PANIMALAR ENGINEERING COLLEGE

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Approved by All India Council For Technical Education, New Delhi
POONAMALLEE, CHENNAI - 600 123.

DEPARTMENT OF MECHANICAL ENGINEERING

NEWSLETTER-THE TORQUE

.... Ready to be driven

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Inside this issue

FROM THE PRINCIPAL'S DESK

The spark of innovation often begins with a surprising combination, whether of materials, people, ideas, disciplines, or technology. At PEC, this alchemy is deliberately fostered, yielding a collaborative engine that continually breaks new ground in research. I applaud the Department of Mechanical Engineering for taking the initiative to publish this Department bulletin in a stylish format. I hope that this newsletter will provide a platform and opportunity for all Mechanical Engineering students and faculty to communicate and update information on recent breakthroughs in the area. I wish you all the best in your efforts to publish a large number of volumes.

FROM THE HOD'S DESK

I am delighted that our Mechanical Engineering Department is presenting this newsletter as a glimpse of the department's activities this semester. It is critical that students understand topics beyond the fundamentals in all professions so that they can succeed in the future. In general, this newsletter will assist staff and students in keeping up with current events. It will undoubtedly assist students in improving their skill set.

VISION

The Department of Mechanical Engineering will be globally recognized as a pioneer in Under Graduate Engineering Programs through its excellence in teaching and research, catering to the significant and evolving societal needs.

MISSION

Mission 1: To serve the society by developing competent engineers with outstanding leadership qualities and ethical values.
Mission 2: To address the progressive needs of the society and industry using modern engineering tools and cutting edge technologies.
Mission 3: To inculcate the importance of professional development within budding engineers through sustained learning.

PROGRAMME EDUCATIONAL OBJECTIVES

PEO 1: Graduates will contribute to the industrial and societal needs as per the recent developments using knowledge acquired through basic engineering education and training.
PEO 2: Graduates will be able to demonstrate technical knowledge and skills in their career with systems perspective, analyze, design, develop, optimize, and implement complex mechanical systems.
PEO 3: Graduates will be able to work in multidisciplinary environment developing complex mechanical systems.
PEO 4: Graduates will work as a team or as an individual with utmost commitment towards the completion of assigned task using apt communication, technical and management skills.
PEO 5: Graduate will recognize the importance of professional development by pursuing higher studies in various specializations.

PROGRAMME OUTCOMES

Engineering Graduates will be able to:

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.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

6. 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.

7. 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.

8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work: 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 SPECIFIC OUTCOMES (PSOS)

PSO1: Fundamental Domain Knowledge: Design mechanical systems in various fields of machine elements, thermal, manufacturing, industrial and inter disciplinary fields using engineering/technological tools.

PSO2: Usage of software programs: Resolve new challenges in Mechanical Engineering using modern computer tools and software programs.

PSO3: Continual learning and Research: Develop intellectual and technical solution to complex mechanical problems through continual learning and research.

DID YOU KNOW?

J.Blesson Joshua
IV Mech

In Australia, kangaroos outnumber people.

A $12 million space suit!!!!!!

From 24km (15miles), dolphins can detect underwater sounds

Only European continent lacks a desert.

HCCI

N.Abdul Rahman
II Mech

Homogeneous Charge Compression Ignition (HCCI) is a form of internal combustion in which well-mixed fuel and oxidizer (air) are compressed to the point of auto-ignition. As in other combustion, exothermic reaction releases chemical energy into a sensible form that could be transformed into work & heat in an engine.

Automotive-HCCI-Engine

HCCI combines characteristics of conventional gasoline & diesel engines. Gasoline engines combine homogeneous charge (HC) with spark ignition (SI), abbreviated as HCSI.

Diesel engines combine stratified charge(SC) with compression ignition (CI), abbreviated as SCCI.

As in HCSI, HCCI injects fuel during the intake stroke. However, rather than using an electric discharge (spark) to ignite a portion of the mixture, HCCI raises density and temperature by compression until the entire mixture reacts spontaneously.

Stratified charge compression ignition also relies on temperature and density increase resulting from compression. However, it injects fuel later, during the compression stroke. Combustion occurs at the boundary of the fuel and air, producing higher emissions, but allowing a leaner and higher compression burn, producing greater efficiency.

Controlling HCCI requires microprocessor control and physical understanding of the ignition process. HCCI designs achieve gasoline engine-like emissions with diesel engine-like efficiency. HCCI engines achieve extremely low levels of Nitrogen oxide emissions (NOx) without a catalytic converter. Unburned hydrocarbon and CO emissions require treatment to meet automotive emission regulations.

The most expensive car in the world - Maybach Exelero

A.Adithyan
III Mech

The Maybach Exelero is a one-off high-performance sports car made by Stola (now part of Blutec) in collaboration with DaimlerChrysler.

Because of its sleek black exterior and red and black carbon fiber coated interior, this 8,000,000 dollar car makes quite a statement in the parking lot of any car dealership. The vehicle is powered by a 700 horsepower engine and has a top speed of 218 miles per hour. The car appears to be extremely aerodynamic, based on the design of its hood and the shape of its trunk.

Seven Seas Explorer

-The Most Luxurious Cruise Ship

P.Akash
IV Mech

Seven Seas Explorer is an Explorer-class cruise ship currently operated by Regent Seven Seas Cruises, a subsidiary of Norwegian Cruise Line Holdings. Debuting in 2016, she became the first new-build ship for Regent in more than a decade and the largest ship to ever operate for Regent.

Length: 224 m

Construction started: 21 January 2015

Launched: 30 October 2015

Owner: Norwegian Cruise Line Holdings

Builder: Fincantieri

Crew: 552 crewmembers

Service speed: 19.4 knots (35.9 km/h; 22.3 mph); Maximum: 20.5 knots (38.0 km/h; 23.6 mph)

Carrying capacity: 55254 Gross Tonnage

With a one-of-a-kind, opulent 3,875-square-foot suite, extravagantly designed lounges and showplaces, and lavish gourmet restaurants, Regent Seven Seas Cruises is setting a new standard for luxury vacations with the launch of Seven Seas Explorer.

Do you know???

The man who invented cruise control was blind. His name was Ralph Teetor, and he was inspired to invent cruise control by his lawyer, who was apparently a very poor driver.

"Engineering without imagination sinks to a trade".