NADAR SARASWATHI COLLEGE OF ENGINEERING AND TECHNOLOGY

VADAPUDUPATTI, THENI - 625531

DEPARTMENT OF MECHANICAL ENGINEERING

CENTRE FOR RESEARCH – FACILITIES AVAILED

OBJECTIVE

- ✓ To undertake scientific research by providing research facilities to carry out basic and applied research.
- ✓ To develop, improve and share the scientific knowledge as well as technical facilities.
- ✓ To conduct conferences, seminars, demonstrations and exhibitions relating to the research done, knowledge generated through publishing and promoting the obtained results.
- ✓ To establish research laboratories and experimental tests for scientific research.

ABOUT THE DEPARTMENT

DEPARTMENT OF MECHANICAL ENGINEERING

The **Department of Mechanical Engineering** was established in the academic year 2010-2011, M.E. (Manufacturing Engineering) from the academic year 2014-2015. The department plays a leading role in evolving an "Engineering Science" based curriculum. The faculty members are highly qualified and specialized in the fields of thermal engineering, industrial engineering, material science, design and manufacturing. The mechanical engineering students learn to tackle challenges and solve real problems through their individual knowledge.

The department became an approved research center of Anna University in the year 2016. The department has highly qualified and experienced faculty members. The faculty members actively engage in research and constantly publish papers in International and National Journals.

The department regularly organizes technical workshops for the students to expose them to emerging areas. The department has the state of the art facilities for various laboratories, classrooms to support e-learning and department library. The department has a well equipped centralized workshop facility which caters to the needs of various departments. Guest lectures and industrial visits are periodically arranged for the students to supplement their curriculum.

Well equipped SMART CLASS room provides highly interactive learning sessions. These classes promote frequent, direct interaction between professors and students, greatly enhancing the learning process. Laboratory courses in several mechanical engineering areas provide intensive experience in experiment/data design, measurement and analysis. Students receive design experience through hands on experience in our CAD/CAM lab.

DEPARTMENT OBJECTIVES

The department of Mechanical Engineering aims to produce the engineer's with the abilities:

- To design and conduct experiments, as well as to analyze and interpret data.
- To design a system, component to meet desired needs.
- To function on multi-disciplinary teams.
- To identify, formulates, and solves engineering problems.
- Understanding of professional and ethical responsibility.
- To use the technique, skills, and modern engineering tools which are necessary for engineering practice, recognition of the need for, and an ability to engage in lifelong learning.

UG: Started with 60 seats in 2010 and Intake Increased to 120 in 2014

PG: Started with 18 seats in 2014

VISION & MISSION OF THE DEPARTMENT

VISION

To impart standard technical education, To produce competitive and smart engineers, To inculcate high sense of discipline combined with education to make the students as persons with right combination of academic excellence and personality, To develop the infrastructure, enhance the quality and content of the technical education by starting multifarious disciplines, To raise this technical institution.

MISSION

To provide opportunities for the development of knowledge, soft skills and professional abilities to the faculty members and students. To provide the youth with the best opportunities and academic ambience through the state of the programs at graduate and postgraduate level and to enable them to attain high levels of academic excellence as well as scientific, technical and professional competency.

DEPARTMENT OF MECHANICAL ENGINEERING

Sl. No.	Name of the Staff Members	Designation
1	Dr. C.Mathalai Sundaram, M.E., M.B.A., (Ph.D.),	**Principal**
2	Dr. J.Bensam Raj, M.E., Ph.D.,	**Professor**
3	Mr. V.Sivaganesan, M.E., M.I.S.T.E.,	Assistant Professor
4	Mr. A.VembathuRajesh, M.E., M.I.S.T.E.,	Assistant Professor
5	Mr. V.Thirumalairaj, M.E., M.I.S.T.E.,	Assistant Professor
6	Mr. R.Radhakrishnan, M.E., M.I.S.T.E.,	Assistant Professor
7	Mr. R.Santhaseelan, M.E., M.I.S.T.E.,	Assistant Professor
8	Mr. R.Nagaraja, M.E., M.I.S.T.E.,	Assistant Professor
9	Mr. B.Nagarajan, M.E., M.I.S.T.E.,	Assistant Professor
10	Mr. P.Surulimani, M.E., M.I.S.T.E.,	Assistant Professor
11	Mr. A.Karthikraja, M.E., M.I.S.T.E.,	Assistant Professor
12	Mr. T.Sudharsanan, M.E., M.I.S.T.E.,	Assistant Professor
13	Mr. M.Pradeep, M.E., M.I.S.T.E.,	Assistant Professor
14	Mr. S.Hari Kishore, M.E., M.I.S.T.E.,	Assistant Professor

15	Mr. J.Chakravarthy Samy Durai, M.E., M.I.S.T.E.,	Assistant Professor
16	Mr. M.Chellapandian, M.E., M.I.S.T.E.,	Assistant Professor
17	Mr. A.Vennimalai Rajan, M.E., M.I.S.T.E.,	Assistant Professor

Research & Project Laboratory

This lab contains the following:

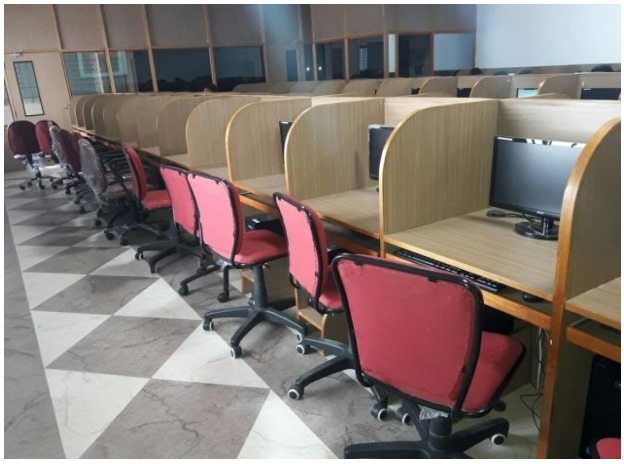
ACER Veriton M200 NIT Series

Intel Core i3 – 4170 (4th Gen) Processor

Itel H81 Chipset Mother Board

4 GB RAM, 1 TB @ 7200 RPM SATA HDD

CNC – CAM LAB



No. of Journals Published - Students

No. of Journals Published

PG Students - 3 Nos

UG Students - 11 Nos

Total - 14 Nos

List of Journals (Hard Copy)

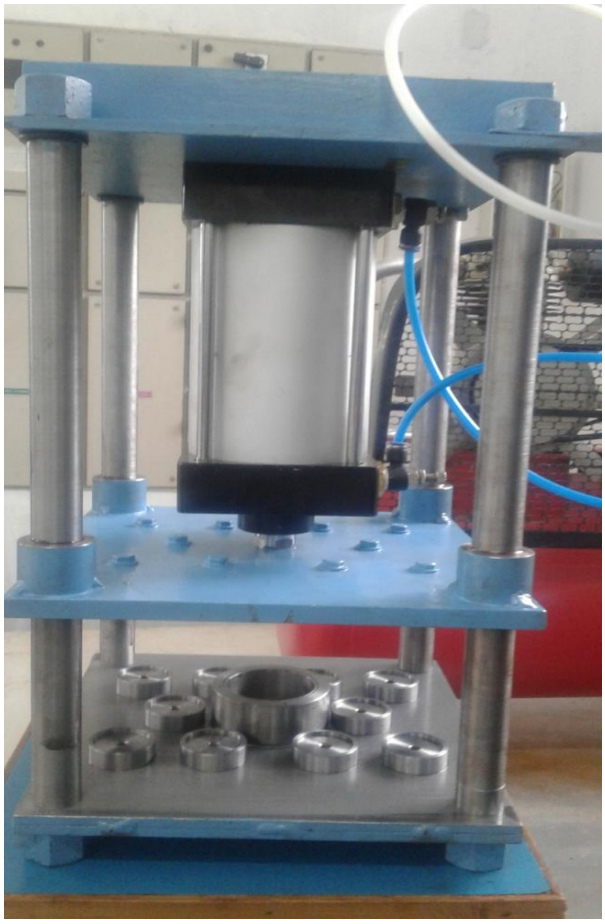
NATIONAL JOURNALS
Metallurgical Materials and Mining Engineering
Indian Journal of Engineering and Material science
Journal of Scientific & Industrial Research
Inventi impact : Aerospace Engineering
Inventi impact :Modeling simulation
Inventi impact : Auto
INTERNATIONAL JOURNALS
International Journal of Advances in Mechanical Engineering
International Journal of Mechanical &Material science
International Journal of Production and Quality Engineering
International Journal of Advanced in Thermal Sciences and Engineering
International Journal of Product Design
International Journal of Manufacturing Sciences and Engineering
Internal Journal of Modern Manufacturing Technology (M.E.)

List of Journal (Soft Copy)

DELNET (Developing Library Network)

R&D Projects (funded/sponsored research)

Automation in Portable Oil Seal Assembly Machine



ABSTRACT

The rotary shaft seal is used for excluding dirt, dust, water of other particles, while retaining lubricant in rotary shaft equipment. It was developed as a means of protecting bearings of rotating shafts. The area between the sealing edge and the shaft is most important. The sealing effect is achieved by preloading the sealing lip making its internal diameter slightly smaller than the shaft diameter. The garter spring ensures constant force to shaft, flattening the sealing edge to a defined width. Oil seals prevent internal system fluids from leaking and keep external contamination from entering the system. Leakage and contaminants paths occur between the shaft and seal lip and between the seal and the housing. Oil seals need to seal both dynamically and statically.

An oil seal normally consists of three basic components are rubber sealing element, the metal insert and garter spring. The purpose of the sealing element is to stop the fluid from leaking between the shaft and housing. The metal insert will give rigidity and strength to the seal while it is being bore or recessed groove. The garter spring will help make the rubber sealing element more effective.

The oil seal assembly machines are used for assembling the oil seals and varieties of oil seal assembly machines are available in market such as electrically operated and hydraulic operated etc. The limitations of the oil seal assemble machines are biggest size, high cost and maintenance is difficult. In this portable oil seal assembly machine has compact in size, maintenance is easy, pneumatically operated and low cost.

PATENT FOLLOW UPS

Sl. No.	Date	Progress
1	01.07.16	Submission of Invention Disclosure Form
2	29.07.16	Submission of Remarks for Patent Search of our invention titled “Automation in Portable Oil Seal Assembly Machine”
3	14.09.16	Payment of Examination and Early Publication Fee for Patent Search of our invention titled “Automation in Portable Oil Seal Assembly Machine”
4	14.10.16	Payment of Examination and Early Publication Fee for Patent Search of our invention titled “Automation in Portable Oil Seal Assembly Machine”

Special Features:

1. Simultaneously can assemble 10 numbers of assembled oil seal
2. Increases the production rate
3. Reduces the human effort in oil seal fixing
4. Reduces the time consumption of fixing the oil seals
5. Fixes the work piece correctly in position
6. Used in mass production

LIST OF EQUIPMENTS AVAILABLE IN THE LABORATORIES RELATED TO RESEARCH.

GEAR HOBBING MACHINE

For Manufacturing of

- Helical gears
- Involute gears
- Ratchets
- Splines
- Sprockets
- Spur gears
- Worm gears

PROFILE PROJECTOR

For the Inspection

- Measure in 2D Space
- Can Reveal Imperfections
  - Burrs
  - Scratches
  - Indentations
  - Undesirable Chamfers

SURFACE ROUGHNESS TESTER

For Indicating and Recording

- Measure Roughness in microns
- Availability of Electrical Signal to obtain any desired roughness parameter or can be recorded for display or subsequent analysis.

CNC LATHE

- Ability to make intricate cuts on different types of material.
- Materials like wood, plastic, and metal using FANUC Operating system
- Operations
  - Facing
  - Turning
  - Grooving
  - Circular Interpolation
  - Boring operation

CNC MILLING

- For drilling and Cutting using a rotating cylindrical cutting tool using FANUC Operating system.
- Operations
  - Drilling
  - Pocketing
  - Face milling
  - End milling
  - Engraving
  - Letter cutting

UNIVERSAL TESTING MACHINE

- For Mechanical Properties of Materials
- Materials like Metals, Polymers and Ceramics.
- Can Perform
  - Compressive test
  - Tensile test

UNIVERSAL MILLING MACHINE

- For the Removal of Metal with various attachments.

- Operations
  - Boring
  - Slotting
  - Circular milling dividing
  - Drilling

RADIAL DRILLING MACHINE

- For geared drill head designed for universal movements of the arm with a tool head over a stationary work piece.
- Operations
  - Reaming
  - Boring
  - Tapping
  - Counter sinking
  - Counter boring
  - Spot facing

TOOL AND CUTTER GRINDER

- For sharpening milling cutters and tool bits along with a host of other cutting tools.
- To perform a variety of grinding operations like surface, cylindrical, or complex shapes

TORQUE MEASUREMENT

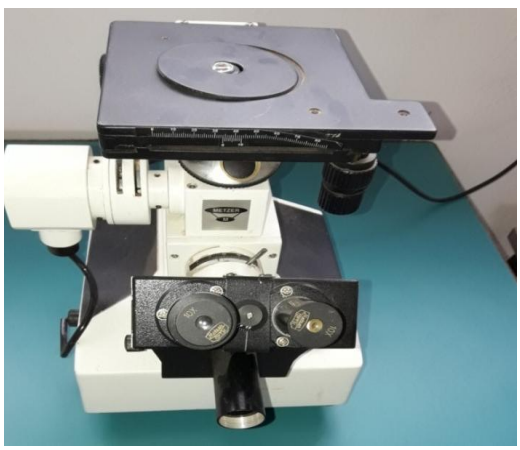
- Applications of torque transducers and offers a reference for resolution of issues impacting applications.
- Measurement from Torque transducers
  - Installation
  - Startup
  - Vibration analysis
  - Calibration,
  - Metrological principles

TOOL MAKERS MICROSCOPE

- Designed for measurements of parts of complex forms like profile of external threads, tools, templates and gauges.
- Measuring center-to-center distance of holes in any planes, as well as the coordinate of the outline of a complex template gauge.
- Operations
  - Determination of the Relative Positions
  - Measurement of Angles
  - Comparison Measurement
  - Comparisons of thread forms,
  - Measurement of pitch and effective diameter

M Inverted Trinocular Metallurgical Microscope Vision Plus

- For visualization or Observing by four to six objective lenses of different magnifications.
- Fitted with accessories for fitting still and video cameras, fluorescence illumination, confocal scanning.
- Observation method
  - Bright field
  - Simple Polarizer (option)



M Coaxial Trinocular Research Metallurgical Microscope Vision Plus

- For metallurgical inspection including metals, ceramics and other materials
- Producing a magnified image of a small object and coaxial handle allows easy position adjustment of samples.

HYDRAULIC PRESS

- To generate a compressive force using a hydraulic cylinder with required attachments.
- Operations
  - Forging
  - Moulding
  - Blanking
  - Punching
  - Deep Drawing
  - Water Hammer Setup

CENTRELESS GRINDING MACHINE

- Machining process happens by abrasive cutting to remove material from a work piece.
- Used in preference to other grinding processes for operations where many parts must be processed in a short time for irregular job.

L

Sl. No.	Name of the Software's
1.	ANSYS
2.	AUTO CAD
3.	Pro-E
4.	HYDRO SIM
5.	PNEUMO SIM
6.	VERSA PRO
7.	LABVIEW

Innovative Projects done by our Students

1. Foldable Mini Bike
2. Robo
3. Borewell Rescue System
4. Automatic Side Stand Retrieval System
5. Four Wheel Steering System

தினமலர்

மதுரை ■ வெள்ளி ■ மார்ச்

'புராஜெக்ட் எக்ஸ்போ' வில் அசத்திய இன்ஜினியரிங் மாணவர்கள்

தேனி, மார்ச் 25-

தேனியில் இன்ஜினியரிங் கல்லூரியில் நடந்த 'புராஜெக்ட் எக்ஸ்போ' வில் தாங்கள் கண்டுபிடித்த புதிய கருவிகள் அறிமுகம் செய்து மாணவர்கள் அசத்தினர்.

இன்ஜினியரிங் மாணவர்களின் புதிய சிந்தனைகளும், கண்டுபிடிப்புகளும் சமூகத்திற்கும், வாழ்க்கைக்கும் பயன்பட வேண்டும் என்ற நோக்கில் தேனி நாடார் சரஸ்வதி இன்ஜினியரிங் கல்லூரியில் 'புராஜெக்ட் எக்ஸ்போ-2016' நடத்தப்பட்டது. இதில் தாங்கள் கண்டு பிடித்த புதிய கருவிகளை மாணவர்கள் பார்வைக்கு வைத்தனர்.

தானியங்கி ஸ்டாண்ட்: இருசக்கர வாகனங்களை நிறுத்த 'சைடு ஸ்டாண்ட்' பயன்படுத்துகிறோம். பல சமயம் இதனை மறந்து வாகனம் ஓட்டி செல்லும் போது விபத்தில் சிக்குகிறோம். இதுபோன்ற மறதியாளர்களை பாதுகாக்க ஒலி எச்சரிக்கை செய்வது நடைமுறை உள்ளது. இதற்கு அதிக பேட்டரி மின்சாரம் வீணாகும், ஒலி சில சமயம் எரிச்சலாகும். இதற்கு மாற்றாக 'டூவீலர்' ஸ்டார்ட் ஆகி, முதல் கியர்அப்பே செய்த வுடன் 'சைடு ஸ்டாண்ட்' தானாகவே ரிலீஸ் ஆகிவிடும்.

ஆழ்துளை குழிகளில் குழந்தைகள் விழுந்து பலியாகின்றன. இவர்களை மீட்க 'போர்வெல் ரெக்கவரி ரோபோட்' கருவி வடிவமைத்துள்ளனர். கைகள் போன்ற 3 இளாம்கனும், 4வது இளாம்பில் கேமரா பொருத்தப்பட்டிருக்கும். கியர் சிஸ்டத்தில் தேவைக்கு ஏற்ப இயந்திரத்தை திருப்பி குழந்தையின் நிலையை அறிந்து குழியில் மீட்கலாம்.

ஸ்மார்ட் போல்டிங் பைக்: வெளியூர் செல்வோர் டூவீலரை மடக்கி தூக்கி செல்லும் வகையில் 'போல்டிங் பைக்' உருவாக்கி உள்ளனர். முன்சக்கரம், பின் சக்கரத்தையும் மடக்கி வைத்து கொள்ளும் வகையில் 20 கிலோ எடையில் டூவீலர் உருவாக்கப்பட்டுள்ளது. இந்த எளிய வகை டூவீலர் வடிவமைக்க அதிகபட்சம் ரூ.5 ஆயிரம் ஆகும் என்கின்றனர்.

நொடியில் வருகை பதிவு: கல்வி நிறுவன வகுப்பறையில் எத்தனை மாணவர்கள் இருந்தாலும் 'கேமரா' மூலம் வருகையை பதிவு செய்யும் 'ஆட்டோமெடிக் அட்டெனன்ஸ் மேனேஜ்மெண்ட் சிஸ்டம்' எனும் கருவியினை கண்டுபிடித்துள்ளனர். இதில் சம்பந்தப்பட்ட நபரிகளின் உருவம், நேரத்தை 'செட்' செய்தால் தானாகவே அனைவரையும் கேமராவில் பதிவு செய்து, 10 நொடியில் வருகை பதிவு செய்து விடும்.

ஸ்பீடு பிரேக்கரில் மின் உற்பத்தி: ரோடுகளில் உள்ள ஸ்பீடு பிரேக்கர் (வேகத்தடை) மீது வாகனம் ஏறி சென்றாலே அதன் அழுத்தத்தால் இயந்திர சக்தி, மின்சக்தியாக மாற்றி மின்சாரம் பேட்டரியில் சேமிக்கப்பட்டு மின்சாரம் கிடைக்கும்.

புரோகிராம் சென்சார் சிஸ்டம்: விபத்தை தவிர்க்க வாகனங்களிடையே 10 மீ.இடைவெளி விட்டு வர வலியுறுத்துகின்றனர். இவ்விதியை 'பலர் கடைபிடிப்பது இல்லை. மாணவிகள் கண்டுபிடித்த 'எக்கோ சென்சார்' கருவி பொறுத்தினால் 10 மீ. இடைவெளியில் கார் நெருங்கினாலே வாகன வேகம் குறைந்து விடும். மது போதையில் கார் ஓட்டினால் ஜி.பி.ஆர்.எஸ்., மூலம் ஆர்.டி.ஒ.,விற்கு எஸ்.எம்.எஸ்., செல்லும் வகையில் வடிவமைத்துள்ளனர்.

கண்காட்சிக்கு உறவின்முறை பொது செயலாளர் ராஜமோகன் தலைமை வகித்தார்.

கல்லூரி செயலாளர் ராமச்சந்திரன், முதல்வர் சத்திய மூர்த்தி, துணை முதல்வர் மதளைசுந்தரம், விடுதி செயலர் கண்ணாயிரம் கலந்து கொண்டனர். மாணவர்கள் பார்வையிட்டனர்.

மாணவர்கள் வடிவமைத்த 'ஸ்மார்ட் போல்டிங் பைக்'

'போர்வெல் ரெக்கவரி ரோபோட்'

DEPARTMENT LABORATORIES

1. **Engineering Practices Laboratory**
   - Plumbing
   - Welding
   - Carpentry
   - Sheet Metal
   - Smithy
   - Foundry

2. **Manufacturing Technology Laboratory**
   - Lathe Operations
   - Taper Turning/External Thread cutting/Internal Thread Cutting/Eccentric Turning/Knurling
   - Milling Operations
   - Shaping Operations
   - Slotting Operations
   - Grinding-Cylindrical and Surface Grinding Operations
   - Center-less Grinding Operations
   - Gear Hobbing Operations
   - Drilling Operations

3. **Thermal Engineering Laboratory**
   - Performance Test on Petrol and Diesel Engines-Mechanical/Electrical/Hydraulic Load
   - Heat Balance Test
   - Retardation Test
   - Morse Test
   - Flash and Fire Point of fuels
   - Viscosity Measurement
   - Thermal Conductivity Measurement
   - Emissivity Measurement
   - Effectiveness of Heat Exchanger
   - Performance Test on Refrigeration and Air Conditioning System

4. Metrology & Measurements Laboratory

- Surface Roughness Measurement
- Torque/Temperature/Force Measurement
- Measurement of Gear Tooth Parameters
- Measurement of Thread Parameters
- Measurement of Flatness
- Molecular Structure Observation
- Calibration of Measuring Instruments

5. Dynamics Laboratory

- Study of gears and gear trains
- Kinematics Mechanisms
- Determination of Mass Moment of Inertia
- Balancing of Rotating Masses-Static and Dynamic
- Cam Parameters
- Study of gyroscopic effect and couple
- Degrees of Freedom
- Governor Apparatus
- Torque/Vibration/Force Measurement

6. CAD/CAM Laboratory

- 2D and 3D Auto CAD Drawings
- Pro-E Modeling
- Simulation of Machine Components
- Analysis of Load Parameters
- CNC – Lathe and Milling Operations

7. Mechatronics Laboratory

- Transducers
- PLC (Programmable Logic Controller)
- Pneumatic Automation
- Hydraulic, Pneumatic and Electro-Pneumatic circuits.
- Modelling and analysis of basic hydraulic, pneumatic and electrical circuits using Software.

8. **Automation and Metal Forming Laboratory**
    - Hydraulic Press
    - Mini Rolling Mill
    - CNC – Lathe and Milling Operations
    - Universal Testing Machine (UTM)
    - Capstan and Turret Lathe Operations

OUR PRODUCTS:(NADAR SARASWATHI INCUBATION CENTRE)

- Static Robot
- Barrycard
- Bench & Desk
- Gate
- Grill fabrication
- Name board

Events Organized/Conducted

1. ***National level Technical Symposium "TRENCHANTZ-2K14" held in 12th September 2014.***

   Chief Guest

   Dr. K. Lingadurai, M.E., Ph.D.,
   Professor & Head,
   Anna University, Dindugal.

   Dr. V.Raja, M.E., Ph.D.,
   Assistant Professor,
   Anna University, Dindugal.

2. ***Guest lecture on "Engineering Mechanics" held on 24th January 2015.***

   Resource Person

   Dr. K. Lingadurai, M.E., Ph.D.,
   Professor & Head,
   Anna University, Dindugal.

3. ***Guest lecture on "Job opportunities in Abroad" held on 29th January 2015.***

   Resource Person

   Mr. C. Manohar Chandran, M.E., M.S.,
   Product Design Engineer,
   FMC Technologies, Singapore.

4. ***National level workshop on "Traditional and non-traditional techniques in optimization" held on 31st January 2015.***

   Chief Guest

   Dr.N.Jawahar,
   Professor & Dean R & D,
   Thiagarajar College of Engineering,
   Madurai.

5. ***National level conference on "Innovations and Advances in Mechanical Engineering" held on 13th March 2015 and the papers are published in International Journal of Applied Engineering and Research (IJAER).***
   (Listed in Annexure – II of Anna University, Chennai)

   Chief Guest

   Dr. S.Soundarapandian,

   Professor,

   Indian Institute of Technology,

   Madras.

6. ***National level Technical Symposium "TRENCHANTZ-2K15" held in 9th September 2015.***
7. ***Guest lecture on "Fluid Mechanics &Machinery " held on 12th September 2015.***

8. ***National level workshop on "Advances in Composite Materials and Manufacturing" held on 12th February 2016.***

9. ***National level workshop on "Artificial Intelligence for Engineering Applications" held on 27th August 2016.***
10. ***National level Technical Symposium "TRENCHANTZ-2K16" held in 31st August 2016.***