FRANCIS XAVIER ENGINEERING COLLEGE
AN AUTONOMOUS INSTITUTION

Accredited BY NBA | AICTE Sponsored Margdarshan Mentor Institution
DST-FIST Supported Institution | ISO 9001:2015 Certified
Recognized under Section 2(f) & 12(B) of the UGC Act, 1950

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DEPARTMENT OF MECHANICAL ENGINEERING
MONTHLY NEWS – MAY 2024

ABOUT DEPARTMENT OF MECHANICAL ENGINEERING

The department offers UG program in B.E Mechanical engineering from the year 2005. The department started a PG program M.E Industrial Safety Engineering from this academic year 2018- 2019. This course has wide range of job opportunity in the Industrial and Academic sector of India as well as abroad. The Department aims at providing the students with a perfect blend of intellectual and practical experiences with the support state-of the-art laboratories and well-defined academic structure. The UG program is accredited by National Board of Accreditation (NBA). The special feature of the Department has established three applied laboratories, in addition to the regular labs to support students to master skills to make each one industry-ready, with a solid grounding in the principles and practice of Mechanical Engineering. We also have a strong academy for training students to appear for GATE exam.

VISION OF THE DEPARTMENT

To produce competent Mechanical Engineers of excellent technical and managerial skills with profound morality for global, national and confront societal development.

Edited & Designed by Dr. K. Vinukumar, AP/Mech, FXEC SOCIAL MEDIA /FXEC Mechanical

MISSION OF THE DEPARTMENT

1. To provide quality education in Mechanical Engineering with an interdisciplinary approach, encouraging innovation, research, and Entrepreneurship through world-class infrastructure and proficient teachers.

2. To make the department self-reliant through multiple programs with excellent curricula, best practices, and industry exposure.

3. To inculcate technical, professional, and leadership skills, moral ethics, and lifelong learning.

Programme Educational Outcomes

The Bachelor of Mechanical Engineering curriculum is designed to impart Knowledge, Skill, and Attitude to the graduates to

PEO 1: Have a successful professional career in Mechanical Engineering and allied industries, either by employment or through entrepreneurship.

PEO 2: Establish competency in Design, Thermal, Materials, and Manufacturing system with ethics and social responsibility.

PEO 3: Have a continual receptiveness for leadership and social challenges.

Message from the Head of the Department

Dear Colleagues,

Greetings!

I have great pleasure and pride in announcing that the Department of Mechanical Engineering is publishing the newsletter for the month of May 2024. We are steadfast in our progress as it involved various activities that enabled the hidden talents of the department students and faculty members to be brought to light. Besides the lockdown, our faculty members are continuously attending various training programs, publishing research papers, and book chapters, and are also working on getting patents.

This newsletter is the reflection of department activities that showcase all the events held in the department, the contributions of faculty members, and students, and the best practices adopted. I would like to congratulate all the members of the editorial board for their sincere effort to realize this venture.

Dr. R. Samuel Hansen, M.E., Ph.D.
Professor & Head
samuel_hansen@rediffmail.com

Edited & Designed by Dr. K. Vinukumar, AP/Mech, FXEC SOCIAL MEDIA /FXEC Mechanical

GUEST LECTURE / SEMINAR / SKILL TRAINING

Open Source,Open Minds: The Philosophy Behind OpenFOAM

FX Alumni Association organized a guest lecture in association with department of Mechanical Engineering for the Third year Mechanical students. **Er.M.Santhana Raja.,Software Engineer., CRUD Operations Pvt. Ltd., Chennai.,** delivered the guest lecture on **"Open Source,Open Minds: The Philosophy Behind OpenFOAM"**. A heartfelt greeting to the resource person is extended by Dr. R. Samuel Hansen, HOD-MECH. The expert resource thanked the management for offering him this opportunity. The guest lecture provided an enlightening exploration into the underlying principles and philosophy driving the

development and adoption of OpenFOAM. It was an open-source computational fluid dynamics (CFD) software and innovation within the engineering community. It commenced with an introduction to the concept of open source and its significance in the realm of software development and innovation.

Introduction to AutoDesk

FX Alumni Association organized a guest lecture in association with department of Mechanical Engineering for the Third year Mechanical students. **Er.S.Palani Vel.,Supervisor., Appasamy Associates., Pondicherry.,** delivered the guest lecture on **"Introduction to AutoDesk"**. A heartfelt greeting to the resource person is extended by Dr. R. Samuel Hansen, HOD-MECH. The expert resource thanked the management for offering him this opportunity. The guest lecture on Introduction to Autodesk provided a comprehensive overview of the pioneering

software company and its impact on various industries, particularly in design and creation. The lecture highlighted the widespread adoption of Autodesk software across various sectors, including architecture, engineering, construction, manufacturing, media, and entertainment. Attendees gained insights into how Autodesk tools are used to streamline workflows, enhance collaboration, and drive innovation in these industries.

Igniting the Young Minds Towards Entrepreneurship

Dr. K..Vinukumaran Assistant Professor, Department of Mechanical Engineering Francis Xavier Engineering College Organized by Entrepreneurship Development Cell & Institution's Innovation Council.This initiative aims to inspire and empower young minds towards entrepreneurial thinking and innovation. Through expertise and guidance, students will be exposed to the tools, insights, and motivation needed to pursue entrepreneurial ventures, fostering creativity and a spirit of innovation in the field of engineering.

IA Training

We are delighted to announce that Dr. J. Sangilimuthukumar has successfully completed the "IA Training" course at the foundation level as part of the EDC Program. This training provided essential skills and knowledge in Industrial Automation, further enhancing expertise in the field. Congratulations to Dr. Sangilimuthukumar on this achievement and continued professional development.

Ministry of Education
Government of India

MoE's INNOVATION CELL
(GOVERNMENT OF INDIA)

innovative bharat

INSTITUTION'S INNOVATION COUNCIL

This is to certify that

of

has undergone Innovation Ambassador (IA) training 'Foundation Level'
(Total 16 Sessions of 30 contact hours) conducted in online mode by MoE's
Innovation Cell & AICTE during the IIC calendar year .

Dr. Abhay Jere
Chief Innovation Officer
MoE's Innovation Cell

Mr. Dipan Sahu
Assistant Innovation Director
MoE's Innovation Cell

Date:

E-certification No.:

IIC ID:

Design-Driven Innovation: How Entrepreneurs Can Lead with Creativity

A “Design-Driven Innovation: How Entrepreneurs Can Lead with Creativity” was organized by Entrepreneurship Development Cell & Institution’s Innovation Council in association with the Department of Mechanical Engineering on 30th May, 2024 at 09:15 am to 12.15 pm. The program was held via offline mode. Mr.S.M.Sunder Rajan, AP/MECH inaugurated the session with welcome address. Begin by defining design-driven innovation and explaining its importance for entrepreneurs. Highlight the crucial role of creativity in differentiating products and services in a competitive market. Can integrate design-driven innovation into the development of new mechanical systems or devices. This might involve collaborating with engineers and designers to create prototypes of new mechanical components, conducting user testing and gathering feedback to refine these prototypes, and staying informed about the latest materials and manufacturing processes to push the boundaries of what is possible in mechanical design.

APPLIED LAD / PATENT PUBLISHED

Patent Published

Research Article

An Experimental Study of the Properties of Carbon Fiber/Epoxy Composites Mixed with Rubber Granules by MR. J.Jeremy Jeba Samuel Joseph Jebaraj

In this research work, the mechanical properties of hybrid composites reinforced with woven carbon fiber mats particulated with natural rubber powders as fillers in the epoxy resin matrix were investigated. The specimens were prepared by the hand-layup process followed by a vacuum bag moulding process. The vacuum moulding reduces the voids or cavities in the hybrid composites. The natural rubber powder was added in different weight proportions (5%, 10%, 15%, and 20%), and carbon fiber is added in 20% for all the specimens. Experiments such as tension testing, flexural testing, water absorption/acid corrosion/ base corrosion tests, dynamic mechanical analysis (DMA), and scanning electron microscopic (SEM) analysis were conducted to evaluate the epoxy carbon rubber (ECR) composites. The tensile and flexural test findings demonstrated that the addition of 10% natural rubber particles gave better results as compared with other proportions. The water/acid/base absorption test findings reveal that the ECR composites are not affected by water/acid/base. The DMA teat findings show that ECR composites having 10% natural rubber have higher damping factor, storage, and loss modulus. The SEM analysis shows that ECR hybrid

composites with 10% rubber particles contained a uniform distribution of rubber particles over reinforcement, and also, there were no cracks and voids. According to this research findings, ECR hybrid composites with 10% natural rubber particles prepared during the vacuum bag moulding process can be used to prepare aerospace interior components.

LASER BASED SECURITY SYSTEM

We are thrilled to announce that the first-year students of the Mechanical Engineering Department have successfully published a patent for their innovative project titled "Laser-Based Security System". This cutting-edge technology demonstrates the creativity and technical prowess of our students and reflects the spirit of innovation fostered in our institution. Congratulations to the team for their achievement, and we look forward to seeing more groundbreaking innovations in the future.

Aakruti Global 2024

The BS SOLIDWORKS User Group Network and D'S SOLIDWORKS Chennai are excited to present Aakruti Global 2024 - Meet 4, an exclusive event to hear from the Winner of 2023. This session will feature insightful presentations from Mr. Krishna Prasanth, UGL, C-SWUG, SOLIDWORKS & 3DX Edu Student Champion, Chennai, India, and Pravin P, Industry Process Consultant, 3DX Edu Student Champion at Dassault Systèmes, Chennai, India. The event will take place on 11th May 2024 at 06:30 PM IST. This gathering will offer attendees an opportunity to gain valuable knowledge from industry leaders, learn about the latest advancements in SOLIDWORKS and 3DX Edu technologies, and engage with fellow professionals and students passionate about design and innovation.

The Cairo SOLIDWORKS User Group is hosting an informative session titled "All You Need to Know About Aakruti" featuring insights from the AAKRUTI 2023 Winner. The event will be hosted by Alex SWUG, with special presentations from Mohamed Hussein, the Aakruti 2023 Winner, and Pravin P, Industry Process Consultant and 3DX Edu Student Champion at Dassault Systèmes. This session will provide valuable information about the Aakruti competition, highlighting the innovative solutions and creative projects that emerged from the 2023 edition, offering a unique opportunity for attendees to learn directly from the winners and experts in the field.

The Design Grant with Design Number 404220-001 has been awarded for the innovative project titled "Decorative Power Window". The team behind this outstanding design consists of:

- Gifton Raj D, IV B.E Mech
- Joel Raj A, IV B.E Mech
- Pravin P, IV B.E Mech
- Manoj Kumar B, IV B.E Mech
- Padmanandam, IV B.E Mech

This project was developed under the guidance of Dr. M. Kannan, Professor, Department of Mechanical Engineering, and was a part of the Design and Analysis Industrial Applied Lab at FXEC, where creativity meets technical excellence. The design showcases the team's skill, innovation, and determination, and embodies "The Toppers' Choice, Be with the Best". Congratulations to the entire team for their success.

The Design Grant with Design Number 404222-001 has been awarded for their innovative project titled "Spherical Milling Machine". The dedicated team members behind this cutting-edge design are:

- Pravin P, IV B.E Mech
- Manoj Kumar B, IV B.E Mech
- Joel Raj A, IV B.E Mech
- Lewish Festus Graceton J, IV B.E Mech
- Esakki Selvam T, III B.E Mech
- Christuraja Kumar, III B.E Mech

This project has been developed under the mentorship of Dr. M. Kannan, Professor, Department of Mechanical Engineering, and is part of the AICTE Sponsored

Margdarshan Mentor Institution initiative at Francis Xavier Engineering College, an autonomous institution located in Vannarpettai, Tirunelveli. The team has demonstrated outstanding creativity and technical expertise in developing the Spherical Milling Machine, a project that reflects the institution's commitment to innovation and excellence in engineering. Congratulations once again to the team for their remarkable success!

पेटेंट कार्यालय, भारत सरकार The Patent Office, Government Of India
डिजाइन के पंजीकरण का प्रमाण पत्र | Certificate of Registration of Design

ORIGINAL

डिजाइन सं. / Design No. : 404222-001
तारीख / Date : 10/01/2024
परस्परिकता तारीख / Reciprocity Date* :
देश / Country :

प्रमाणित किया जाता है कि संलग्न प्रति में वर्णित डिजाइन जो *SPHERICAL MILLING MACHINE* से संबंधित है, का पंजीकरण, श्रेणी 15-09 में 1.Dr. M. Kannan 2. Pravin P 3.Manoj Kumar B 4.Joel Raj A 5.Lewish Festus Graceton J 6.Esakki Selvam T 7.Christuraja Kumar के नाम से उपर्युक्त संख्या और तारीख में कर लिया गया है।

Certified that the design of which a copy is annexed hereto has been registered as of the number and date given above in class 15-09 in respect of the application of such design to *SPHERICAL MILLING MACHINE* in the name of 1.Dr. M. Kannan 2. Pravin P 3.Manoj Kumar B 4.Joel Raj A 5.Lewish Festus Graceton J 6.Esakki Selvam T 7.Christuraja Kumar.

डिजाइन अधिनियम, 2000 तथा डिजाइन नियम, 2001 के अध्यधीन प्रावधानों के अनुसरण में।
In pursuance of and subject to the provisions of the Designs Act, 2000 and the Designs Rules, 2001.

जारी करने की तिथि / Date of Issue 07/05/2024

नियंत्रक जनरल, डिजाइन और व्यापार चिह्न
Controller General of Patents, Designs and Trade Marks

*प्रारंभिकता तारीख (यदि कोई हो), जिसकी अनुमति दी गई है तथा देश का नाम। डिजाइन का सामान्यतिकार पंजीकरण की तारीख से दस वर्षों के लिए होगा जिसका विस्तार, अधिनियम एवं नियम के निबंधनों के अधीन, पाँच वर्षों की अतिरिक्त अवधि के लिए किया जा सकेगा। इस प्रमाण पत्र का उपयोग विधिक कार्यवाहियों अथवा विदेश में पंजीकरण प्राप्त करने के लिए नहीं हो सकता है।

The reciprocity date (if any) which has been allowed and the name of the country. Copyright in the design will subsist for ten years from the date of Registration, and may under the terms of the Act and Rules, be extended for a further period of five years. This Certificate is not for use in legal proceedings or for obtaining registration abroad.

INDUSTRY INTERACTIONS

We would like to extend our heartfelt gratitude to you and the entire Mechanical Department faculty for your invaluable assistance during our recent visit to discuss the technical issue with our storage water heater. Your expertise, prompt attention, and thoughtful guidance have greatly contributed to resolving the concerns we encountered. We appreciate the time and effort you dedicated to thoroughly assessing the situation and providing practical solutions. It is truly reassuring to know that we can rely on such knowledgeable and supportive professionals, and we are grateful for your continued support.

Venus Home Appliances (P) Ltd.
Regd. Office & Factory :
554-A, Senthilampannai, Tuticorin - 628103.
Tuticorin Dist., Tamilnadu, India.
Ph: +91-461-2271891/ 2271894, Fax: +91-461-2271890
Email: purchase@venushomeappliances.com

VENUS™

Dt: 17/05/2024
Tuticorin.

To

Dr.Samual Hansen,
HOD - Mechanical Engineering,
Francis Xavier Engineering College,
Tirunelveli.

Dear sir,

Subject: Thank you for Your Support on Our Water Heater Issue

We would like to extend our heartfelt gratitude to you and the entire Mechanical Department professors for your invaluable assistance during our recent visit to discuss the technical issue with our storage water heater.

Discussed Points:

We face a problem with simple tightening of bolt and nut with a gasket in between.

Problem No 1:
The torque set on day 1 (8Nm) varies on day 2. We think that the variation is due to the soft gasket in between. Our question: In case of soft joint, the torque can reduce on its own?

Problem No 2:
When tightened with 8Nm torque on all six nuts, the plate bends. Since the finished product does not leak, we had never bothered about the plate bending. Our customer from Europe does not accept the plate bending and wants us to increase the component's strength. our question: Plate bending when tightened with multiple bolts& nuts is acceptable or not?

Guidance form your side:
Your guidance and suggestions were incredibly insightful and helpful in addressing the challenges we were facing. Your expertise and dedication to your field were evident throughout our discussion, and we left feeling much more confident in how to approach the issue moving forward.

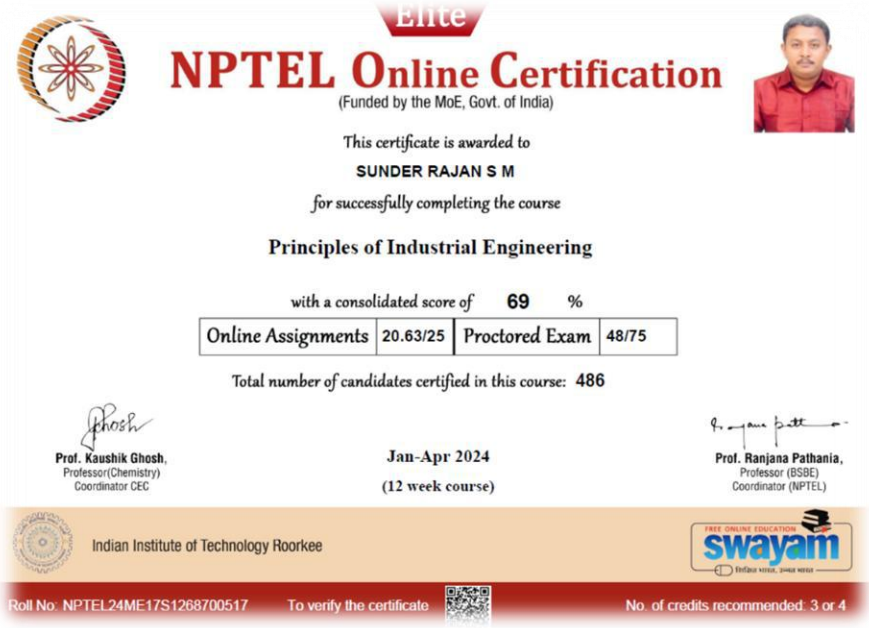
We deeply appreciate the time you took out of your busy schedule to meet with us and share your knowledge. Thank you once again for your kindness, support, and expertise. We look forward to implementing your suggestions and keeping you updated on our progress.

With Best Regards,

Syed Abdur Rahman
(Head - Product Development)
Venus Home Appliances pvt ltd, Tuticorin.

Edited & Designed by Dr. K. Vinukumar, AP/Mech, FXEC SOCIAL MEDIA /FXEC Mechanical

NPTEL



Elite

NPTEL Online Certification

(Funded by the MoE, Govt. of India)

This certificate is awarded to

SUNDER RAJAN S M

for successfully completing the course

Principles of Industrial Engineering

with a consolidated score of 69 %

Online Assignments	20.63/25	Proctored Exam	48/75

Total number of candidates certified in this course: 486

Prof. Kaushik Ghosh,
Professor(Chemistry)
Coordinator CEC

Jan-Apr 2024

(12 week course)

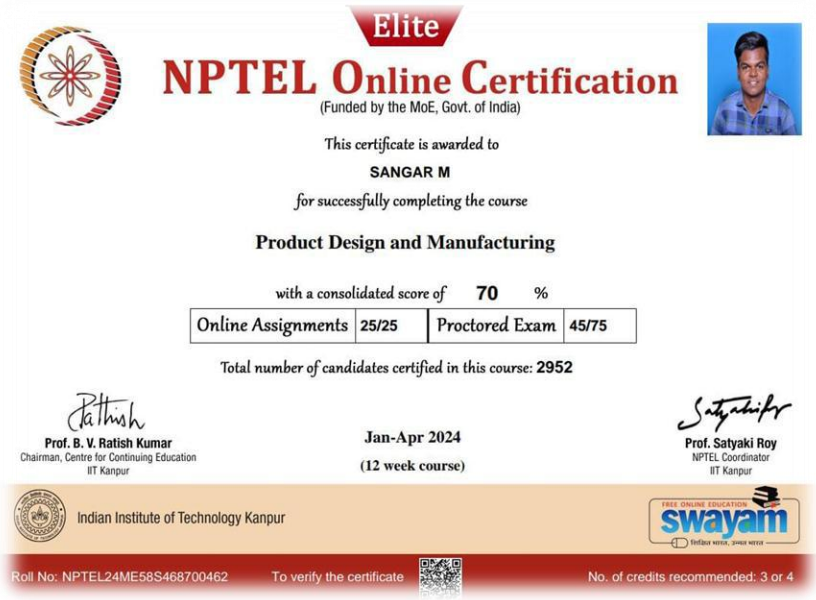
Prof. Ranjana Pathania,
Professor (BSBE)
Coordinator (NPTEL)

Indian Institute of Technology Roorkee

swayam

Roll No. NPTEL24ME17S1268700517 To verify the certificate No. of credits recommended: 3 or 4

The NPTEL Online Certification, funded by the Ministry of Education, Government of India, has been awarded to SUNDER RAJAN S M for successfully completing the course Principles of Industrial Engineering. He achieved a consolidated score of 69%, with a performance breakdown of 20.63/25 for online assignments and 48/75 in the proctored exam. A total of 486 candidates were certified in this course.



The NPTEL Online Certification, funded by the Ministry of Education, Government of India, has been awarded to 19 student for successfully completing the NPTEL course.