SRI MANAKULA VINAYAGAR
ENGINEERING COLLEGE
(AN AUTONOMOUS INSTITUTION)

DEPARTMENT OF MECHATRONICS ENGINEERING

SHAPEMAKERS CLUB

Sri Manakula Vinayagar Engineering College
DEPARTMENT OF MECHATRONICS
SHAPEMAKERS CLUB

ANNUAL REPORT

AcademicYear : 2024-2025

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Preface

The Shapemakers Club of the Department of Mechatronics Engineering, Sri Manakula Vinayagar Engineering College, serves as an innovative and creative platform dedicated to nurturing technical expertise, design thinking, and hands-on learning in the field of 3D printing and additive manufacturing. The club is established with the objective of bridging the gap between conceptual design and practical implementation by enabling students to transform ideas into functional prototypes through advanced digital fabrication technologies. It actively encourages members to explore emerging trends in 3D modeling, rapid prototyping, product development, and smart manufacturing through workshops, technical training programs, expert lectures, project-based learning, design competitions, and interdisciplinary collaborations. By fostering creativity, innovation, problem-solving skills, and teamwork, the club aims to equip students with industry-relevant competencies and entrepreneurial mindsets required in modern manufacturing and product design sectors. The smooth functioning of the club is ensured by a dedicated team of office bearers, including the President, Vice President, Treasurer, Technical Head, and Design Lead, who work collectively with enthusiastic members to plan, organize, and execute various technical and co-curricular activities throughout the academic year. Through continuous learning, innovation-driven initiatives, and industry-oriented exposure, the Shapemakers Club strives to develop technically proficient, socially responsible, and professionally competent engineers while contributing to the academic excellence and technological advancement of the institution.

Faculty Coordinator
Mr. S. Prakash

HoD/ MCTR
Dr. G.B.M. Mohan Raj

IQAC Coordinator
Dr. Arivalagar A A

Director Cum Principal
Dr.V.S.K. Venkatachalapathy

ABOUT THE INSTITUTION

Sri Manakula Vinayaga Educational Trust was founded to provide quality and affordable education to the weaker sections of society. The trust established Sri Manakula Vinayagar Engineering College (SMVEC) in 1999. SMVEC is an autonomous institution affiliated to Pondicherry University. It offers 13 undergraduate, 8 postgraduate and 11 Research programs in engineering. SMVEC has been accredited by NAAC with "A" grade and NBA. The institution is also accredited by TATA consultancy services. The college has a good placement record with students getting job offers from top companies in India and abroad. SMVEC students have won many awards and accolades for their academic achievements. To be globally recognized for excellence in quality education, innovation and research for the transformation of lives to serve the society.

VISION

- To nurture the cornerstone of excellence in engineering education and drive innovation by seamlessly integrating the fundamentals of Science and Humanities

MISSION

M1: Quality Education : To provide comprehensive academic system that amalgamates the cutting edge technologies with best practices.
M2: Research and Innovation : To foster value-based research and innovation in collaboration with industries and institutions globally for creating intellectuals with new avenues.
M3: Employability and Entrepreneurship : To inculcate the employability and entrepreneurial skills through value and skill based training.
M4: Ethical Values : To instill deep sense of human values by blending societal righteousness with academic professionalism for the growth of society.

ABOUT THE DEPARTMENT

The Bachelor of Technology in Mechatronics Engineering (MCTR) programme prepares students for a rapidly changing technological landscape. This programme focuses on both internet networking and broadband communication, offering a thorough grasp of data transport across wired and wireless channels. Our curriculum prepares graduates to excel and innovate in global data networks, enabling safe communication and information exchange via text, phone, or video.

VISION

- To be a department with outstanding competencies in education and research in interdisciplinary field of Mechatronics Engineering for the prosperity of students and society.

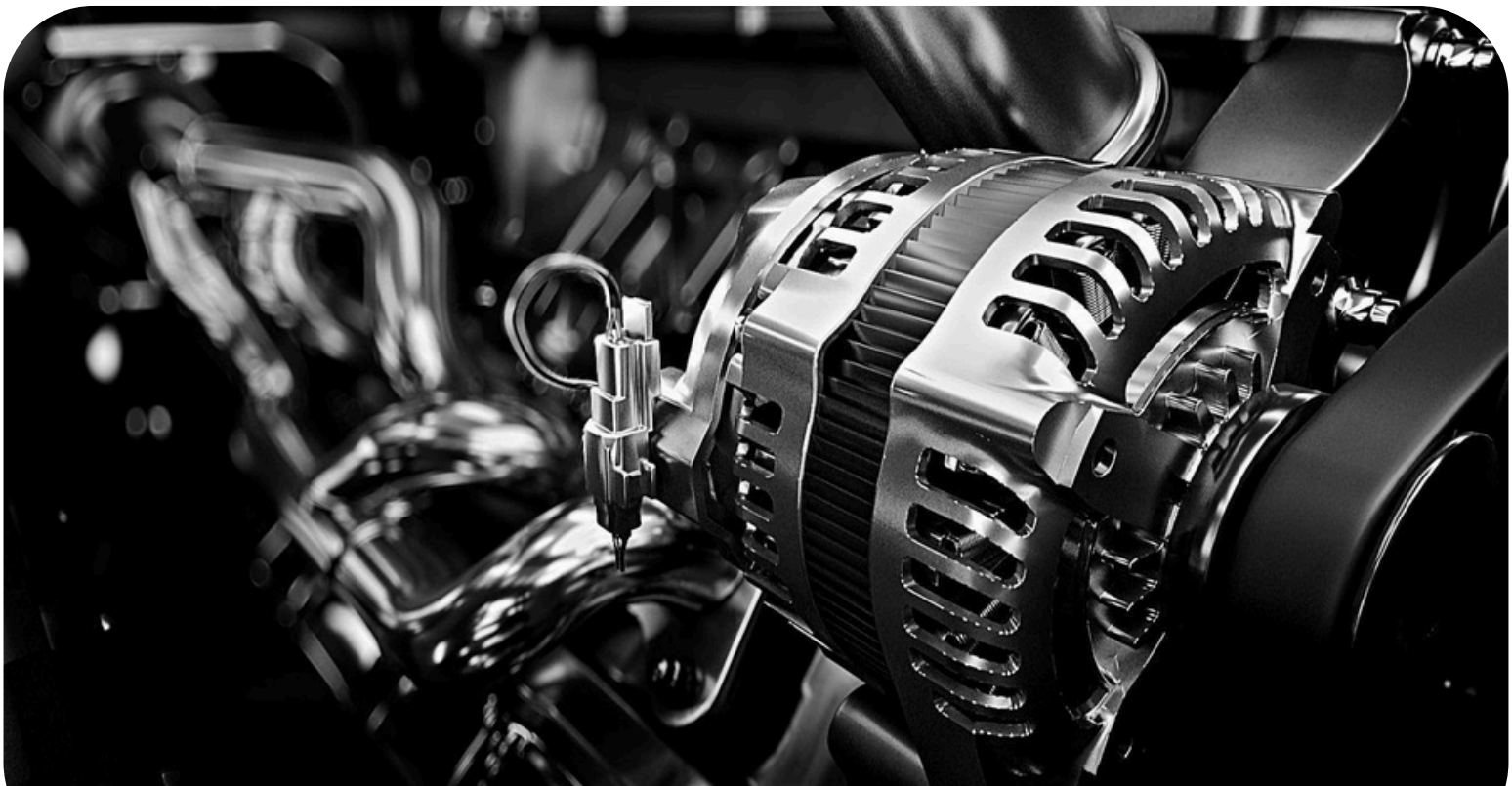
MISSION

M1 - Quality Integration: To uphold excellence in education by integrating the teaching learning process with handson trainings in updated technologies.

M2 - Research Exploration: To maintain a dynamic balance between learning and research by encompassing activities related to Research, Industrial projects and Innovation Contests.

M3 – Personality Development: To enrich the team spirit and entrepreneurship skills through training programmes on personality development for career prospects.

M4 – Social Ethics: To enhance the principle of highest ethical values by inculcating code of conduct for the betterment of the Society.



ABOUT ELDRIDA INNOVATORS CLUB

The Shapemakers Club is a student-driven 3D printing and digital fabrication community dedicated to transforming ideas into tangible creations. The club focuses on additive manufacturing technologies, 3D modeling, prototyping, and product design, providing members with hands-on experience in turning concepts into real-world objects.

Shapemakers Club organizes workshops, seminars, design challenges, competitions, and practical training sessions centered on 3D printing and emerging fabrication technologies. The club helps students prepare for future careers in engineering, product design, architecture, robotics, and other technology-driven fields by building strong technical foundations and problem-solving skills.

VISION

- To become a center of excellence in 3D printing and digital fabrication within the institution.
- To empower students to transform innovative ideas into functional prototypes and real-world solutions.
- To cultivate a culture of creativity, design thinking, and technological innovation.
- To inspire students to pursue careers and entrepreneurship in additive manufacturing and emerging technologies.

MISSION

- To promote and enhance practical skills in 3D modeling, additive manufacturing, and prototyping.
- To provide hands-on training and real-world exposure to 3D printing technologies.
- To create opportunities for students to showcase their designs, innovations, and technical expertise.
- To organize workshops, competitions, and collaborative projects that foster creativity and problem-solving.
- To encourage research, experimentation, and entrepreneurial thinking in product development.
- To develop leadership, teamwork, and communication skills among members.
- To build a collaborative community that supports innovation, technical excellence, and personal growth.

ABOUT SHAPEMAKERS CLUB

The Shapemakers Club is guided by a dedicated team of office bearers who play a crucial role in shaping the club's vision and advancing its focus on 3D printing and digital fabrication. The leadership team consists of a Head of the Club, President, Vice President, Secretary, Treasurer, Design Lead, Technical Lead, and Project Coordinators, each contributing specialized skills and responsibilities to ensure the smooth functioning of the club. They plan and organize workshops, hands-on training sessions, prototyping challenges, design competitions, and technical exhibitions centered on 3D modeling and additive manufacturing. The team manages fabrication resources, oversees 3D printer operations and maintenance, mentors members in CAD design and product development, and coordinates innovative projects from concept to prototype. Through their collective leadership and collaboration, they foster a culture of creativity, precision, experimentation, and problem-solving, ensuring that the Shapemakers Club remains a dynamic platform for skill development, innovation, and future-ready makers.

Mrs.S.Jagan
Assistant Professor
Faculty Coordinator

Paranjothi A
Head of the Club
IV/A

Benson Nestor
Lebel E
President IV/A

Jeevabaskar A
Vice President IV/A

LIST OF EVENTS

S.No.	Title
01	3D Printer Mechanical Assembly and Structural Integration
02	Structural Building and Technical Print Optimization

3D PRINTER MECHANICAL ASSEMBLY AND STRUCTURAL INTEGRATION

During this practical session, students focused on the mechanical construction of the 3D printer, meticulously assembling the aluminum extrusion frame and integrating critical drive components such as the Z-axis lead screws and Y-axis guide rails. The activity emphasized structural integration, where students ensured the precise alignment of the gantry and build platform to maintain rigidity and prevent mechanical play. By connecting the hardware with the control interface, they gained a deep understanding of how structural stability directly influences print accuracy and overall machine performance.

- Date of the Event: 24.03.2025
- Year Of Student: I, II, III & IV
- Venue: ROBOTICS Lab, Mctr dep.
- Number of Participants: 56
- Mode Of Event: Offline
- Event Incharge: Ms.S.Jagan

OBJECTIVES OF ACTIVITY

- To help students understand how to design strong and stable 3D printed models.
- To teach students how wall thickness, infill, supports, and print orientation affect strength and material usage.
- To train students in adjusting print settings like layer height, speed, temperature, and cooling.
- To improve students' ability to reduce print errors and improve surface quality.
- To enable students to create efficient, durable, and high-quality 3D printed parts.

OUTCOMES OF THE ACTIVITY

- Identify and understand the mechanical components of a 3D printer, including frames, motion systems, and fasteners.
- Assemble the printer structure accurately to ensure rigidity, alignment, and mechanical stability.
- Integrate linear motion components such as rails, belts, and lead screws for smooth and precise movement.
- Analyze the impact of structural alignment on print accuracy and overall machine performance.
- Apply proper mechanical practices to reduce vibration, backlash, and wear in printer assemblies.
- Demonstrate safe and systematic assembly techniques while following engineering drawings and instructions.

PHOTO GALLERY

STRUCTURAL BUILDING AND TECHNICAL PRINT OPTIMIZATION

This topic focuses on designing and building structurally sound 3D printed models while optimizing technical printing parameters for performance and reliability. Students learn how design choices such as wall thickness, infill patterns, supports, and orientation affect strength, durability, and material usage. The topic also covers fine-tuning print settings like layer height, speed, temperature, and cooling to achieve optimal surface quality and dimensional accuracy. By combining structural design principles with print optimization techniques, learners gain the ability to produce efficient, high-quality, and application-ready 3D printed components.

- Date of the Event: 12.04.2025
- Year Of Student:I,II,III & IV
- Venue: MCTR II nd year Classroom
- Number of Participants: 56
- Mode Of Event:Offline
- Event Incharge: Mr. S. Jagan

OBJECTIVES OF ACTIVITY

- o provide students with a comprehensive understanding of structural design principles in 3D printing, focusing on strength, stability, and load-bearing considerations.
- To train students in optimizing design parameters such as wall thickness, infill patterns, support structures, and print orientation to enhance durability and material efficiency.
- To develop the ability to analyze how different structural configurations influence mechanical performance and overall print reliability.
- To enhance knowledge of critical print optimization parameters including layer height, print speed, temperature control, cooling settings, and material flow.

OUTCOMES OF THE ACTIVITY

- Understand structural design principles such as wall thickness, infill patterns, and part orientation for 3D printing.
- Analyze how design and printing parameters influence strength, durability, and material efficiency.
- Optimize technical print settings including layer height, temperature, speed, and cooling for improved quality.
- Design and apply appropriate support structures to ensure successful and accurate prints.
- Evaluate printed components for dimensional accuracy, surface finish, and structural integrity.
- Apply optimization techniques to reduce print failures, material waste, and production time.

PHOTO GALLERY