Volume

# Mechanical Engineering

**Saintgits College of Engineering** Pathamuttom 686532 Kottavam, Kerala



August 2022

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#### **VISION**

**Transforming** young minds into motivated, quality aware and Environment conscious technocrats.

#### **Message from Head of the Department**

I warmly welcome you to the tenth edition of the annual newsletter - LUMINO - of the Department of Mechanical Engineering. Here you will find the latest news about the department, its exceptional achievements and updates of students and faculty. The UG programme in the department of Me- Dr. Jacob T Varghese chanical Engineering is certified with NBA Ac-



Professor and Head Department of Mechanical Engineering

creditation status for two year term with effect from 01 July 2016. This was made possible be-

cause of the wholehearted and sincere effort taken by the faculty members of the department. My hearty congratulations and gratitude to all the faculty members for this coveted achievement.

Our strategy for ensuring that our department remains well positioned to maintain its phenomenal growth includes attracting highly competent scholars as faculty members, expanding our honors tracks, and continuing to review and redefine knowledge transfer process, with an eye toward elevating the department to highly regarded position in the state level. I thank the current students and teachers for bringing their talents and fervor to continue the tradition of striving for their personal best as exemplified by their predecessors.

#### **EDITORIAL TEAM**



Er. Reuben Thomas



Er. Vimal O Kumar

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**MISSION:** Educating the students to excel professionally by:

- Providing facilities and environment conducive to a high quality education
- Cultivating the spirit of entrepreneurship, applied research and responding effectively to the needs of the industry.

• Emphasizing the values of leadership, contributing to economic development, protecting the environment and improving the quality of human life.

# Program Educational Objectives (PEOs) are 'Board Statements that describe what graduates are expected to attain within a few years of

graduation'

## Undergraduate Programme – B.Tech in Mechanical Engineering Programme Educational Objectives (PEOs)

After 3 to 5 years of completion of the graduation, our graduates will be able to:

PEO- 1 Enhance Professional Capability – They will apply mathematical, scientific and engineering principles for analyzing and solving mechanical engineering problems.

PEO— 2 Excel technically and foster continued learning — They will be competent to design and develop meaningful solutions for efficient utilization of man, machine, money and materials, using modern techniques and tools and nurture continuous learning.

PEO— 3 Address Social, Ethical and Environmental Concerns — They will prioritize social, ethical and environmental concerns in technological advancements.

PEO— 4 Enrich Essential Management Skills — They will augment management skills along with teamwork and effective communication for successful completion of engineering projects.

#### **Programme Outcomes (POs)**

- PO1 Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- PO2 Problem Analysis: Identify, formulate, review research literature, and analyse complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.
- PO3 Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- PO4 Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
- PO5 Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.

PO6 - The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

- PO7 Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
- PO8 Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- PO9 Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
- PO10 Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
- PO11 Project Management and Finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
- PO12 Life-long Learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.

#### **PSO Programme Specific Outcomes**

- PSO-1: Utilize their knowledge in Mechanical engineering on an applied basis.
- PSO-2: Apply the learned principles to the analysis, design, development and implementation of more advanced mechanical systems or processes involving modern engineering tools.
- PSO-3: Engage in lifelong learning and communicate technical ideas in a multidisciplinary environment, with an emphasis on risk and finance management.

#### Postgraduate Programme — M.Tech in Machine Design

#### **Programme Educational Objectives (PEOs)**

- After 2 years of completion of the graduation, our graduates will be able to:
- PEO 1 Design and develop machines and machine components in industry specific standards.
- PEO 2 Attain knowledge on modern engineering tools/software to address real world problems with social responsibility.
- PEO 3 Build a successful career by pursuing doctoral research degree to work in colleges, universities as professors or as scientists in research organizations.

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#### **Programme Outcomes (POs)**

Engineering programmes have been designed to prepare graduates for attaining the following program outcomes:

- PO 1 An ability to independently carry out research/investigation and development work to solve practical problems.
- PO 2 An ability to write and present a substantial technical report/ document.
- PO 3 An ability to demonstrate a degree of mastery over the area as per the specialization of Machine Design, including usage of modern engineering tools.
- PO 4 Design and analyze mechanical components and systems with realistic constraints.
- PO 5 Produce quality research outputs in multidisciplinary fields, leading to publications in patents, journals, and conferences.
- PO 6 Effectively utilize modern engineering tools and techniques that provide sustainable solutions to design-related problems faced by society.

#### **FDPs/Workshops/Training Programms**

- Dr. Ajith Kuriakose Mani, Er. Aju Jo Sankarathil, Er. Anil Kumar G, Dr. Rittin Abraham Kurien, Er.
   Sailesh K S, Er. Jenny John Mattam attended five-day FDP on Next Generation Adaptive Manufacturing System July 2021
- Er. Aju Jo Sankarathil attended FDP on Composite Materials and Mechanics July 2021
- Dr. Jiju V Elias attended Online Workshop on 3D Printing Solutions for Medical Innovation (3DPSMI 2021)
  – July 2021Er.
- Er. Liju Mathew Alexander Participated Industry 4.0 &
   The Digital Supply Chain July 2021
- Er. Philip Jacob Perakathu attended Faculty Development Program on Supply Chain Modelling and Logistics Management – July 2021
- Er. Bibin Varkey attended Online FDP on The Art Gallery of Engineering Graphics August 2021
- Er. Sailesh K S attended Nanoscience and Nanotechnology: Current Perspectives in Nanomaterials Synthesis and Characterizations November 2021
- ◆ Er. Aju Jo Sankarathil and Dr. Rittin Abraham Kurien attended Tribo India 2021 – December 2021



International conference of TRIBOINDIA 2021

– talk delivered by Satish C Sharma



International conference of TRIBOINDIA 2021

– talk delivered by Nicholas Spencer

- Er. Aneesh T attended FDP on Grant and funding project proposal writing December 2021
- Er. Anil Kumar G, Dr. Ajith Kuriakose Mani, Er. Aju Zachariah Mani, Er. Aneesh T, Dr. Rittin Abraham Kurien, Er. Arjun Venugopal, Er. Tobin Thomas, Er. Sailesh K S, Er. Liju Mathew Alexander, Er. Basil George Thomas participated three day workshop on Nanofluids Theory, Experimentation, Computation and Applications—September 2021
- **Dr. Jacob T Varghese, Er. Arjun Venugopal, Er. Basil George Thomas** participated in 26th National 4th International ISHMT ASTFE Heat and Mass Transfer Conference IHMTC 2021 December 2021
- ◆ Dr. Rittin Abraham Kurien participated 2nd Virtual International Tribology Research Symposium (ITRS 2021) – December 2021



International conference of TRIBOINDIA 2021 – talk delivered by Prasant Sahoo



International conference of TRIBOINDIA 2021 – talk delivered by Gregor Patzer

- ◆ Er. Sailesh K S attended 32nd Annual State Faculty Convention of ISTE Kerala Section February 2022
- ◆ Er. Jerin George attended NPTEL-AICTE FDP on Inspection and Quality Control February 2022
- Er. Sailesh K S attended Voice of Customer Training February 2022



FDP ON NANOFLUIDS- Inaugurated by Prof Dr K V Sharma



AICTE STTP Series 4 of 4 - Surface Characterization and Treatments in Tribology

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#### FDP/Workshop/Training Programs (Cont.)

- ◆ Er. Bibin Varkey attended Annual state faculty convention of ISTE February 2022
- ◆ Er. Sailesh K S attended Voice of Customer Training February 2022
- ◆ Er. Sailesh K S attended Faculty Entrepreneurship & Educational Technology for the Knowledge Economy February 2022
- ◆ **Dr. Rittin Abraham Kurien** participated 4th International Conference on Advances in Mechanical Engineering (Icame 2022) March 2022
- Er. Jenny John Mattam attended 3D Printing & Additive Manufacturing April 2022
- Er. Jithin K Kuriakose, Er. Jerin George, Er. Reuben Thomas, Er. Tobin Thomas, Er. Vimal O Kumar attended one day FDP on Introduction to Fusion 360 May 2022
- Er. Tobin Thomas, Er. Sailesh K S Participated 14th Summer School in Tribology June 2022
- ◆ Er. Bibin Varkey attended Recent Advances in Materials, Manufacturing, Thermal Science July 2022



Summer School in Tribology – June 2022



FDP Introduction to Fusion 360 – May 2022

#### **Faculty Publications**

- ◆ Er. Anil Kumar G published a paper on "Preliminary Experimental Investigations on an ultra-low head Hydro turbine energized by Gravitational Water Vortex Flow" International Conference on Energy and Environment- ICEE 2021
- Dr. Rittin Abraham Kurien published a paper on "Tribological and Mechanical Performance Characteristics of Epoxy-Resin Composites Reinforced with Multi-Walled Carbon Nanotubes for Sustainable Applications" Journal of Green Engineering 10 (2020): 8859-8873
- Dr. Rittin Abraham Kurien published a paper on "Green composite materials for green technology in the automotive industry." IOP Conference Series: Materials Science and Engineering. Vol. 872. No. 1. IOP Publishing, 2020.
- Dr. Rittin Abraham Kurien published a paper on "Mechanical characterization and evaluation of NaOH treated chopped abaca fiber reinforced epoxy composites." Materials Science Forum. Vol. 1019. Trans Tech Publications Ltd, 2021.

Dr. Rittin Abraham Kurien published a paper on "Experimental investigation on tribological characteristics of NaOH treated chopped abaca fiber reinforced epoxy composites." Materials Science Forum. Vol. 1019. Trans Tech Publications Ltd, 2021.

- Dr. Rittin Abraham Kurien published a paper on "Worn surface morphological characterization of NaOH-treated chopped abaca fiber reinforced epoxy composites." Journal of Bio-and Tribo-Corrosion 7.1 (2021): 1-8.
- Dr. Rittin Abraham Kurien published a paper on "A Study on Recent Developments in Jute, Cotton, Coir, Silk and Abaca Fiber-reinforced Composites." International Conference on Advances in Materials Processing & Manufacturing Applications. Springer, Singapore, 2020.
- Dr. Rittin Abraham Kurien published a paper on "A Review on Recent Developments in Kenaf, Sisal, Pineapple, Bamboo and Banana Fiber-Reinforced Composites." International Conference on Advances in Materials Processing & Manufacturing Applications. Springer, Singapore, 2020
- Dr. Tijo D published a paper on "Deposition of TiC-Cu composite coating on AISI 304 stainless steel by EDC process using powder compact tool electrode" Indian Journal of Engineering & Materials Sciences Vol. 27, June 2020, pp. 623-630

#### **PhD Awarded**



**Dr. Rittin Abraham Kurien** awarded PhD from Karunya Institute of Technology and Sciences, Coimbatore, India.

Ph.D thesis title - Development of Epoxy Hybrid Nano Composites Comprising MWCNT and Natural Fiber for Commercial Applications.

#### **New Joinees**



**Mr. Jithin K Kuriakose** had joined as Assistant Professor on 4th April, 2022. He completed his B. Tech from TocH Institute of Science and Technology, Arakkunnam, Ernakulam and M. Tech in Machine Design from College of Engineering Trivandrum (CET).

**Mr. Reuben Thomas** had joined as Assistant Professor on 6th April, 2022. He completed his B. Tech from MCET, Desamangalam, Thrissur and M. Tech in Machine Design from Saintgits College of Engineering, Kottayam





**Mr. Vimal O Kumar** had joined as Assistant Professor on 4th April, 2022. He completed his B. Tech Aeronautical from Jawaharlal College of Engineering, Lakkidi, Palakkad, Kerala and M. Tech in Propulsion Engineering from College of Engineer-

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#### **Professional Body Activities**

### Society of Automotive Engineers India Saintgits Collegiate Club





#### (Faculty Coordinator : Er. Bibin Varkey)

- Conducted Auto Quiz & CAD modelling contest for our students as part of SAE Tier 1 competition in our college December 13-17, 2021
- Team Striderz Racing of Saintgits College of Engineering designed and manufactured an All-Terrain Vehicle and successfully completed the final competition of BAJA 2022 held at NATRAX Automotive test track Pithampur, Madhya Pradesh April 6-10, 2022
- Conducted an induction program for the students of our college on BAJA SAEINDIA June 17, 2022



Flag Off—Team Striderz Racing of Saintgits College of Engineering, Pathamuttom Kottayam

 Organized a webinar about SAE activities for the students of Muthoot Institute of Technology and Science June 24, 2022, Madhya Pradesh April 6-10, 2022



All-Terrain Vehicle for participation in the SAE India BAJA 2022



**Team Striderz** 

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#### Indian Institute of Welding (IIW) Saintgits College of Engineering Students Chapter under Kochi Division

#### (Faculty Coordinator : Dr. Tijo D)

The Indian Institute of Welding (IIW) Students Chapter of Saintgits started a DWE EKAM webinar series on "SCIENCE, TECHNOLOGY AND PRACTICE OF WELDING". The first webinar of the series is conducted on Saturday, June 19, 2021 from 3 PM to 4 PM IST. Speaker: Dr. KAMLESH KUMAR, Assistant Professor, Madanapalle Institute of Technology & Science, Andhra Pradesh Topic: Recent Advancements in TIG Welding Process 19 June 2021

- Vysakh Prasad and team from S7MEB (2018-2022 MEB) participated in the National Welding Meet 2021 conducted by IIW Tiruchi 07-10-2021 to 08-10-2021
- In National Welding Meet 2021conducted by IIW Tiruchi, Vysakh Prasad and team from S7MEB (2018-2022 MEB) presented a conference paper entitled 'Design and Fabrication of Automated TIG Welding Mechanism'.07-10-2021 to 08-10-2021
- Formed a student committee consisting a chairman, secretary and treasurer for the smooth conduct of acivities for the academic year 2022-23 09/07/2022

#### Institution of Engineers (India) Saintgits Chapter **Mechanical Division**

#### (Faculty Coordinator : Er. Varun Mathew Idicula)

- Seminar Competition Final Year Students Mechanical Division 22 January 2022
- Industrial Visit -KSEB Nallalam Diesel Power Plant- Calicut-IV Sem ME Student 22 July 2022

# Google

IIW INDIA

#### **Indian Society for Technical Education (ISTE)**

#### (Faculty Coordinator : Er. Sailesh K S)

- One-day hands-on Faculty Training Program on Autodesk Fusion 360 software on 24th May 2022.
- A career counselling session was conducted year final Mechanical for the engineering students in the field of OIL & GAS related job oriented diploma courses by TISAT Group Institutions on 25th May 2022.
- MECHPRIZE, a merit scholarship exam initiated by National Council for Technology and Training (NACTET), New Delhi hosted by Armstech Engineers Private Limited, on 18th April 2022



Career counselling session for the final year Mechanical engineering students

Industrial Visit - KSEB Nallalam Diesel Power

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#### **Professional Activities (Cont.)**

PMI Kerala Academic Forum of Saintgits College of Engineering

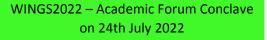




#### Philip Jacob Perakathu (Forum Convener)

- ◆ Induction Programme on 19th December, 2021 for new 194 members. Chief Guest: Shri. Jayakishore S R PMP, DASSM (President PMI Kerala Chapter)
- Expert talk on Project Management A Life Skill by Shri. Jayakishore S R, President, PMI Kerala Chapter for students of Saintgits Group of Institutions19 December
- Expert talk on Professional Networking: Purpose and Benefits by Shri. Harikuttan Kochukunju,
   VP Operations, PMI Kerala Chapter for students of Saintgits Group of Institutions 04 February
   2022
- Expert talk on Importance of Supply Chain Management and Introduction to Supply Chain Visibility by Shri. Aby Punnoose, Senior Consultant, Fourkites Inc., Chennai for students of Saintgits Group of Institutions 05 February 2022











Business Quiz v4.0 Competition on May-June, 2022

- ◆ Expert talk on My Story Motivational Session by Social Entrepreneur by Ms. Sobha Viswanath, Founder, Weavers Village / BHOOMIKA NGO, Thiruvananthapuram, Kerala for students of Saintgits Group of Institutions 08 March 2022
- ◆ Participated at PMRC 2022 Project Management Regional Conference on 21st May 2022 at Hotel O' by Thamara, Thiruvananthapuram 21 March 2022
- ◆ PMI Kerala Academic Forum of Saintgits College of Engineering conducted Group Discussion v2.0 competition for the students from Saintgits Group of Institutions during May-June 2022. It was conducted in two different stages
- PMI Kerala Academic Forum of Saintgits College of Engineering conducted Business Quiz v4.0 for the students from Saintgits Group of Institutions during May-June 2022. It was conducted in two different stage
- ◆ PMI Kerala Academic Forum of Saintgits College of Engineering conducted Aptitude Test for its student forum members for July 2022 Phase 1 on 30th June 2022

◆ PMI Kerala Academic Forum of Saintgits College of Engineering conducted Aptitude Test for its student forum members for July 2022 Phase 1 30th June 2022

- ♦ PMI Kerala Academic Forum of Saintgits College of Engineering conducted Aptitude Test for its student forum members for July 2022 Phase 2 18 July 2022
- Participated at Academic Forum Conclave, WINGS 2022 organized by PMI Kerala Chapter on 24th July 2022 at MITS, Cochin.
- PMI Kerala Chapter felicitated Er. Daniel Cherian, Past President, PMIK AF SCE, for passing PMP examination with flying colours.
- Ms. Bhavana Rajesh Pillai [2019-23 ECE] became the first student member to take PMI Global Student Membership. 24 July 2022
- PMI Kerala Academic Forum of Saintgits College of Engineering conducted Aptitude Test for its student forum members for August 2022 Phase 1 on 30 July 2022



Project Management Regional Conference on 21st May 2022

#### Faculty interaction with outside world

- ◆ Dr. Ajith Kuriakose Mani Reviewer/Editorial board Nonlinear Dynamics 10th July 2021
- ◆ Dr. Jacob T Varghese Expert member Professional Body, BoS, etc NITE Since 2018
- ♦ Er. Philip Jacob Perakathu AVP— Membership PMI Kerala Chapter 1st April 2021 to March 2022
- Dr. Rittin Abraham Kurien Fashion show Judge- National level cultural fest. Mar Baselios Institute of Technology and Science, Kothamangalam, Kerala 686693 18th May 2022
- ◆ Dr. Ajith Kuriakose Mani "Resource person (Invited Talk)" Second Virtual Ianternational Conference on Advanced Technologies and Research in Mechanical Engineering (VICATRME'22) on 24th May 2022
- Dr. Rittin Abraham Kurien Reviewer/Editorial board Transactions of the Indian Institute of Metals-Springer 27th May 2022
- Dr. Ajith Kuriakose Mani Resource person (Session chair) Second Virtual Ianternational Conference on Advanced Technologies and Research in Mechanical Engineering (VICATRME'22) on 24th May 2022
- Dr. Ajith Kuriakose Mani Reviewer/Editorial board Transactions of the Indian Institute of Metals-Springer, on 13th June 2022
- ◆ Er. Bibin Varkey Resource person Webinar With BAJA SAE team of Saintgits College of Engineering 24th June 2022
- Er. Manu Remanan Reviewer/Editorial board Transactions of the Indian Institute of Metals-Springer 30 th June 2022

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#### **Student Achievements**

#### 2018-2022 batch

Mr.Jenil John Mathai, Mr.Jerin C Chacko, Mr.Jerome George Varghese and Mr. Mathews Vivek Oommen secured First place in Southern Regional Technical Conclave held at Adhiyamaan College of Engineering

- Mr.Jenil John Mathai, Mr.Jerin C Chacko, Mr.Jerome George Varghese and Mr. Mathews Vivek Oommen secured Second place in MECH CRAFT 21 (All Kerala B.Tech Project Competetion) held at ALBERTIAN INSTITUTE OF SCIENCE AND TECHNOLOGY (AISAT) and IE(I)
- Mr.Jenil John Mathai, Mr.Jerin C Chacko , Mr.Jerome George Varghese and Mr. Mathews Vivek Oommen secured best project award in Multi Rotational Loader – Southern Regional
- Mr. Ashwin Santhosh, Mr. Daniel Paul, Mr Gowrisankar Kurup, Ms. Greshma Susan Reji published journal titled as A Review on Recent Developments in Kenaf, Sisal, Pineapple, Bamboo and Banana Fiber-Reinforced Composites in Lecture notes in Mechanical Engineering, Springer
- Mr. Ashwin Santhosh, Mr. Daniel Paul, Mr Gowrisankar Kurup, Ms. Greshma Susan Reji published journal titled as A Study on Recent Developments in Jute, Cotton, Coir, Silk and Abaca Fiber-reinforced Composites in Lecture notes in Mechanical Engineering, Springer

#### **Stream Coordinators**

**Design Stream** 



Er. Sailesh K S

**Production Stream** 



Er. Arun K Varghese

**Thermal Stream** 



**Er. Basil George Thomas** 



2020-2022 M.Tech Machine Design



2018-2022 B.Tech Mechanical Engineering - A Batch



2018-2022 B.Tech Mechanical Engineering - B Batch



**Department of Mechanical Engineering** 

#### Editorial Board

Dr. Jacob T Varghese Head of the Department

#### Editor and Designer

Er. Reuben Thomas Er. Vimal O Kumar Assistant Professors

#### Special Thanks

Er. Tobin Thomas
Assistant Professor

#### Printed and published by

Dr. Jacob T Varghese

Department of Mechanical Engineering Saintgits College of Engineering, Kottukaulam Hills, Pathamuttom, Kottayam—686532, Kerala

#### The Department at a glance

The department of mechanical Engineering at Saintgits College of Engineering was established in the year 2002 with an intake of 66 students. The four year B.Tech course consists of Eight semesters integrated with theoretical and Practical sessions. Currently the yearly intake is 126 students and they are allocated in 2 batches viz. ME(A) & ME(B). M.tech in Machine Design was started in 2008 with an yearly intake of 18 students. Add— on courses on Modelling and Ansys Software, MS Projects, CNC and 3-D Printing are being conducted for the UG students.

https://saintgits.org/saintgits-college-of-engineering/b-tech-mechanical-engineering/





Mr. Ashwin



Mr. Leon Vincent



Mr. Reghunand M Anil



Mr. Vysakh Prasad

Placed in Mahindra & Mahindra Ltd



