure
1. 3D interactive rotating visualisation.	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints.	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction.
4. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".
5. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.
6. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
9. Half Sectional View	⊕ Verification of the faces visible in half sectional view. ⊕ Edges to hide in the other half also can be verified.
10. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
11. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
12. Exploded View	⊕ Click on the exploded view option on the right in assembly to create

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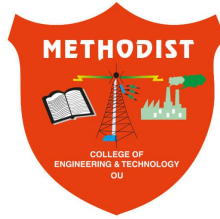
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INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL

SOCKET SPIGOT JOINT / COTTERED JOINT IN ONSHAPE

(Prepared by: Srikanth Rangdal, MTech in AMS)

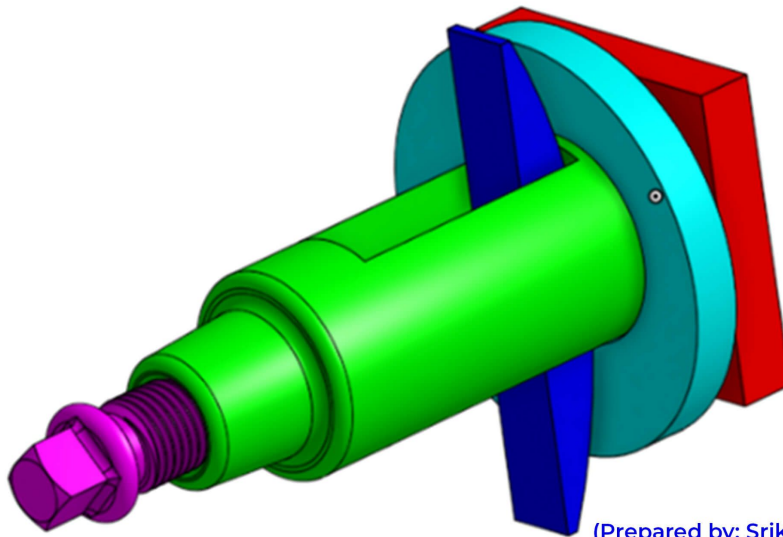| Operation	Procedure
1. 3D interactive rotating visualisation.	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints.	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction.
4. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".
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6. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
9. Half Sectional View	⊕ Verification of the faces visible in half sectional view. ⊕ Edges to hide in the other half also can be verified.
10. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
11. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
12. Exploded View	⊕ Click on the exploded view option on the right in assembly to create

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INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL

SOCKET SPIGOT JOINT / COTTERED JOINT IN ONSHAPE

(Prepared by: Srikanth Rangdal, MTech in AMS)

Operation	Procedure
1. 3D interactive rotating visualisation.	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).
3. Moving the Assembly within constraints.	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction.
4. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".
5. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.
6. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.
9. Half Sectional View	⊕ Verification of the faces visible in half sectional view. ⊕ Edges to hide in the other half also can be verified.
10. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.
11. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.
12. Exploded View	⊕ Click on the exploded view option on the right in assembly to create

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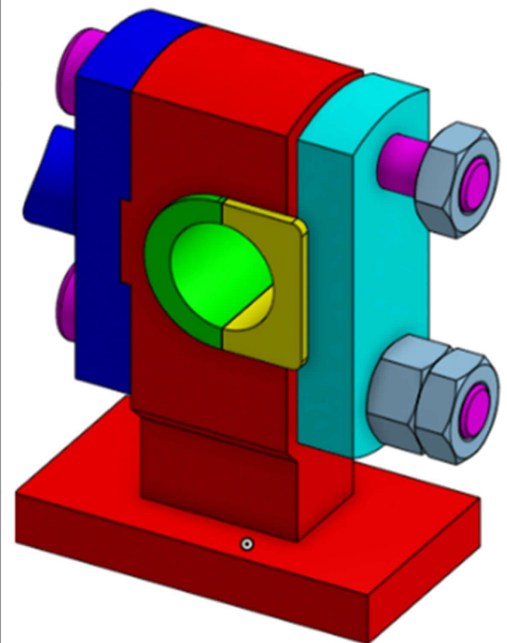
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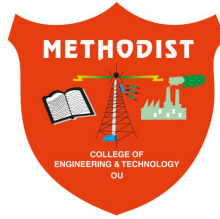
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INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL

SOCKET SPIGOT JOINT / COTTERED JOINT IN ONSHAPE

(Prepared by: Srikanth Rangdal, MTech in AMS)

Operation	Procedure	
1. 3D interactive rotating visualisation.	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.	
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).	
3. Moving the Assembly within constraints.	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction.	
4. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.	
5. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".	
6. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.	
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.	
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.	
9. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.	
10. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.	
11. Exploded View	⊕ Click on the exploded view option on the right in assembly to create	

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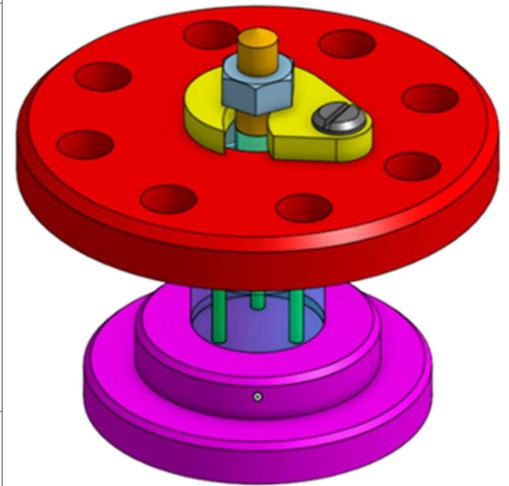**Accredited by NAAC with A+ Grade**
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INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL

JIG PLATE ASSEMBLY IN ONSHAPE

(Prepared by: Srikanth Rangdal, MTech in AMS)

Operation	Procedure	
1. 3D interactive rotating visualisation.	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.	
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).	
3. Moving the Assembly within constraints.	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction.	
4. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.	
5. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".	
6. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.	
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.	
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.	
9. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.	
10. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.	
11. Exploded View	⊕ Click on the exploded view option on the right in assembly to create	

INNOVATIVE TEACHING METHODOLOGY - MR. SRIKANTH RANGDAL

CRANE HOOK ASSEMBLY IN ONSHAPE

(Prepared by: Srikanth Rangdal, MTech in AMS)

Operation	Procedure	
1. 3D interactive rotating visualisation.	⊕ Right Click & Drag to rotate objects. The objects rotate about the point at which right click is done.	
2. Changing Dimensions	⊕ Select part studio from bottom or right click on the part in assembly & select "Switch to_____" option. ⊕ Edit the Sketch or Feature & Change dimensions suitably. ⊕ The changes will reflect in the assembly & drawing (upon refresh).	
3. Moving the Assembly within constraints.	⊕ Left Click on a link in 'assembly' & drag. ⊕ Left Click on a link in 'assembly' & then use the gizmo to move in specific direction.	
4. Animate	⊕ Right Click on the Mate Features & Select Animate. ⊕ Change the limits of angles suitably & Click on Play.	
5. Section or Transparency	⊕ Click on the options below cube & select "Sectional View" & click on the part to create the sectional view. ⊕ Right click on any part & select "Make Transparent".	
6. Isolate Parts	⊕ Right click on a part & select "Hide other instances" or hide parts one by one from the navigation.	
7. 3D Print	⊕ Export the parts by right clicking the part studio & select suitable formats.	
8. Learn to Model	⊕ Right click on any feature in the parts studio & select roll to here. ⊕ Then move it down step by step to see how the part was modelled.	
9. Learn to Assemble	⊕ Create a fresh Assembly, insert parts & apply constraints one by one.	
10. Check out the part drawings	⊕ Click on the drawing studio & check the orthographic views of parts with dimensioning & production details wherever available.	
11. Exploded View	⊕ Click on the exploded view option on the right in assembly to create	