

## Department of Mechanical Engineering

### 1.3.1 Institution integrates cross-cutting issues relevant to Gender, Environment and Sustainability, Human Values and Professional Ethics into the Curriculum

#### Vision

To provide quality education of international standards in Mechanical Engineering and promote professionalism with ethical values, to work in a team and to face global challenges

#### Mission

- To provide an education that builds a solid foundation in Mechanical Engineering.
- To prepare graduates for employment, higher education and enable a lifelong growth in their profession.
- To develop good communication, leadership and entrepreneurship skills to enable good knowledge transfer.
- To inculcate world class research program in Mechanical Engineering.

#### Programme Specific Objectives

**PSO 1:** Graduates would be able to apply their knowledge in the domains of manufacturing, fluid and thermal sciences to solve engineering problems.

**PSO 2:** Graduates would be able to apply the principles of design and analysis on product design with the help of modern CAD/CAM tools.

**PSO 3:** Graduates would be able to apply the basic principles of engineering and management practices in various practical fields to engage themselves in research/ Industry/Society.

#### Programme Educational Objectives

1. Graduate Engineers shall have strong practical and theoretical exposure in the field of Mechanical Engineering and will contribute to the society through innovation and enterprise.
2. Graduate Engineers shall have global outlook and technological leadership, good employments or opt for higher studies/research and have creative thinking to initiate and develop innovative ideas.
3. Graduate Engineers shall have excellent teamwork, communication and interpersonal skills, having high morals and ethical values.

*Sunny*

Dr. SUNNY JOSEPH KALAYATHANKAL  
M.Tech, MCA, M.Sc, M.Phil, B.Ed  
Ph.D (Computer Science), Ph.D (Maths)  
PRINCIPAL

Jyothi Engineering College  
Cheruthuruthy P.O. - 679 531

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## Programme Outcomes

**PO 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PO 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.

**PO 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.

**PO 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.

**PO 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.

**PO 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.

**PO 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.

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

**PO 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO 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.

**PO 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.

**PO 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.

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Ph.D (Computer Science), Ph.D (Maths)  
PRINCIPAL  
Engineering College  
Cheruvuath, ... 531

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**List of courses that integrates cross cutting issues relevant to Gender, Environment and Sustainability, Human Values and Professional Ethics into the Curriculum**

Sl. No.	Subject	Subject Code	Curriculum	Deployment Strategy and Tool	Crosscutting Issues Integrated
1	Business economics	HS200	To familiarize the prospective engineers with elementary Principles of Economics and Business Economics. To acquaint the students with tools and techniques that are useful in their profession in Business Decision Making which will enhance their employability. To apply business analysis to the firm under different market conditions.	Chalk and talk method PPT	Human Values and Professional Ethics
2	Environmental impact assessment	CE482	To know the various types of environmental pollution. To make aware the impact due to various types of pollutants and their assessment technique	Chalk and talk method PPT	Environment and Sustainability
3	Disaster management	CE488	To provide an overview of the common hazards and their dynamics. To inculcate the basic concepts of disaster management	Chalk and talk method PPT	Environment and Sustainability
4	Project	ME492	To apply engineering knowledge in practical problem solving. To foster innovation in design of products, processes or systems. To develop creative thinking in finding viable solutions to engineering problems	PPT Presentation and implementation	Gender, Environment and Sustainability, Human Values and Professional Ethics
5	Life skill	HS 210	To develop communication competence in prospective engineers. To enable them to convey thoughts	Chalk and talk method PPT	Human Values and Professional Ethics

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**DR. SUNNY JOSEPH KALAYATHILAKAL**  
 M.Tech, MCA, M.Sc, M.Phil, Vido  
 M.Tech (CSE), Ph.D (Maths)  
 Ph.D (Computer Science),  
 PRINCIPAL  
 Jyothi Engineering College  
 Cheruthuruthy P.O.- 679 531

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			and ideas with clarity and focus. To develop report writing skills. To equip them to face interview & Group Discussion. To inculcate critical thinking process. To prepare them on problem solving skills.		
6	Introduction to Sustainable Engineering	BE 102	understand the engineering aspects of design with reference to simple products To foster innovation in design of products, processes or systems, To develop design that add value to products and solve technical problems.	Chalk and talk method PPT	Environment and Sustainability
7	Principles of Management	HS300	To develop ability to critically analyse and evaluate a variety of management practices in the contemporary context; To understand and apply a variety of management and organisational theories in practice; To be able to mirror existing practices or to generate their own innovative management.	Chalk and talk method PPT	Human Values and Professional Ethics
8	Design project	ME341	To understand the engineering aspects of design with reference to simple products To foster innovation in design of products, processes or systems To develop design that add value to products and solve technical problems	PPT	Gender, Environment and Sustainability, Human Values and Professional Ethics

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**Dr. SUNNY JOSEPH KALAYATHANKAL**  
M.Tech, MCA, M.Sc, M.Phil, B Ed  
Ph.D (Computer Science), Ph.D (Maths)  
PRINCIPAL  
Jyothi Engineering  
Cheruthuruthy P.O. 686531

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9	Advanced energy engineering	ME 403	To give an idea about global energy scenario and conventional energy sources. To understand solar, wind and Biomass energy. To know concepts of other renewable energy sources.	Chalk and talk method PPT	Environment and Sustainability
10	Seminar & project preliminary	ME 451	To study the various types of environmental pollution To study the impact of various types of pollutants and their assessment techniques	PPT	Gender, Environment and Sustainability, Human Values and Professional Ethics

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*Sunny*

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M.Tech, MCA, M.Sc, M.Phil, B.Ed  
Ph.D (Computer Science), Ph.D (Maths)  
PRINCIPAL  
Jyothi Engineering College  
Cheruthuruthy P.O. 679 531