



Yavatmal, Maharashtra, India
C47p+44x, Pimpalgaon, Yavatmal, Maharashtra
445001, India
Lat 20.412596° Long 78.13533°
Monday, 13/04/2026 11:51 AM GMT +05:30



Yavatmal, Maharashtra, India
C47p+44x, Pimpalgaon, Yavatmal, Maharashtra
445001, India
Lat 20.412596° Long 78.13533°
Monday, 13/04/2026 11:51 AM GMT +05:30



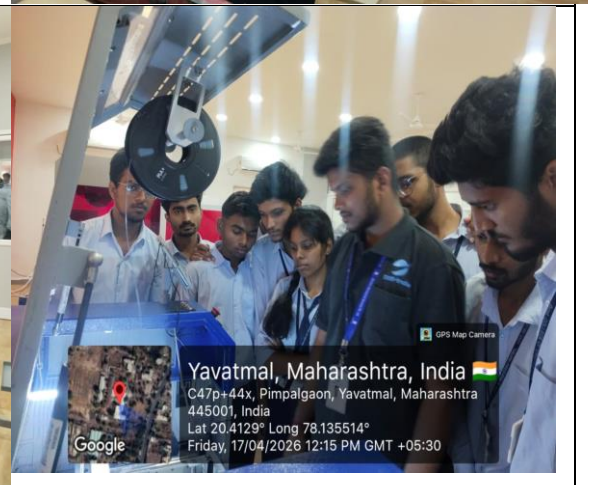
Yavatmal, Maharashtra, India
C47p+44x, Pimpalgaon, Yavatmal, Maharashtra
445001, India
Lat 20.412595° Long 78.135319°
Thursday, 23/04/2026 05:07 PM GMT +05:30



Yavatmal, Maharashtra, India
C47p+44x, Pimpalgaon, Yavatmal, Maharashtra
445001, India
Lat 20.41262° Long 78.13533°
Wednesday, 15/04/2026 12:40 PM GMT +05:30

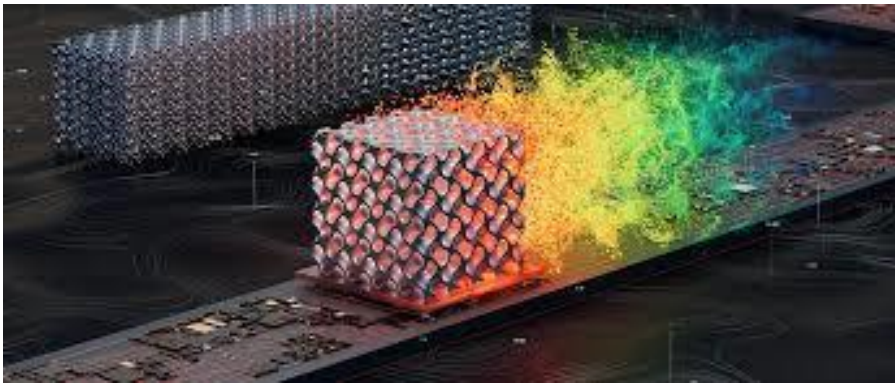


Yavatmal, Maharashtra, India
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445001, India
Lat 20.412618° Long 78.135383°
Friday, 17/04/2026 01:07 PM GMT +05:30



Yavatmal, Maharashtra, India
C47p+44x, Pimpalgaon, Yavatmal, Maharashtra
445001, India
Lat 20.4129° Long 78.135514°
Friday, 17/04/2026 12:15 PM GMT +05:30

CENTER OF EXCELLENCE



Design and Simulation Lab



Advanced Manufacturing Lab



Principal Investigator: Dr. S. R. Kewate

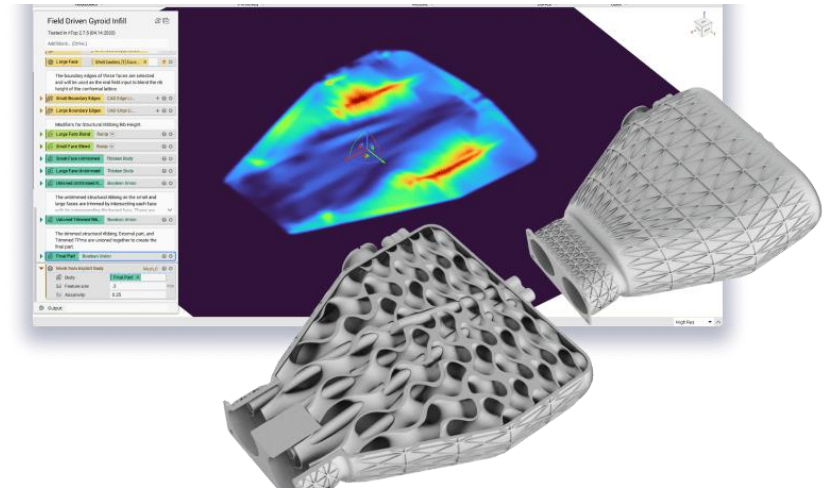


Co- Principal Investigator: Dr. S. R. Shiledar

Design and Simulation Lab

Solutions Available:-

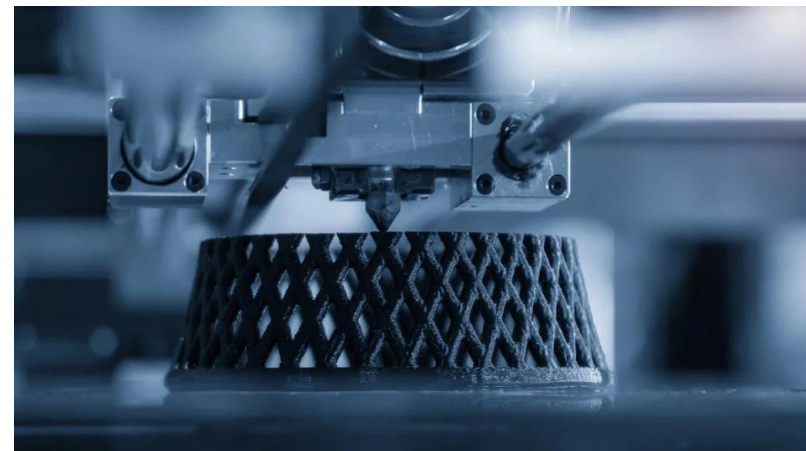
- PTC Creo Parametric
- Autodesk Fusion 360
- Autodesk Netfabb
- Altair Hyperworks



Advanced Manufacturing Lab

Technology / Equipment Available:-

- FFF 3D Printer - Hydra 16 AS
- FDM 3D Printer - Hydra 21
- SLA 3D Printer - Phrozen Sonic Mega 8K V2
- DLP 3D Printer - Phrozen Sonic XL 4K





Government College of Engineering **Honeywell** Yavatmal

Design and Simulation Lab

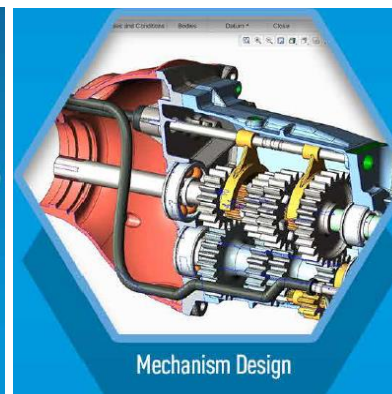
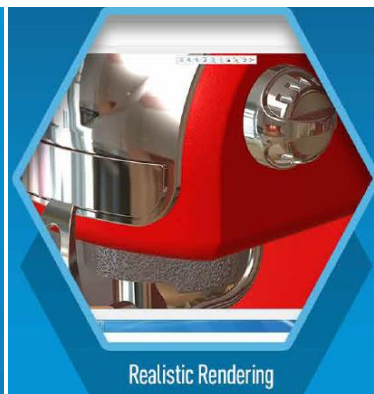
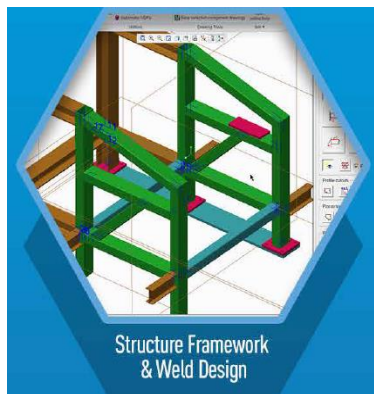
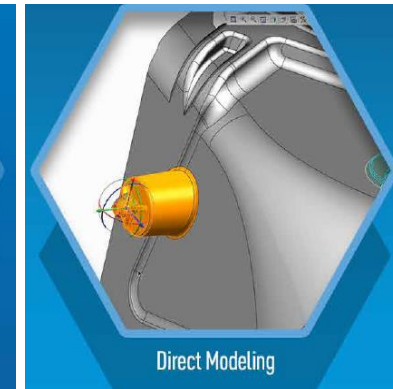
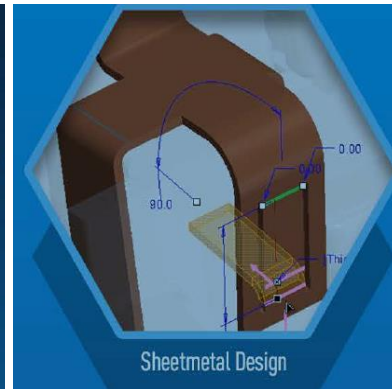
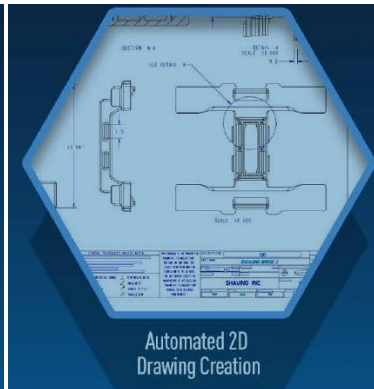
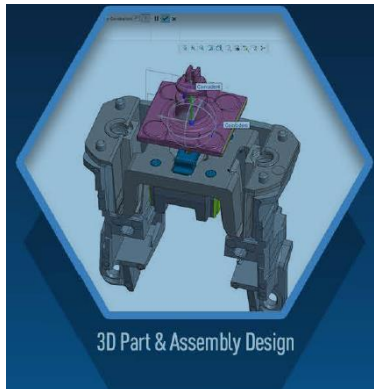
PTC Creo Parametric



Design and Simulation Lab

PTC Creo Parametric

Capabilities:-



Design and Simulation Lab

PTC Creo Parametric

Capabilities:-

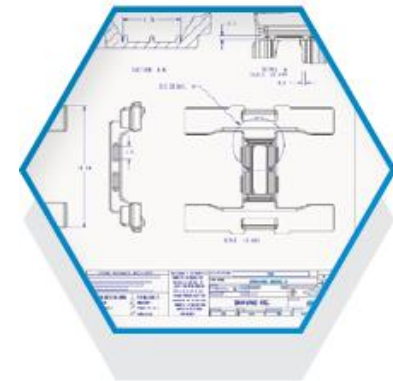
3D Part & Assembly Design

- Create precise geometry, regardless of model complexity
- Quickly build robust engineering features such as rounds, chamfers, holes, and more
- Create design variants using family tables
- Smarter, faster assembly modeling performance
- Static and dynamic interference detection



Automated 2D Drawing Creation & Update

- Create 2D and 3D drawings according to international standards, including ASME, ISO and JIS
- Automate the creation of drawings with templates
- Automatically create associative bill of materials associative bill of materials (BOM) with balloon notes



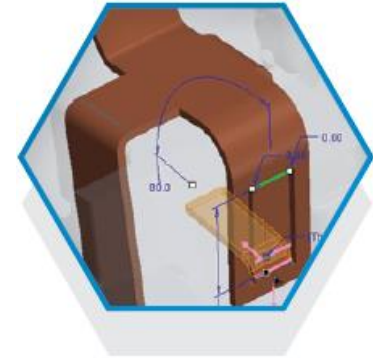
Design and Simulation Lab

PTC Creo Parametric

Capabilities:-

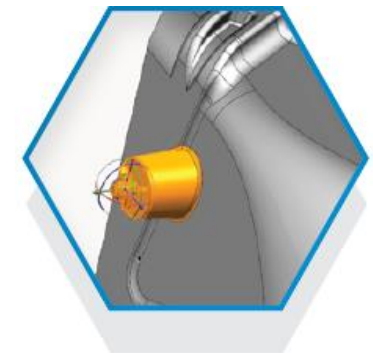
Sheet Metal Design

- Easily create walls, bends, punches walls, bends, punches, flanges, forms, and reliefs using the streamlined user interface
- Automatically generate flat patterns from 3D geometry
- Dynamically preview formed and flattened sheetmetal designs simultaneously
- Easily convert solid parts to sheetmetal
- Simply define sheetmetal design parameters, e.g. bend allowances



Direct Modeling (Flexible Modeling)

- Make changes to PTC Creo data regardless of design intent
- Modify non-PTC Creo data regardless of origin (Solidworks, STEP, etc...)
- Recognize rounds, chamfers, patterns and symmetry on imported geometry
- Create or recreate design intent and record edits as features



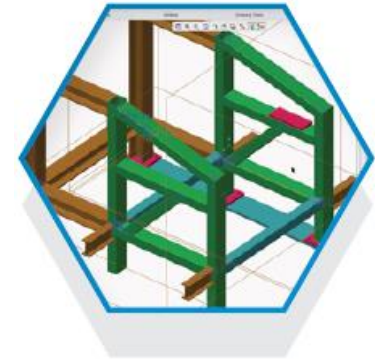
Design and Simulation Lab

PTC Creo Parametric

Capabilities:-

Structural Framework & Weld Design

- Optimized user interface for the structural framework design process
- Extract valuable information from the model, such as mass properties, clearances, interferences, and cost data
- Easily produce complete 2D weld documentation



Realistic Rendering and 3D Animation

- Create accurate, photorealistic images of products quickly, while rendering even the largest assemblies
- Shade with reflections for displaying different material classes such as metal, glass, paint, and plastic
- Create assembly/disassembly animations directly from the modeling environment



Design and Simulation Lab

PTC Creo Parametric

Capabilities:-

Mechanism Design

- Create mechanical connections
- Validate the kinematic motion of your design
- Establish motion envelopes to detect and avoid interferences



Product Data Management (PDM)

- Secures CAD models, their structures and relationships (PTC Creo, AutoCAD, SolidWorks, Inventor, Pro/ENGINEER, PTC Creo Elements/Direct, and PTC Mathcad) improving control and collaboration.
- Powerful searching tools – Quickly and easily search, copy or rename designs improving product information discovery and design reuse





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Design and Simulation Lab

Autodesk Fusion 360



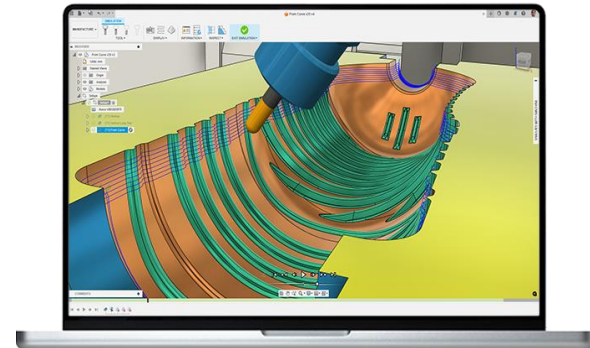
Design and Simulation Lab

Autodesk Fusion 360

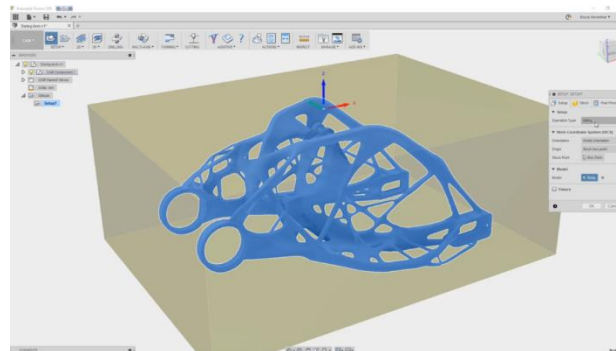
Capabilities:-



Computer Aided Design



Computer Aided Manufacturing



Computer Aided Engineering

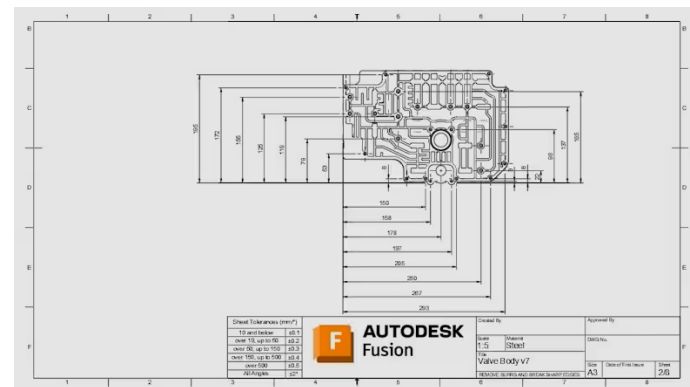
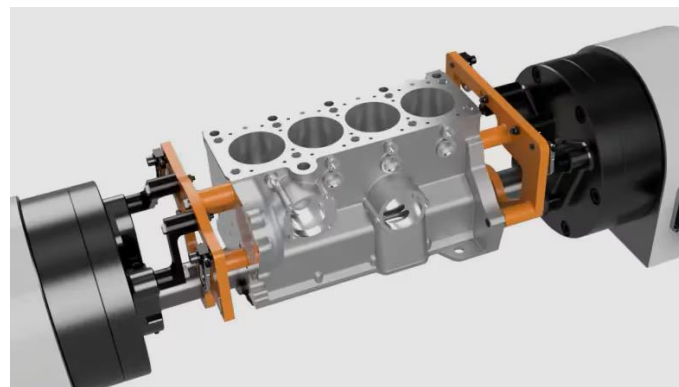
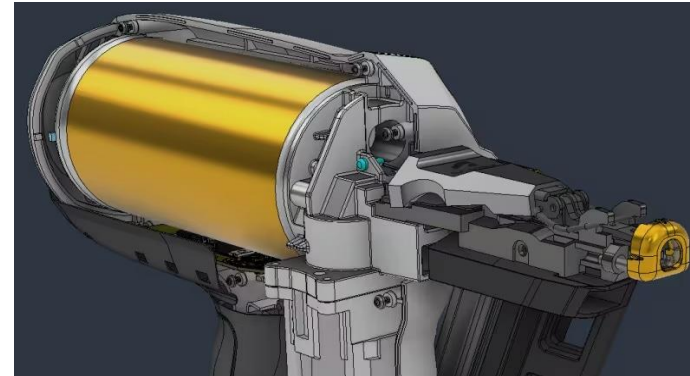
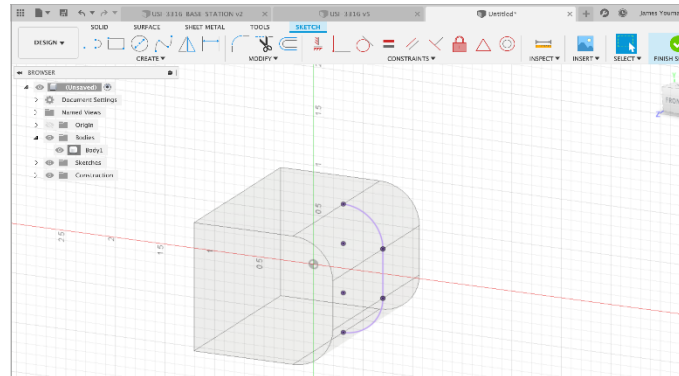
Design and Simulation Lab

Autodesk Fusion 360

Capabilities:-

Computer Aided Design

- Sketching
- Extrusion
- Modification
- Assemblies
- Drawings



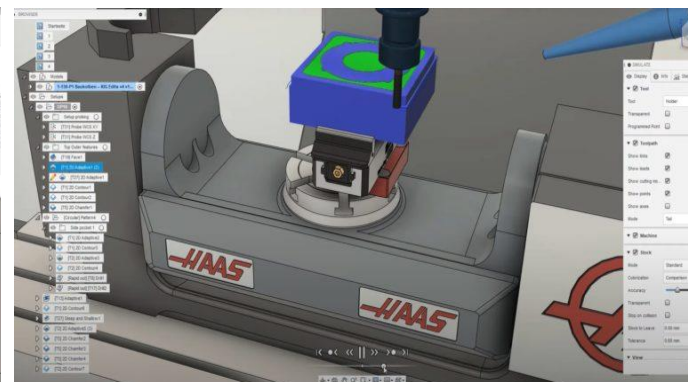
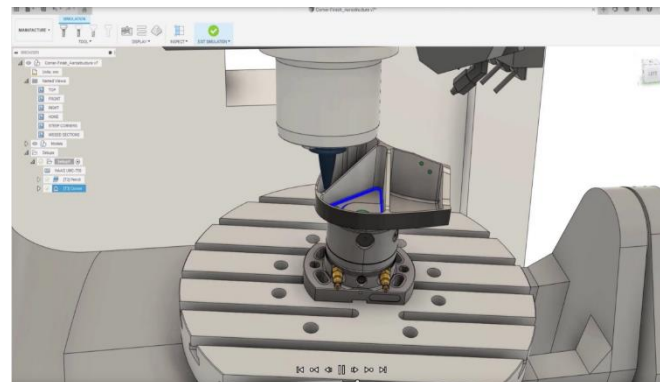
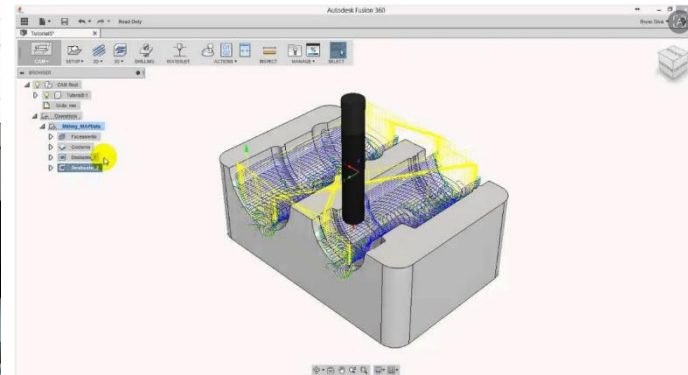
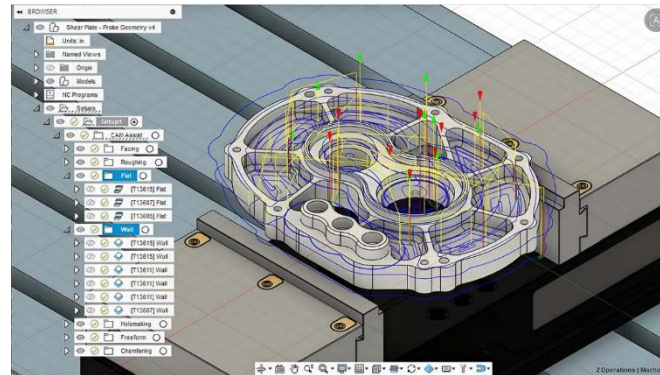
Design and Simulation Lab

Autodesk Fusion 360

Capabilities:-

Computer Aided Manufacturing

- CAM Setup
- 2.5 Axis Toolpathing
- 3 Axis Toolpathing
- Machine Simulation
- Post processing



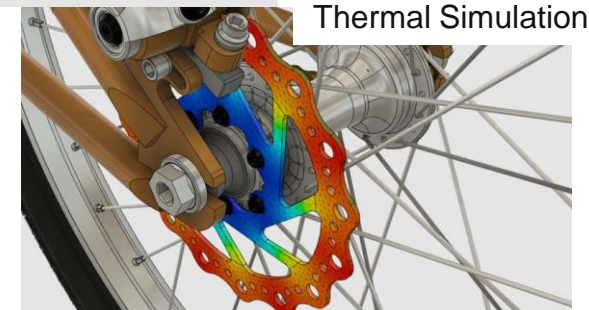
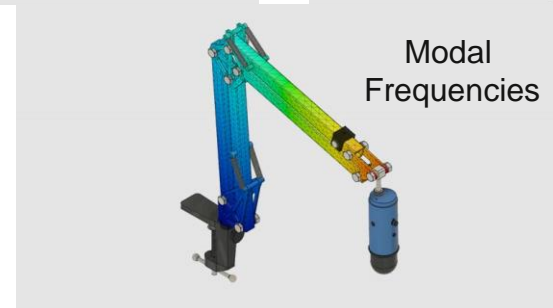
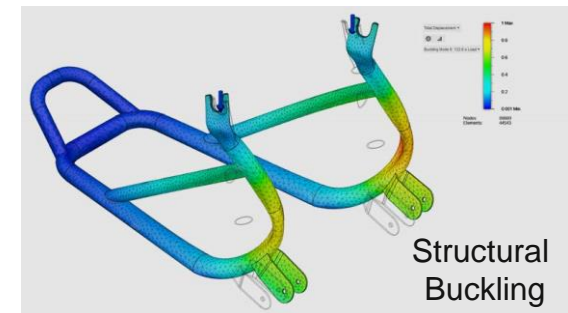
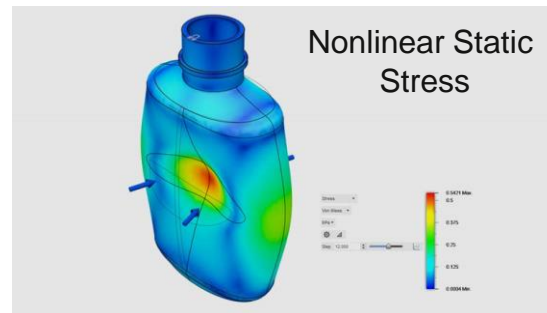
Design and Simulation Lab

Autodesk Fusion 360

Capabilities:-

Computer Aided Engineering

- Digital Simulation
- Static Stress
- Modal frequency
- Thermal and Thermal Stress
- Structural Analysis
- Generative Design
- Buckling
- Non-Linear Stress
- Shape Optimization
- Validation & Documentation

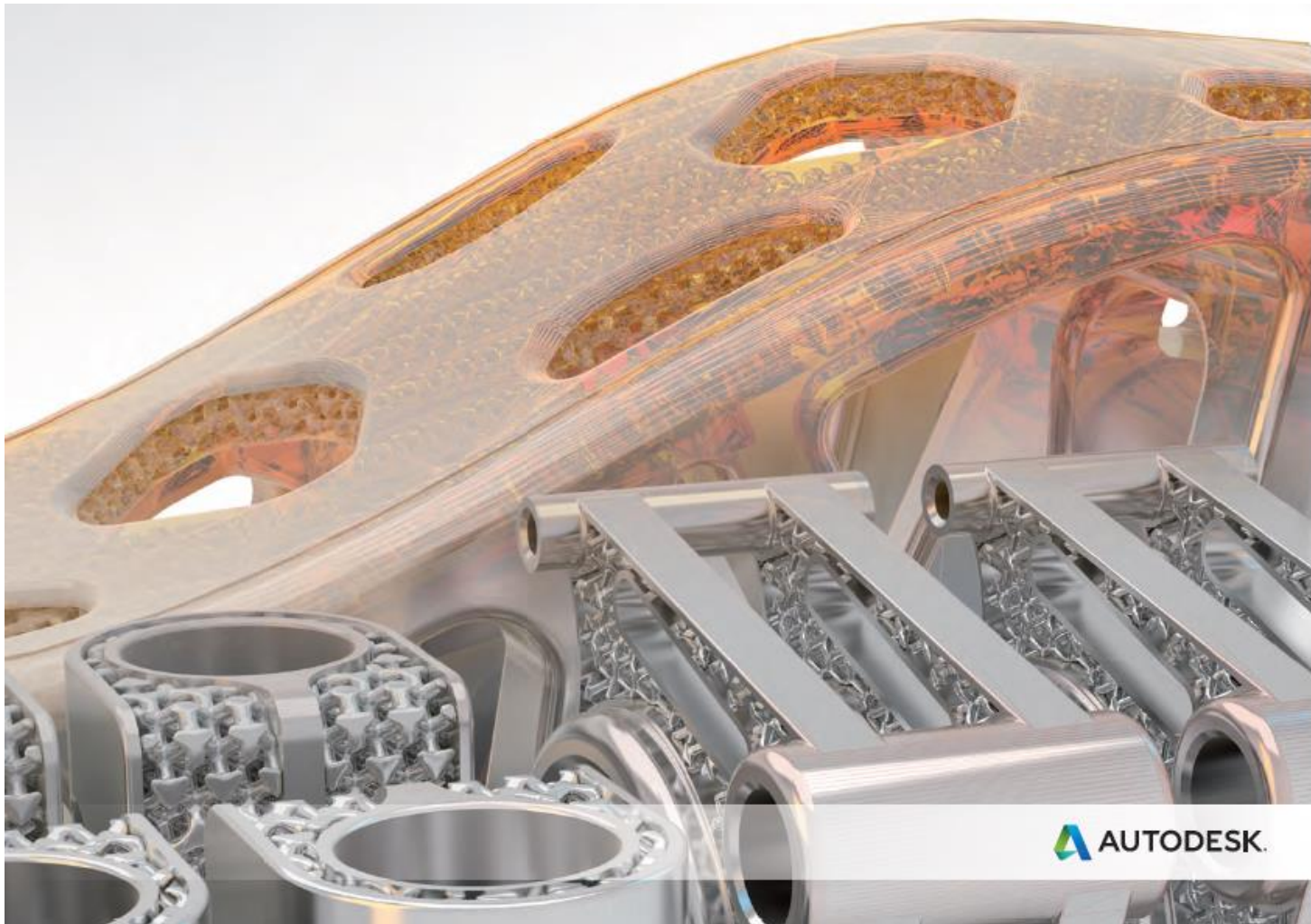




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Design and Simulation Lab

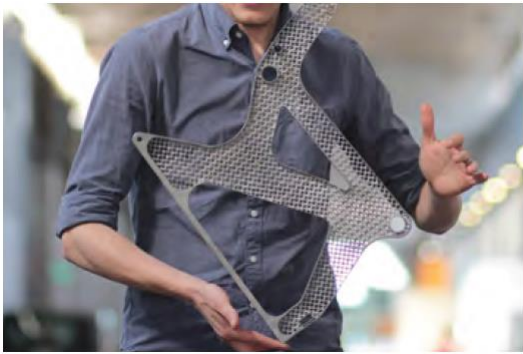
Autodesk Netfabb



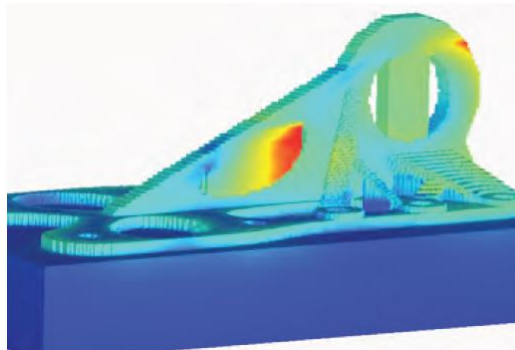
Design and Simulation Lab

Autodesk Netfabb

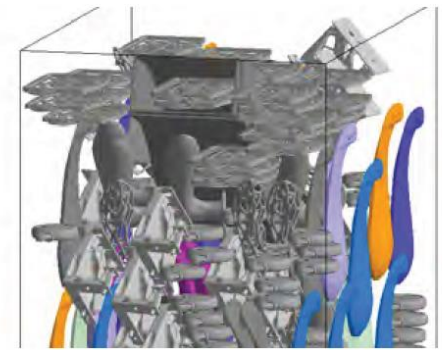
Capabilities:-



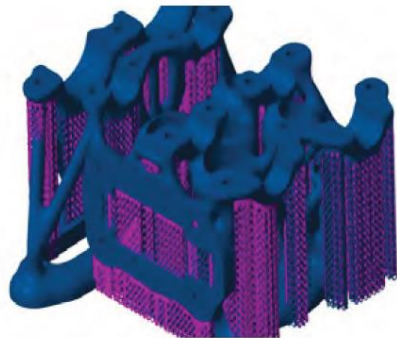
Design for Additive



Process Simulation



Platform Packing



Configurable Build Supports



Dedicated Machine Workspaces

Build Statistics	Support
Volume: 415.42 cm ³	0.00 mm ³
Build height: 115.35 mm	Build time: 129h 29m 41s
Machine Configuration	
Configuration: EOS Aluminium AlSi10Mg (p) Chamy	
Distance between Part and Platform: 3.00 mm	
Buildplate thickness: 25.00 mm	
Current part	
Part name: BMX Handle Support v24_r25_v45	
Build strategy: Solid part	
Laser index:	
<input type="checkbox"/> Orient Part	<input type="checkbox"/> Import Supports
<input type="checkbox"/> Create Supports	<input type="checkbox"/> Remove Supports
Current Build	
<input type="button" value="Start build simulation"/>	<input type="button" value="Load Simulation Result"/>
<input type="button" value="Toolpath Visualization"/>	<input type="button" value="Export build data"/>

Design and Simulation Lab

Autodesk Netfabb

Capabilities:-

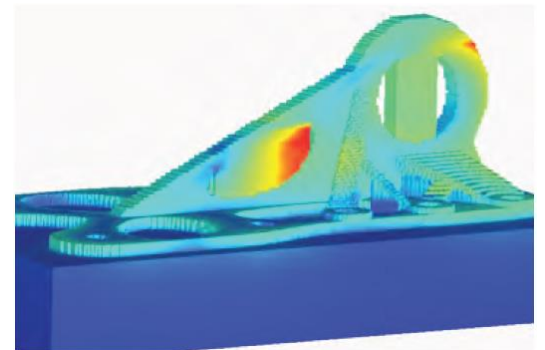
Design for Additive

- Netfabb includes design optimization tools that help you achieve results that are lighter in weight, as stiff or as flexible as needed, with your chosen aesthetics and unique material properties.
- Generate forms optimized for stiffness and weight, based on the loads and constraints of the part.
- Quickly apply complex internal lattice structures and surface skins.
- Use the optimization engine to refine parts automatically and develop libraries of unique structures by combining your unique unit cells.



Process Simulation

- Predict and mitigate various metal laser powder bed fusion build failures before manufacturing in significantly less time than is required to build the part.
- Compensate your models based on simulation results to create a modified pre-form, designed to warp into the desired shape when manufactured, resulting in nearly no net distortion.
- Reduce the need for trial and error, saving time and money.



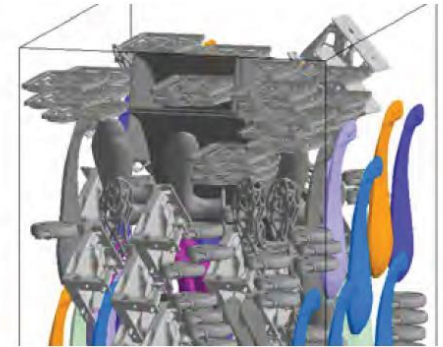
Design and Simulation Lab

Autodesk Netfabb

Capabilities:-

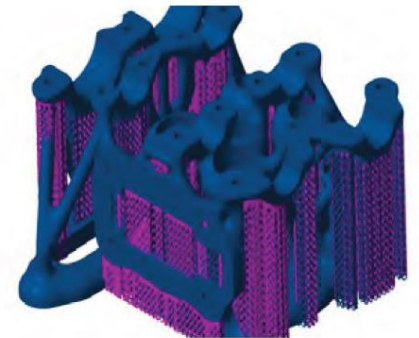
Platform Packing

- Automatic packing is a fast and convenient way to find the most efficient way to pack parts on the build platform.
- Convert your 3D models into layers and all relevant 3D file types before exporting slice files directly to your machines.



Configurable Build Supports

- Identify areas that require support and use manual or fully automatic supports tools to generate support structures.



Design and Simulation Lab

Autodesk Netfabb

Capabilities:-

Dedicated Machine Workspaces

- Streamline your build preparation process with integrated workspaces for every AM process for over 100 machines including EOS, SLM, HP, Farsoon, Formlabs and more.





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Design and Simulation Lab

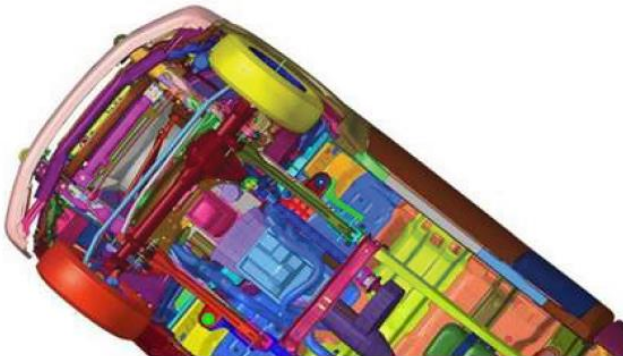
Altair Hyperworks



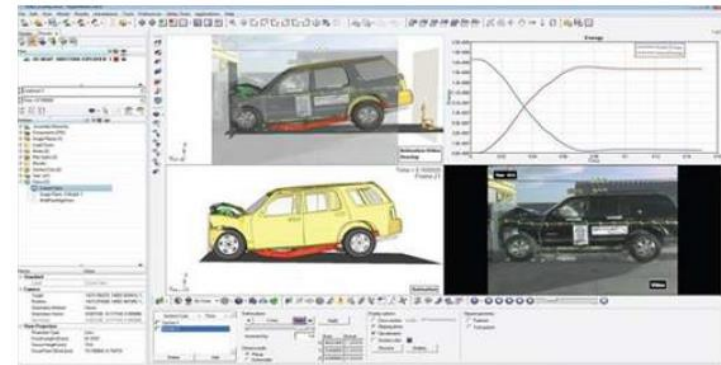
Design and Simulation Lab

Altair Hyperworks

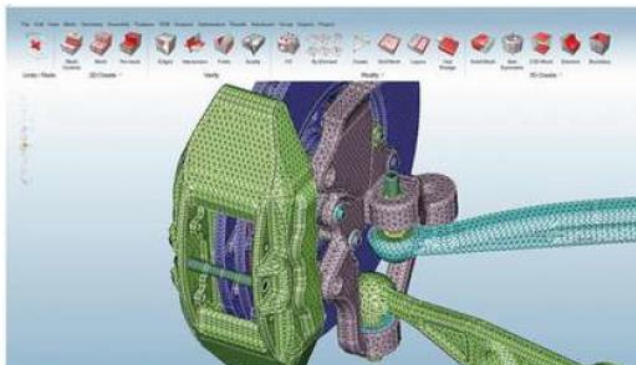
Modules and Capabilities:-



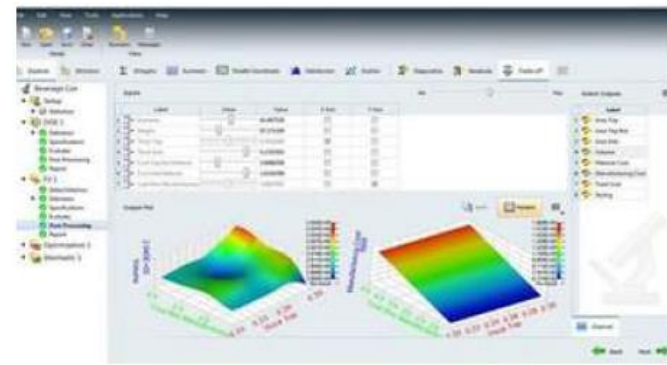
Finite Elements Pre-processor
HYPERMESH



Visualization and Reporting
HYPERVIEW



Process-oriented FE Modeling
SIMLAB

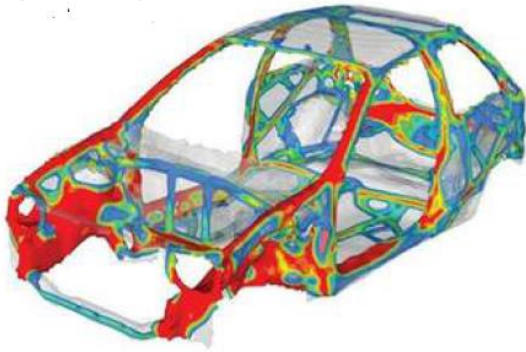


Design Exploration & Optimization
HYPERSTUDY

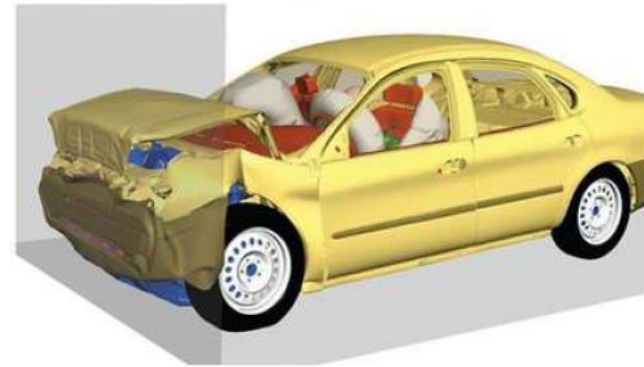
Design and Simulation Lab

Altair Hyperworks

Modules and Capabilities:-



Structural Analysis and Optimization
OPTISTRUCT



Crash, Safety & Impact
RADIOSS



Data Processing and Visualization
COMPOSE



Fatigue Life and Durability
HYPERLIFE

Design and Simulation Lab

Altair Hyperworks

Capabilities:-

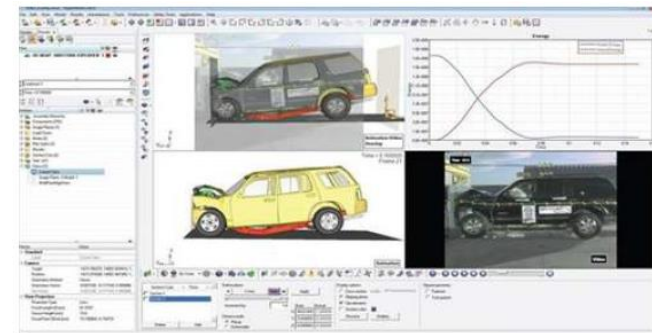
Finite Elements Pre-processor - HYPERMESH

- Streamlined Geometry Import and Model Assembly
- Simplify the creation of large model meshes that adhere to industry requirements
- Use automated meshing tools to cleanup, refine, and create shell, solid, and other mesh types
- Automated Report Generation



Visualization and Reporting - HYPERVIEW

- Seamless Integration with Leading CAE Solvers
- Multi-Page, Multi-Window: Freedom to Explore
- See the Invisible, Uncover Hidden Insights
- Interactive Post-Processing
- Advanced Results Post-Processing
- Customized Post-Processing with Command Recording and Playback



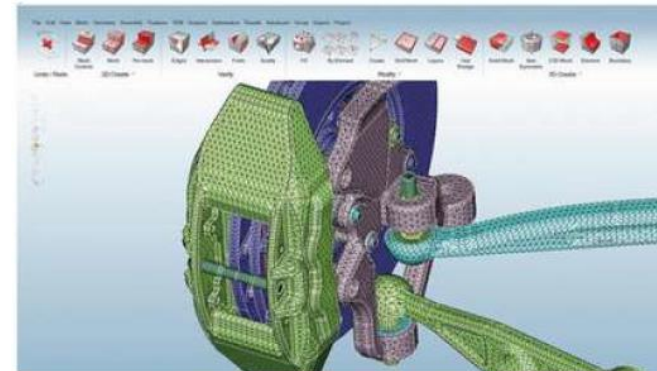
Design and Simulation Lab

Altair Hyperworks

Capabilities:-

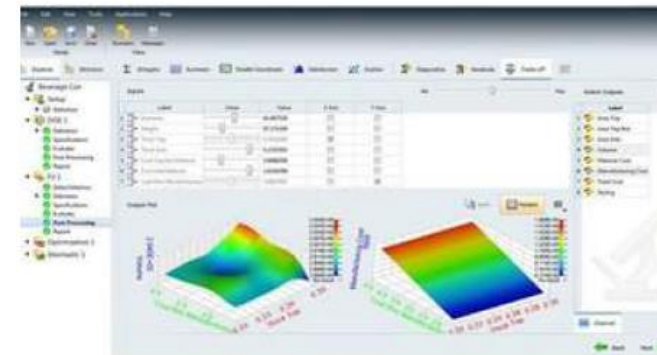
Process-oriented FE Modeling - SIMLAB

- SimLab is a process-oriented multidisciplinary simulation environment
- Empowers users to accurately analyze the performance of complex assemblies
- Deliver consistent, repeatable results with streamlined simulation workflows
- Easily monitor results and convergence to accelerate early-stage design



Design Exploration & Optimization - HYPERSTUDY

- Perform not only CAD-based but also coupled structural, electromagnetics, CFD, thermal, and multi-body dynamics optimization
- Various models and solvers can be linked into a workflow to perform multiphysics design studies
- A step-by-step process guides the user through the study definition and results analysis
- Create intelligent design variants, manage runs, and extract results automatically



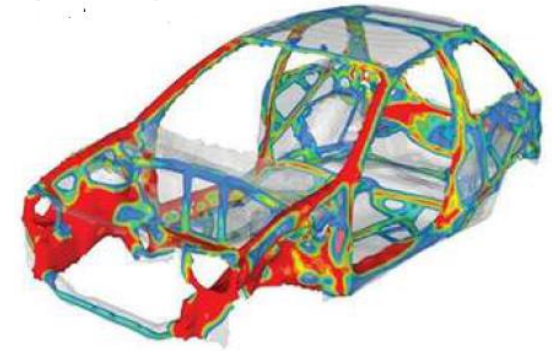
Design and Simulation Lab

Altair Hyperworks

Capabilities:-

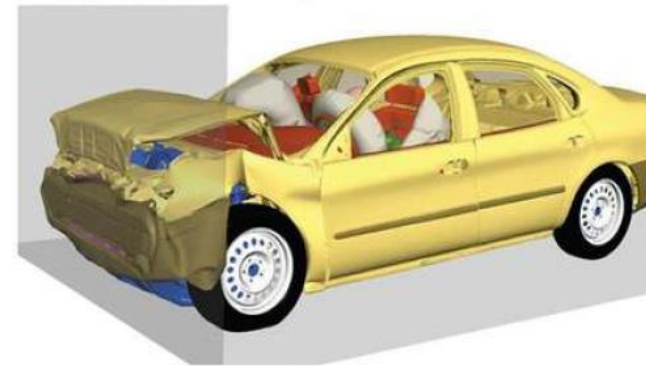
Structural Analysis and Optimization - OPTISTRUCT

- Design, Simulate and Optimize multi-physics systems with a one model, one solver solution
- Structural Optimization
- Material Analysis
- Vibration and Acoustic Analysis
- Comprehensive Nonlinear Analysis
- Real-World Multiphysics



Crash, Safety & Impact - RADIOSS

- Optimize product performance under dynamic load
- Highly nonlinear problems like crash, impact, blast and stamping simulation



Design and Simulation Lab

Altair Hyperworks

Capabilities:-

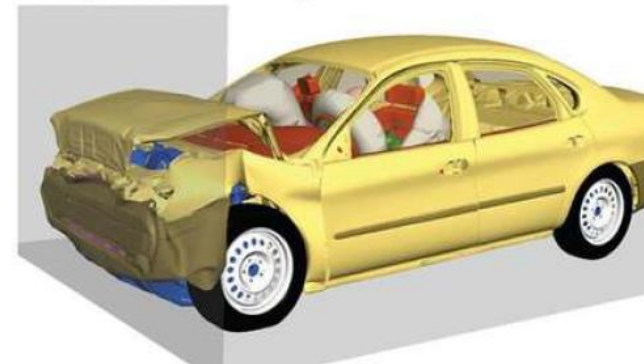
Data Processing and Visualization - COMPOSE

- A powerful, general purpose numerical computing environment
- Develop and perform custom mathematical data operations
- Process Automation and Scripting



Fatigue Life and Durability - HYPERLIFE

- A comprehensive, easy to learn solution for fatigue and durability analysis
- A simple yet robust signal processing within the LoadMap utility
- Weld Fatigue assessment is available for Spot Welds and Seam Welds





Government College of Engineering Yavatmal **Honeywell**

Advance Manufacturing Lab

FFF 3D Printer - Hydra 16 AS





Government College of Engineering Yavatmal **Honeywell**

Advance Manufacturing Lab

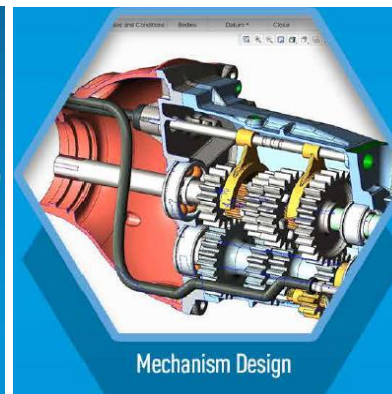
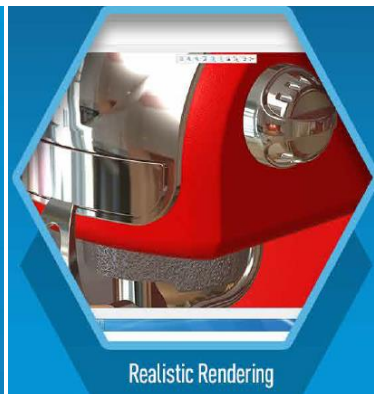
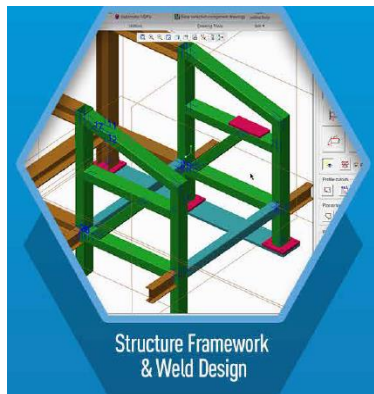
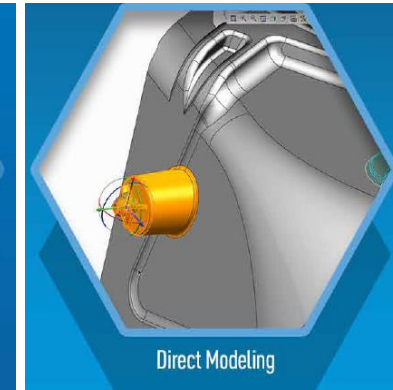
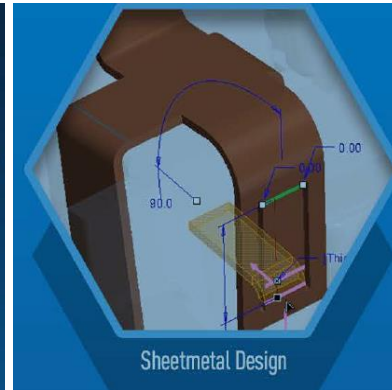
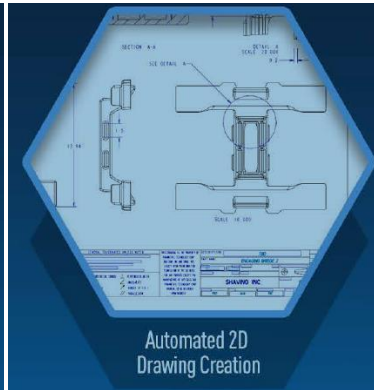
FFF 3D Printer - Hydra 16 AS

Capabilities:-

Design and Simulation Lab

PTC Creo Parametric

Capabilities:-



THANK YOU

REGISTRATION FORM

Name : _____

Branch, Year : _____

Institution : _____

Address for Correspondence:

Telephone: _____

Mobile No. _____

Email: _____

Signature of Applicant: _____

Note:

Participants who successfully complete the training program will be encouraged to submit a small project/report based on the concepts learned during the course. The project should demonstrate practical application of the acquired knowledge and skills in electronics, simulation, or embedded systems. Upon successful evaluation and approval of the submitted project/report, participants will be awarded a **certificate of completion** and project achievement. This initiative aims to promote innovation, hands-on learning, and practical problem-solving abilities among participants.

Seal & Signature of Authority/Head of Institute

Chief Patron

Dr. Vinod M. Mohitkar

Hon. Director, Directorate of Technical Education (DTE)
Maharashtra State, Mumbai.

Patrons

Dr. Dhanpal Kamble

Dy. Director, DTE, Maharashtra State, Mumbai.

Dr. V. R. Mankar

Joint Director, Technical Education
Regional Office, Amravati

Chief Coordinator

Dr. R. K. Rai

Principal, Government College of Engineering, Yavatmal

E-Mail: principal@gcoey.ac.in

Center of Excellence GCOEY Coordinators

Dr. S. R. Kewate (PI CoE)

Dr. S. R. Shiledar (CO-PI CoE)

Coordinators of program

Dr. S. S. Thakre

Asst. Prof and HoD Electronics & Telecommunication
Engineering

Dr. U. D. Dongare

Asst. Professor Electrical Engineering

Advisory Committee

Dr. V. N. Ghate (HoD Electrical Engg.)

Dr. A. I. Dhattrak (HoD Civill Engg.)

Dr. M. Deshmukh (HoD Mechanical Engg.)

Prof. Andhare (HoD Computer)

Technical Training Faculties

Mr. Darshan R

(Software Trainer, AMS India Pvt Ltd)

Mr. Kiran Kumar

(Hardware Design Engineer, AMS India Pvt Ltd)

Supporting Faculties

Mr. Kunal Pawar, Lab assistant

**Government College of Engineering,
Yavatmal**

(Affiliated to DBAT University Lonere, Raigad)

*"To nurture competent engineers for technological and social
advancement"*



Collaborate with

Honeywell

(A Joint Initiative of Honeywell, AMS &
Trisita Engineering LLP & GCOE Yavatmal)

Under Center of Excellence project

Organized

**Two weeks Industrial Training Practice
Session for Students**

on

“Embedded Systems & Circuit Simulation”

27th April to 8th May 2026

Organized by

**Department of Electronics and
Telecommunication Engineering,
Government College of Engineering,
Yavatmal – 445001**

Phone: 072322 38683 Website: www.gcoey.ac.in

About Institute:

The Government College of Engineering, Yavatmal (GCOEY), established in the year 2018, is non-autonomous Institute of Govt. of Maharashtra. The Institute is AICTE approved and affiliated to Dr. Babasaheb Ambedkar Technological university Lonere, Raigad, The institute conducts five undergraduate engineering courses namely Civil, Computer, Electrical, Electronics & Telecommunication, and Mechanical Engineering.

The institute has established a **Center of Excellence (CoE)** on Digitalization through Simulation to provide advanced training and skill development opportunities for students and faculty. The Center of Excellence (CoE) serves as a dynamic platform to bridge the gap between academia and industry by offering advanced laboratories, practical hands-on training, and exposure to emerging digital and simulation technologies. It is dedicated to promoting skill-based education, innovation, and research that enhances the technical and professional competencies of both students and faculty members.

Through specialized certification programs, workshops, internships, and strong collaborations with industry partners, the **CoE** equips learners with practical knowledge and industry-relevant skills. This initiative ensures that students and faculty remain updated with modern technological trends and are prepared to meet

Program overview

This Two-week training program practice session is designed for students to strengthen their understanding of core Electronics & Communication concepts through practical exposure using simulation and embedded programming tools. The program focuses on bridging the gap between theoretical learning and real-world applications using industry-relevant software tools.

real-world engineering challenges, thereby creating industry-ready professionals.

Software Practice Session

- NI Multisim (Circuit Simulation)
- Arduino IDE (Embedded Programming)

Course scope:

Participants will be able to:

- ✓ Design and simulate basic electronic circuits using modern software tools, enabling them to analyze circuit behavior before physical implementation.
- ✓ Understand analog and digital electronics practically through laboratory experiments, component-level studies, and real-time demonstrations.
- ✓ Develop simple embedded applications by working with microcontrollers, sensors, and interfacing techniques for automation and control systems.
- ✓ Apply theoretical knowledge to real-world problems by practicing assignments.

Contents:

- Practice Session on Circuit Simulation, Analog and Digital Electronics
- Practice Session on Embedded System and Arduino Interfacing
- Assignments
- Submission of Assignments

Eligibility of Participants:

Undergraduate Students (ECE / Electrical / Allied)

Outcomes:

Participants will be able to:

- Practice and Submission of Assignments
- Design and simulate basic electronic circuits
- Understand analog and digital electronics practically
- Develop simple embedded applications

• **Fees:** The workshop is fully sponsored by the institute under CoE lab Government College of Engineering Yavatmal, There is no registration charges for the internal students and faculties.

For more information, Contact to

- Mrs. V. R. Godse (Mob. 9730923800)
- Mr. Kunal Pawar (Mob. 9689803731)

Student Coordinators

- Saurabh Manohar Rathod (8010196066)
- Arpita Gitesh Gupta
- Khushi Dhanraj Nikhade
- Ankit Avadhesh Patel

Registration: Participants are requested to register in advance using the enclosed Registration Form

Last Date of Registration: 26th April 2026.

Registration Google Form Link:

<https://forms.gle/e3YLECAXE6fY7deo7>

REGISTRATION FORM

Name : _____

Branch, Year : _____

Institution : _____

Address for Correspondence:

Telephone: _____

Mobile No. _____

Email: _____

Signature of Applicant: _____

Note:

Participants who successfully complete the training program will be encouraged to submit a small project/report based on the concepts learned during the course. The project should demonstrate practical application of the acquired knowledge and skills in Autodesk Fusion 360. Upon successful evaluation and approval of the submitted project/report, participants will be awarded a **certificate of completion** and project achievement. This initiative aims to promote innovation, hands-on learning, and practical problem-solving abilities among participants.

Seal & Signature of Authority/Head of Institute

Chief Patron

Dr. Vinod M. Mohitkar

Hon. Director, Directorate of Technical Education (DTE)
Maharashtra State, Mumbai.

Patrons

Dr. Dhanpal Kamble

Dy. Director, DTE, Maharashtra State, Mumbai.

Dr. V. R. Mankar

Joint Director, Technical Education
Regional Office, Amravati

Chief Coordinator

Dr. R. K. Rai

Principal, Government College of Engineering, Yavatmal

E-Mail: principal@gcoey.ac.in

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Under Center of Excellence project

Organized

**Two weeks Industrial Training Practice
Session for Students**

on

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27th April to 8th May 2026

Organized by

**Dept. of Mechanical Engineering,
Government College of Engineering,
Yavatmal –445001**

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Through specialized certification programs, workshops, internships, and strong collaborations with industry partners, the **CoE** equips learners with practical knowledge and industry-relevant skills. This initiative ensures that students and faculty remain updated with modern technological trends and are prepared to meet

Program overview

This Two-week training program practice session is designed for students to strengthen their understanding of CAD, CAM and CAE through practical exposure using Autodesk Fusion 360 software and Advanced Manufacturing. The program focuses on bridging the gap between theoretical learning and real-world applications using industry-relevant software tools.

real-world engineering challenges, thereby creating industry-ready professionals.

Software Practice Session

- Autodesk Fusion 360 (CAD, CAM, CAE)

Course scope:

Participants will be able to:

- ✓ Develop strong foundation in CAD, simulation, and additive manufacturing.
- ✓ Equip students with hands-on experience using industry-standard tools.
- ✓ Enable integration of design-to-manufacturing workflows into teaching.
- ✓ Prepare for industry-oriented projects and certifications.

Contents:

- Practice Session on Autodesk Fusion 360 software
- Assignments
- Submission of Assignments

Eligibility of Participants:

Undergraduate Students (Mechanical Engineering)

Outcomes:

Participants will be able to:

- Practice and Submission of Assignments
- Develop strong foundation in CAD, CAM and CAE
- Develop strong foundation in Simulation
- Prepare for industry-oriented projects and certifications

- **Fees:** The workshop is fully sponsored by the institute under CoE lab Government College of Engineering Yavatmal, There is no registration charges for the internal students and faculties.

For more information, Contact to

- Mr. M. R. Bhende Mech (Mob. 86238 28151)

Student Coordinators

- Om Balkishan Devade 3rd Yr (9172014171)
- Sumit Kailas Chavhan
- Aniket Duleshwar Lende 2nd Yr (8055675939)

Registration: Participants are requested to register in advance using the enclosed Registration Form

Last Date of Registration: 26th April 2026.

Registration Google Form:

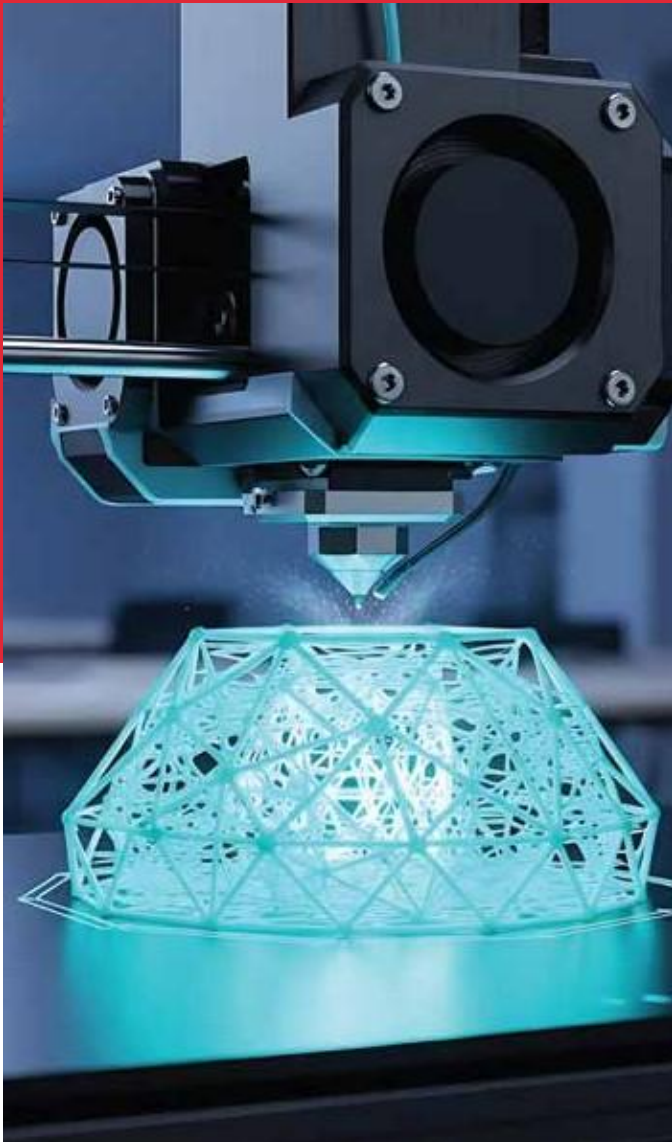
<https://forms.gle/Cdhwanweofz1ZrEq7>



GOVERNMENT COLLEGE OF ENGINEERING -YAVATMAL
(Affiliated to, Dr. Babasaheb Ambedkar Technological University)

CENTRE OF EXCELLENCE ON DIGITALIZATION THROUGH SIMULATION

Engineering Simulation Lab | Additive Manufacturing / 3D Lab



Naringe Nagar, Pimpalgaon,
Yavatmal, Maharashtra 445001

www.gcoey.ac.in

Powered By: **Honeywell Academy**

ADDITIVE MANUFACTURING

COURSE FOR B.TECH STUDENTS

COURSE TYPE -

Theory + Demonstration

TOTAL CONTACT HOURS -

30 Hours
(6 Hours/Day × 5 Days)

PREREQUISITES -

Engineering Graphics & Basic Manufacturing Processes

COURSE OBJECTIVES

- To introduce fundamental concepts and processes of Additive Manufacturing.
- To familiarize students with commonly used AM materials and machines.
- To develop basic Design for Additive Manufacturing (DfAM) skills.
- To understand process parameters, defects, and quality aspects.
- To expose students to industrial applications and career opportunities in AM.

COURSE OUTCOMES	CO No	COURSE OUTCOMES
	CO1	Explain principles and workflow of Additive Manufacturing
	CO2	Classify AM processes and select suitable technology
	CO3	Apply basic DfAM principles for part design
	CO4	Identify AM materials and process parameters
	CO5	Recognize defects, post-processing, and applications of AM

DETAILED SYLLABUS

Unit I

INTRODUCTION TO ADDITIVE MANUFACTURING (6 HOURS)

- Evolution of manufacturing
- Definition, advantages, and limitations of AM
- AM workflow: CAD - STL - Slicing - Printing
- Comparison with conventional manufacturing

Unit II

ADDITIVE MANUFACTURING PROCESSES (6 HOURS)

- Material Extrusion (FDM/FFF)
- Vat Photopolymerization (SLA, DLP, LCD)
- Powder Bed Fusion (SLS, SLM – overview)
- Binder Jetting and Material Jetting (overview)

Unit III

MATERIALS & DESIGN FOR AM (6 HOURS)

- Polymers and composites used in AM
- Introduction to metal and ceramic AM
- DfAM principles
- Support structures, orientation, infill strategies

Unit IV

PROCESS PARAMETERS & QUALITY (6 HOURS)

- Key printing parameters and their effects
- Common defects and troubleshooting
- Dimensional accuracy and surface finish
- Basic post-processing techniques

Unit V

APPLICATIONS & FUTURE TRENDS (6 HOURS)

- Applications in automotive, aerospace, medical, tooling
- Economics of AM (basic cost concepts)
- Introduction to Industry 4.0 & AM
- Future trends and career opportunities

ADVANCED ADDITIVE MANUFACTURING

COURSE FOR M.TECH STUDENTS

COURSE TYPE -

Theory + Demonstration

TOTAL CONTACT HOURS -

30 Hours
(6 Hours/Day × 5 Days)

PREREQUISITES -

Material Science, CAD, CAM & Manufacturing Processes

COURSE OBJECTIVES

- To impart advanced knowledge of AM processes and physics.
- To analyze material behavior and process–structure–property relationships.
- To develop optimization and quality control strategies in AM.
- To evaluate industrial deployment, standards, and certification.
- To prepare students for research and advanced industrial applications.

COURSE OUTCOMES	CO No	COURSE OUTCOMES
	CO1	Analyze AM processes based on physical and thermal principles
	CO2	Evaluate material behavior in polymer, metal, and ceramic AM
	CO3	Apply advanced DfAM and topology optimization concepts
	CO4	Optimize process parameters and assess quality characteristics
	CO5	Critically assess industrial applications, standards, and research trends

DETAILED SYLLABUS

Unit I

FUNDAMENTALS & STANDARDS OF AM (6 HOURS)

- AM classification (ASTM F42 / ISO 52900)
- Process physics and heat transfer basics
- AM workflow and digital thread
- Sustainability and lifecycle analysis

Unit II

ADVANCED AM PROCESSES (6 HOURS)

- Powder Bed Fusion: SLM, EBM
- Directed Energy Deposition (DED, WAAM)
- Multi-material and hybrid AM systems
- Process monitoring and control

Unit III

MATERIALS & DFAM (6 HOURS)

- Rheology of polymers and bio-inks
- Metal powders vs wire feedstock
- Microstructure evolution
- Lattice structures and topology optimization

Unit IV

PROCESS OPTIMIZATION & QUALITY (6 HOURS)

- Thermal stresses and distortion
- Defect mechanisms and mitigation
- Mechanical testing and NDT methods
- Post-processing and qualification

Unit V

INDUSTRIAL DEPLOYMENT & RESEARCH TRENDS (6 HOURS)

- Certification and standards for AM parts
- Cost modeling and scalability
- AI/ML in AM
- Research challenges and thesis topic identification

AUTODESK FUSION 360 EDUCATION SOFTWARE TRAINING PROGRAM

GOVERNMENT COLLEGE OF ENGINEERING -YAVATMAL offers high-level trainings for students, teachers, technical educators, and design instructors **Duration:** 15 Days **Mode:** Hybrid (online + classroom)
Software: Autodesk Fusion 360.

FUSION 360 EDUCATION COURSE SCHEDULE (15 DAYS)

DAYS	MODULE TITLE	KEY TOPICS COVERED
Days 1-2	Introduction to CAD & Fusion 360	CAD basics, Fusion 360 interface, 2D sketching, constraints, basic 3D modeling
Days 3-4	3D Modeling & Parametric Design	Extrude, revolve, sweep, loft, parametric control, sketch patterns, mini projects
Days 5-6	Assemblies & Technical Drawings	Assembly creation, joints, exploded views, technical drawings, annotations
Days 7-8	Simulation & Rendering	Stress analysis, thermal simulation, materials, realistic rendering and animation
Days 9-10	CAM & Manufacturing	Toolpaths, CNC setup, 3D printing workflows, safety, manufacturing best practices
Days 11-15	Capstone Projects & Certification, Practice & Query Sessions	Industry design challenge, portfolio, Autodesk certification prep, final showcase, Practice

COURSE CONTENT

INTRODUCTION TO CAD & FUSION 360

- Overview of CAD/CAM/CAE concepts
- Fusion 360 interface and navigation
- Cloud collaboration and file management
- Basic 2D sketching and constraints

MODELING & PARAMETRIC DESIGN

- Extrude, revolve, sweep, loft
- Parametric modeling and design history
- Sketch patterns and mirroring
- Hands-on mini projects (e.g., phone stand, gear)

ASSEMBLIES & TECHNICAL DRAWINGS

- Assembly creation and joint types
- Exploded views and motion studies
- Creating technical drawings and annotations
- Exporting for manufacturing

SIMULATION & RENDERING

- Static stress analysis
- Thermal and modal simulations
- Material selection and appearance
- Realistic rendering and animation

CAM & MANUFACTURING

- Toolpath generation and setup
- CNC milling and 3D printing workflows
- Fusion 360 with 3D printers
- Safety and manufacturing best practices

CAPSTONE PROJECTS & CERTIFICATION

- Industry-based design challenge
- Portfolio development
- Autodesk certification prep
- Final evaluation and showcase, practice

REQUIRED RESOURCES

- **Fusion Classrooms Setup:** Streamlined onboarding for educators
- Ready-to-use lesson plans and projects
- Live doubt-clearing sessions and webinars
- Access to Autodesk Learning Hub and community forums
- Optional modules: PCB design, generative design, organic modelling

LEARNING FORMATS & EXTRAS

- **Skill Levels:** Beginner, Intermediate, Expert
- **Duration Options:** 2 hours in a day / 5 days / Week
- **Languages Available:** English, Hindi
- **Certification:** Available for select modules if needed

RESOURCES PROVIDED

- Fusion 360 Software materials education links videos, whitepapers.
- Academic webinars and funded curriculum modules
- Weekly assignments and quizzes
- Access on Education software
- Expert Trainer

AUTODESK NETFABB ADDITIVE MANUFACTURING SOFTWARE TRAININGS

Duration: 5 Days | 2 Hours per Day + Practical Sessions

GOVERNMENT COLLEGE OF ENGINEERING -YAVATMAL offers high-level trainings for students, teachers, technical educators, and design instructors **Duration:** 5 Days **Mode:** Hybrid (online + classroom) **Software:** Autodesk Netfabb

COURSE OVERVIEW AND OBJECTIVES

COURSE TITLE:

Autodesk Netfabb Additive Manufacturing Software Training

DURATION:

5 Days
(2 hours per day)

TOTAL HOURS:

10 hours theory +
practical sessions

TARGET AUDIENCE:

Engineering students, Faculty,
Professionals

COURSE OBJECTIVES

01

UNDERSTAND FUNDAMENTALS

of additive manufacturing

02

MASTER NETFABB SOFTWARE

interface and tools

03

LEARN DESIGN OPTIMIZATION

for 3D printing

04

DEVELOP PRACTICAL SKILLS

in model preparation

05

GAIN HANDS-ON EXPERIENCE

with real-world projects

DAY 01 Introduction to Additive Manufacturing & Netfabb Basics

Session Duration: 2 Hours (Theory: 30 min, Practical: 1.5 hours)

Topics Covered:

- Introduction to Additive Manufacturing (AM) technologies
- Overview of 3D printing processes (FDM, SLA, SLS, DMLS)
- Netfabb software interface and workspace
- Basic navigation and tool overview
- File formats and import/export procedures

Practical Session:

- Software installation and setup
- Importing sample 3D models
- Exploring the interface and basic tools
- Hands-on: Load and view different file formats

Query Session:

- Q&A on AM fundamentals
- Software navigation clarifications
- Troubleshooting common import issues

DAY 02 Model Preparation and Mesh Analysis

Session Duration: 2 Hours (Theory: 30 min, Practical: 1.5 hours)

Topics Covered:

- Understanding mesh geometry and topology
- STL file format and mesh quality assessment
- Identifying and fixing mesh errors
- Mesh repair tools in Netfabb
- Orientation and positioning of models
- Support structure basics

Practical Session:

- Importing models with mesh errors
- Using Netfabb repair tools (automatic and manual)
- Analyzing mesh quality metrics
- Hands-on: Repair a defective model
- Positioning models for optimal printing

Query Session:

- Mesh error identification and solutions
- Best practices for model preparation
- Support structure design considerations

DAY 03 Support Structure Design and Optimization

Session Duration: 2 Hours (Theory: 30 min, Practical: 1.5 hours)

Topics Covered:

- Support structure types and selection criteria
- Automatic support generation in Netfabb
- Manual support design and placement
- Support density and material optimization
- Cost and time estimation
- Design for manufacturability (DFM) principles

Practical Session:

- Generating automatic supports for complex models
- Manual support design for critical areas
- Optimizing support structures for material efficiency
- Hands-on: Design supports for a sample part
- Analyzing print time and material usage estimates

Query Session:

- Support structure best practices
- Troubleshooting support-related printing issues
- Cost optimization strategies

DAY 04 **Advanced Features and Process Simulation**

Session Duration: 2 Hours (Theory: 30 min, Practical: 1.5 hours)

Topics Covered:

- Advanced mesh editing and manipulation
- Lattice structures and infill patterns
- Simulation and analysis tools
- Thermal analysis and stress prediction
- Build platform arrangement and nesting
- Multi-part assembly optimization
- Export settings for different 3D printers

Practical Session:

- Creating lattice structures for weight reduction
- Running simulations on complex parts
- Optimizing part placement on build platform
- Hands-on: Arrange multiple parts for efficient printing
- Exporting files in various formats for different printers

Query Session:

- Advanced feature applications
- Simulation interpretation and troubleshooting
- Printer-specific export requirements

DAY 05 **Real-World Projects and Capstone Exercise**

Session Duration: 2 Hours (Theory: 30 min, Practical: 1.5 hours)

Topics Covered:

- Case studies of successful AM implementations
- Industry applications and best practices
- Quality assurance and post-processing
- Troubleshooting common printing failures
- Material selection for different applications
- Cost-benefit analysis of AM vs traditional manufacturing

Practical Session:

- Participants work on a real-world design challenge
- Complete workflow: Import - Repair - Design Supports - Optimize - Export
- Hands-on: Design and prepare a complex part for 3D printing
- Presentation of results and problem-solving approach

Query Session:

- Open discussion on project challenges
- Troubleshooting and optimization tips
- Career opportunities in additive manufacturing
- Course feedback and certification

COURSE REQUIREMENTS AND ASSESSMENT

Prerequisites:

- Basic knowledge of 3D modeling concepts
- Familiarity with CAD software (beneficial but not mandatory)
- Computer with minimum specifications: Intel i5/AMD Ryzen 5, 8GB RAM, 500MB free disk space

Required Materials:

- Autodesk Netfabb software (free student/educational license available)
- Sample 3D model files (provided by instructor)
- Laptop/Desktop computer with Windows/Mac OS
- USB drive for file transfer

Assessment Criteria:

40% **DAILY PARTICIPATION AND PRACTICAL EXERCISES**

30% **MODEL PREPARATION AND OPTIMIZATION TASKS**

30% **CAPSTONE PROJECT COMPLETION AND PRESENTATION**

Certification:

- Participants completing all 5 days and capstone project will receive:
- Certificate of Completion from Government College of Engineering Yavatmal
- Digital badge for Autodesk Netfabb training
- Hands-on experience documentation

Post-Training Support:

- Access to course materials and recorded sessions
- Email support for 30 days after course completion
- Optional advanced workshops and follow-up sessions

INSTRUCTOR INFORMATION AND CONTACT

Lead Instructor:

- Expertise in Additive Manufacturing and CAD/CAM
- Certified Autodesk Netfabb Trainer
- 10+ years of experience in 3D printing and design optimization

Teaching Assistants:

- Support for hands-on practical sessions
- Individual guidance during exercises
- Lab management and technical support

Contact Information:

- Email: training@gcoe-yavatmal.edu.in
- Phone: [College Main Line]
- Office Hours: Available for consultation during course and 30 days post-training

Course Venue:

- Government College of Engineering Yavatmal
- CAD/CAM Laboratory
- Computer Lab with high-performance workstations

Schedule:

- Dates: [To be announced]
- Time: 2 hours per day (Morning or Evening sessions available)
- Days: Monday to Friday (5 consecutive days)

Registration and Enrollment:

- Limited seats: 25 participants per batch
- Registration deadline: [To be announced]
- Enrollment fee: [To be determined by institution]
- Early bird discounts available for group registrations

COURSE SCHEDULE HYPERMESH

PREREQUISITES:

This course is built on the assumption that freshers (to FE meshing) are attending, so no specific prerequisite is necessary. But 3D CAD modeling knowledge is preferable.

TRAINING PHASE:

The course schedule is as follows

DAY 01	I Half	II Half
	<ul style="list-style-type: none"> Introduction & Agenda for the course Hypermesh – <ul style="list-style-type: none"> Role and Capabilities Introduction to HM User Interface File Management Geometry <ul style="list-style-type: none"> Creation & Cleanup Geometry Cleanup – Class Exercises <ul style="list-style-type: none"> Surface model creation Defeature Mid Surface Extraction Exercises 	<ul style="list-style-type: none"> Importance of Meshing Types of Elements Data Management – Collectors Tools – commands 2D Meshing - Planning Exercises

DAY 02	I Half	II Half
	<ul style="list-style-type: none"> General meshing Procedure <ul style="list-style-type: none"> Meshing Specs Meshing – 2D Auto meshing <ul style="list-style-type: none"> Options available for Auto mesh Exercises 	<ul style="list-style-type: none"> Quality Checks - Concepts <ul style="list-style-type: none"> Quantitative & Qualitative Meshes Meshing - Class Exercise for complete meshing procedure

DAY 03	I Half	II Half
	<ul style="list-style-type: none"> 2D Meshing <ul style="list-style-type: none"> Manual Meshing Creation & modifications <ul style="list-style-type: none"> Auto Meshing & Re meshing Exercises on 2D meshing Mid Surface meshing with exercise 	<ul style="list-style-type: none"> 3D Meshing <ul style="list-style-type: none"> Manual Meshing Creation & modifications Mesh check Parameters Assignments on 3D Hexahedron meshing

DAY 04	I Half	II Half
	<ul style="list-style-type: none"> 3D Tetrahedron meshing <ul style="list-style-type: none"> Creation & modifications Assembly Meshing Mesh check Parameters Assignments on 3D Tetrahedron meshing 	<ul style="list-style-type: none"> 1D Elements & Hyper Beam Exercises using 1DElements

DAY 05	I Half	II Half
	<ul style="list-style-type: none"> Analysis using Radioss/Optistruct Analysis Setup for <ul style="list-style-type: none"> Static Analysis Modal Analysis Free-Free Modal Analysis 	<ul style="list-style-type: none"> Doubts Clarification Session Quiz & Review

