



KUMARAGURU
COLLEGE OF TECHNOLOGY



Department of Mechanical Engineering

Newsletter

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DEPARTMENTAL ACTIVITIES

PROGRAMMES ORGANIZED

- Our department along with Textile Technology Department organized an AICTE sponsored 14 days FDP on 'Application of Industrial Engineering concepts in Apparel and Textile Industry to improve productivity and quality of apparels' between 16.11.2019 and 30.11.2019.



Dr. SR. Devadasan/PSG Tech, Coimbatore was the chief guest. Around 40 Participants gained knowledge in the application of Industrial Engineering in Apparels and Textile sectors.

Dr. M. Balaji, ASP/ME and Mr. R. S. Mohan Kumar, AP/ME coordinated the event on behalf of our department.

- A Demonstration on Gas Chromatography was organized for Biotechnology students (UG and PG) on 21.11.2019. Demo was given by Mr. B. Jeeva, AP/ME. The demo included the following



1. Biogas composition was measured by using Gas chromatography.
 2. Working on gas chromatography.
- An Industrial Training was arranged to our faculty members at M/s. Roots Polycraft on 23.11.2019. Mr. Mahendra Bharathi, HRD, Roots Polycraft, Coimbatore trained 17 faculty members of the department in various machines and also in the procedures followed in Store rooms, Quality Control.



Mr. R. S. Mohan Kumar, AP/ME coordinated the event.

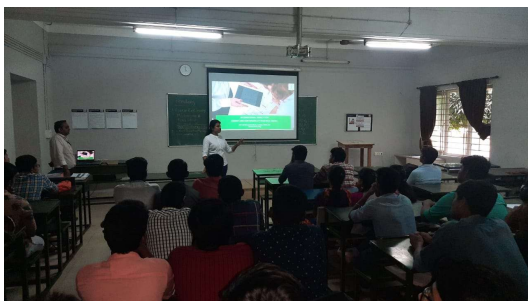
DEPARTMENTAL ACTIVITIES

- A One day Training on Personality development and Presentation skills was arranged in the department in association with Coimbatore Productivity Council on 23.11.2019. Mr. M. D. Nasser Kamal, Executive Trainer, CPC, Coimbatore" trained 19 participant in Personality development and also in developing self confidence.



Mr. M. A. Vinayagmoorthi, AP (II)/ME and Mr. R. S. Mohan Kumar, AP/ME coordinated the event.

- A Guest Lecture on "Awareness on Energy Management certification programme for students from International Society for Energy and sustainability Research (ISESR, UK)" was organized by the department on 31.10.2019. Ms. Krishna Rubigha, CEO, M/s. Ampere Voltage Consulting Private Limited, Coimbatore and CEO of International Society for Energy and Sustainability Research (India) delivered the lecture.



Mr. B. Jeeva, AP/ME coordinated the guest lecture.

A one day workshop was organized by the department to enhance the computer applications for Technical supporting staff on 26.11.2019. Mr. M. Thirumalaimuthukumaran, AP (II)/ME and Dr. V. R. Muruganantham coordinated the event.



PROPOSALS SUBMITTED

- Modernization of Thermal Engineering Laboratory was submitted to AICTE by Dr. C. Velmurugan, HoD/ME, Dr. R. Manivel, Professor/ME and Mr. B. Jeeva, AP/ME on 28.08.2019 for Rs. 1,809,810.59/-

PAPERS REVIEWED

Dr. P. S. Samuel Ratna Kumar, AP / ME reviewed a paper titled "Study on Corrosion Resistance of Al203 Reinforced Copper Matrix Composites" for the Materials Research Express Journal.

CONSULTANCY

- Surface roughness test to Mr. R. Tamizharasu and to Mr. P. Gunasekaran, M. E.-CAD, II - year, Government College of Engineering, Salem, Tamil Nadu. Dr. B. Senthilkumar, ASP/ME coordinated the consultancy work.

DEPARTMENTAL ACTIVITIES

PROGRAMMES PARTICIPATED

- Following faculty members from the department participated in TEQIP III Sponsored FDP on “Recent Trends in Industrial Metrology and calibration of Measuring Instruments” at PSG College of Technology between 03.11.2019 to 09.11.2019.



Dr. C. Velmurugan, HoD/ME
Dr. S. Balasubramanian, ASP/ME
Dr. S. Thirumuruga Veerakumar, AP (III)/ME
Mr. M. Thirumalai Muthukumar, AP (II)/ME
Mr. T. Karuppusamy, AP (II)/ME
Mr. M. A. Vinayagamoorthi, AP (II)/ME
Dr. A. P. Arun, AP (II)/ME
Mr. S. Subbiah, AP/ME

- Mr. B. N. Sreeharan, AP (II)/ME and Mr. K. Manikanda Prasath, AP/ME participated in the AICTE Training and Learning (ATAL) Academy sponsored Faculty Development Programme (FDP) on “3D Printing for Engineers” from 29.10.2019 to 02.11.2019 organized by the Department of Production Engineering, Government College of Technology, Coimbatore – 641 013.



- Following faculty members participated in a Faculty Development Programme conducted at National Institute of Technology – Surathkal on the topic “Internet of Things” between 04.11.2019 to 09.11.2019.

Dr. K. K. Arun, AP (III)/ME
Mr. V.R. Navaneeth, AP/ME
- Dr. S. Sivakumar, AP(III)/ME participated in a Workshop on “Writing Peer reviewed journal” conducted by NITTTR, Chennai between 25.11.2019 and 27.11.2019.



DEPARTMENTAL ACTIVITIES

- Following faculty members participated in an AICTE Sponsored Faculty Development Programme at PSG College of Technology on "Vibration Measurement, Analysis & Applications of Smart Materials in Vibration Control" from 11.11.2019 and 24.11.2019.



Dr. P. Sathyabalan, Professor/ME

Dr. N. Sangeetha, Sr. ASP/ME

- Mr. S. Prabhu, AP/ME, participated in an AICTE Sponsored Faculty Development Programme at our college on "Application of Industrial Engineering concepts in Apparel and Textile Industry to improve productivity and quality of apparels" from 16.11.2019 and 30.11.2019.

EXTERNAL INTERACTIONS

- Dr. K. Ulaganathan, AP (III)/ME and Dr. K. M. Senthilkumar, ASP/ME acted as SQUAD Member for Anna University Regional Center, Coimbatore on 14.11.2019.
- Dr. S. Balasubramanian, ASP/ME acted as Project Work Viva-Voce Examiner - UG at Faculty of Engineering, Karpagam Institute, Coimbatore on 01.11.2019.

- Dr. C. Velmurugan, HoD/ME and Dr. V. R. Muruganatham, ASP/ME involved in identification of Student and Faculty Industry Training sources and curriculum discussion on 14.11.2019 at M/s. Innovative Industries, Idigarai, Coimbatore.

- Dr. N. Sangeetha, Sr. ASP/ME acted as External Examiner for the End Semester Practical Examination - UG at Government College of Technology, Coimbatore on 04.11.2019 and 05.11.2019.

- Dr. A. P. Arun, AP (II)/ME was appointed for End Semester Examination Answer Script Audit at Karunya University, Coimbatore on 29.11.2019.

- Mr. P. Pradeep, AP/ME, Mr. P. D. Devan, AP/ME, Mr. K. Krishnamoorthi, AP (II)/ME and Mr. S. Rajesh, AP/ME were appointed as examiner for valuation of UG and PG End Semester Examinations held during November / December 2019 at Mepco Schlenk Engineering College, Sivakasi between 28.11.2019 - 30.11.2019.

- Mr. R. S. Mohan Kumar, AP/ME was appointed as End Semester Examination Answer Script Audit at Karunya University, Coimbatore on 28.11.2019.

DEPARTMENTAL ACTIVITIES

PAPERS PRESENTED



- Dr. P. S. Samuel Ratna Kumar, AP/ME, presented a paper entitled "Vibration – Impact study on AlMg4.5Mn reinforced Nanoclay Composites" in "2nd International Conference on Recent Advances in Materials & Manufacturing Technologies (IMMT 2017) conducted at BITS, Pilani (Dubai Campus) between 20.11.2019 and 22.11.2019. He also presented another paper titled "Impact of Cu-Al-Ni shape memory alloy in dynamic performance of redundant SCARA Robot" in the same conference.

GUEST LECTURES DELIVERED



- Dr. M. Balaji, ASP/ME delivered a guest lecture on "Industrial Engineering – Past, Current and Future Perspective" in the AICTE Sponsored Faculty Development Programme at our college on "Application of Industrial Engineering concepts in Apparel and Textile Industry to improve productivity and quality of apparels" from 16.11.2019 and 30.11.2019.



- Dr. S. Bhaskar, ASP/ME, delivered a series of informative Guest Lecture on "VAK Methodology, Life Long Learning" in the AICTE sponsored one week Short term training program (STTP) on "Innovative Andragogical and Effective Teaching Learning Methodologies for Millennium Generation Learners" at KPR Institute of Technology on 21.11.2019.



Student Articles

TEXTILE WASTE AS THERMAL INSULATION



Praveen B – 18BME092
2nd Year Mechanical - B

In the European Union (EU), around 5.8 million tons of textiles are discarded by the consumers per year. Only 1.5 million tons (25%) of these textiles are recycled by charities and industrial enterprises.

The remaining 4.3 million tons goes to landfill or to municipal waste incinerators. The waste resulting from the textile industry have been increasing. Adding to this type of waste, there is also the textile waste from the textile industry. This shows that there is an enormous source of secondary raw material that is not used, but can be re-injected into the market.

Thus, environmental concerns with. In Portugal, the main textile waste comes from wool, cotton and synthetic and artificial fibers, according to the Technical Guide of the Textile Sector. In 2009, 293,000 tons of textile wastes were produced, according to National Plan for Waste Management.

After visiting several textile factories laboring in the north part of Portugal, it was found that there is a substantial amount of waste resulting from this industry. Clothes, woven fabrics and threads are among the most common types of waste.

Composition, texture and size are some material properties which may vary sharply as far as textile waste is concerned. Cotton, wool, linen, silk and acrylic are some possible composition of a textile product.

On the other hand, the structure, the thickness and the arrangement of the threads are some parameters that contribute for the possible different textures that a textile fabric may have.

For instance, taking into account that a textile waste results from the clothing process, in which there is an optimization of the fabric piece preparation, waste with different size and shape will result from this process.

Therefore, the different properties of the materials may increase the difficulty of studying possible textile waste applications. Considering that a mixture of these materials is also very likely to occur then this complexity is even more evident.

In the building industry application context, the potential of using these two types of textile waste woven fabric waste (WFW) and woven fabric subwaste (WFS) as an alternative thermal insulation solution for external double walls is emphasized because of the following theory. Both materials are 100% acrylic.

The density of the WFW and the WFS products was specifically quantified in this research work and the respective approximate values are 440 kg/m^3 and 122.5 kg/m^3 , respectively.

Student Articles

HEAT SHIELD



Srivathsan – 18BME088
2nd Year Mechanical - B

A heat shield is designed to protect an object from overheating by dissipating, reflecting or simply absorbing heat. The term is most often used in reference to exhaust heat management and to systems for dissipation of heat due to friction.

Heat shields protect structures from extreme temperatures and thermal gradients by two primary mechanisms. Thermal insulation and radiative cooling, which respectively isolate the underlying structure from high external surface temperatures, while emitting heat outwards through thermal radiation.

To achieve good functionality the three attributes required of a heat shield are low thermal conductivity (high thermal resistance), high emissivity and good thermal stability (refractoriness). Porous ceramics with high emissivity coatings (HECs) are often employed to address these three characteristics, owing to the good thermal stability of ceramics, the thermal insulation of porous materials and the good radiative cooling effects offered by HECs.

Some aircraft at high speed, such as the Concorde and SR-71 Blackbird, must be designed considering similar, but lower, overheating to what occurs in spacecraft.

In the case of the Concorde the aluminum nose allowed to reach a maximum operating temperature of 127 °C (which is 180 °C higher than the ambient air outside which is below zero); the metallurgical consequences associated with the peak temperature were a significant factor in determining the maximum aircraft speed.

Recently new materials have been developed that could be superior to "RCC". The prototype SHARP is based on materials Ultra-high-temperature ceramics, such as zirconium diboride (ZrB₂) and hafnium diboride (HfB₂).

The thermal protection system based on these materials would allow reaching a speed of Mach number 7 at sea level, Mach 11 at 35000 meters and significant improvements for vehicles designed for hypersonic speed.

The materials used have thermal protection characteristics in a temperature range from 0 °C to + 2000 °C, with melting point at over 3500 °C. They are also structurally more resistant than RCC, so they do not require additional reinforcements, and are very efficient in re-irradiating the absorbed heat.

The European Commission funded a research project, C3HARME, under the NMP-19-2015 call of Framework Programmed for Research and Technological Development in 2016 (still ongoing) for the design, development, production and testing of a new class of ultra-refractory ceramic matrix composites reinforced with silicon carbide fibers and Carbon fibers suitable for applications in severe aerospace environments.



KUMARAGURU college of technology

COIMBATORE – 641 049

Department of Mechanical Engineering

INSTITUTE VISION:

The vision of the college is to become a technical university of International Standards through continuous improvement.

INSTITUTE MISSION:

Kumaraguru College of Technology (KCT) is committed to providing quality Education and Training in Engineering and Technology to prepare students for life and work equipping them to contribute to the technological, economic and social development of India. The College pursues excellence in providing training to develop a sense of professional responsibility, social and cultural awareness and set students on the path to leadership.

DEPARTMENT VISION:

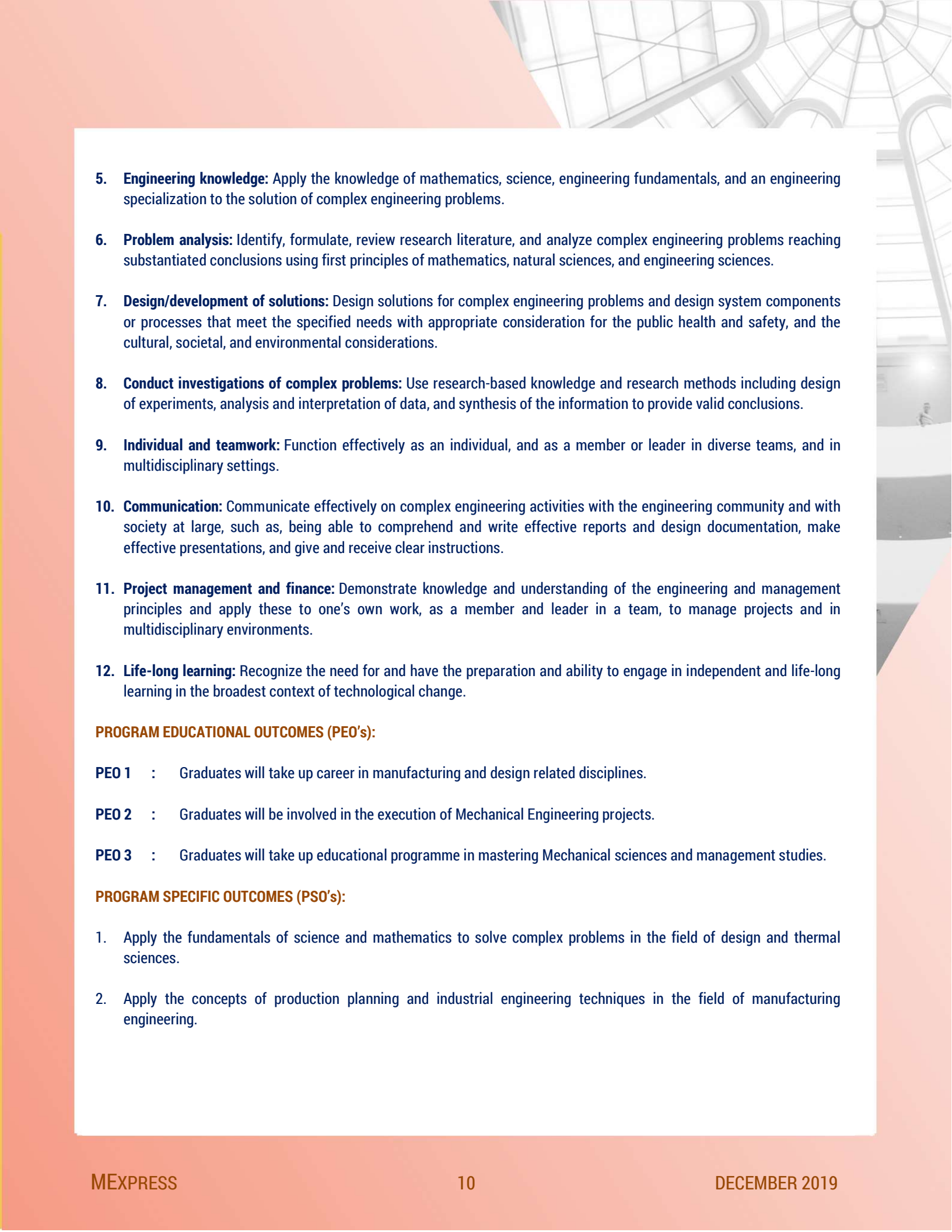
To emerge as a centre, that imparts quality higher education through the programme in the field of Mechanical Engineering and to meet the changing needs of the society.

DEPARTMENT VISION:

The department involves in sustained curricular and co-curricular activities with competent faculty through teaching and research that generates technically capable Mechanical Engineering professionals to serve the society with delight and gratification.

PROGRAM OUTCOMES (PO's):

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **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.
4. **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.

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5. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
 6. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
 7. **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.
 8. **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.
 9. **Individual and teamwork:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
 10. **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.
 11. **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.
 12. **Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM EDUCATIONAL OUTCOMES (PEO's):

- PEO 1** : Graduates will take up career in manufacturing and design related disciplines.
- PEO 2** : Graduates will be involved in the execution of Mechanical Engineering projects.
- PEO 3** : Graduates will take up educational programme in mastering Mechanical sciences and management studies.

PROGRAM SPECIFIC OUTCOMES (PSO's):

1. Apply the fundamentals of science and mathematics to solve complex problems in the field of design and thermal sciences.
2. Apply the concepts of production planning and industrial engineering techniques in the field of manufacturing engineering.