



**Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY**  
Oorgaum, Kolar Gold Fields, Karnataka – 563120  
(Affiliated to VTU, Belgaum, Approved by AICTE - New Delhi)

**DEPARTMENT OF MINING**

**Program specific outcomes**

The graduates of Mining engineering program of Dr. Thimmaiah Institute of Technology should be able to attain the following at the time of graduation.

1. PSO 1: Achieve all-round optimization of various unit operations of mining, ranging from exploration to beneficiation.
2. PSO 2: Analyze and evaluate the techno-economic feasibility of mining projects and deep understanding of economic and environmental implications of mine design and operations.
3. PSO 3: Students will be fully equipped with skills and knowledge related to mine management, optimization techniques with multi-disciplinary skills for achieving sustainable development of the mineral industry.

**Program Outcomes**

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.

  
**PRINCIPAL**  
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**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.

Courses Integrating Human values, Professional Ethics and Environment Sustainability.

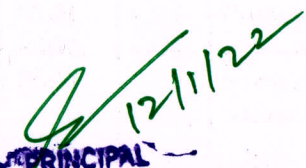
S.NO	COURSE	CURRICULUM	PO's	PSO's	CO's	Cross cutting issues relevant to Gender, Environmental sustainability, human values and professional ethics.
1	Drilling and Blasting	To educate students about different exploration methods used for mining operations.	1,2,3,6,7,8	PSO1	CO1-CO5	Professional ethics
2	Mine surveying	Helps students to apply conventional, optical and digital means of measurements to calculate volume, bearing and to outline the development and application of digital instruments in surface and underground surveying.	1,2,6,7,8	PSO1	CO1-CO5	Professional ethics
3	Rock mechanics	To understand and identify the various characteristics and behaviour of rocks due to stress and strain	1,2,3,6,7,8	PSO1, PSO2	CO1-CO4	Professional ethics
4	Mine ventilation	To educate students about occurrences of mine gases, dust and methane drainage. To apply principles of air flows and plan a proper mine ventilation systems and solve the ventilation network problems	1,2,3,6,7,8	PSO2	CO1-CO5	Human values
5	Occupational health and general safety	Helps students to Identify Occupational Health and Safety standards in mining. To Demonstrate safety related Rules, Regulations and Bye-Laws. Understand causes and preventions of Mine Accidents and Apply the basics of Accident Planning	6,7,8	PSO2	CO1-CO4	Human values, professional ethics, environmental sustainability
6	Ground control	Helps students to understand about the types and effects of stress distribution on underground openings by numerical methods and select support system by analyzing the different properties of rocks on underground excavation.	1,2,3,4,5	PSO1	CO1-CO5	Professional ethics
7	Underground mine planning and design	Helps students to understand the basic principles of mining law in Indian and role and influence of government on mining industries and identify software for mine planning and designing	1,2,3,4,5	PSO1, PSO2	CO1-CO3	Human values and Environmental sustainability
8	Environmental impacts of Mining	Helps students to understand various environmental issues due to mining projects and Identify and interpret suitable	6,7,8,9,10	PSO2	CO1-CO4	Environmental sustainability

  
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		preventive and control measures for environmental issues due to mining projects, ground vibration levels. Summarize reclamation, Environmental laws, land acquisition and corporate social responsibility while dealing.				
9	Mechanics of Materials	Helps students to understand effects of deformation of solids on nature and its impact on environment. It empowers student through logical thinking ability, understanding, conceptual design methods, optimization and analyzing skills in stress and strain effects in mining areas	1,2,4,5,7	PSO1, PSO2	CO1-CO5	Human values, Professional ethics & Environmental sustainability
9	Mine legislation	To understand the clauses in the Mines act, 1952 CO 2 Understand briefly the Mines Rules, 1955 CO 3 Understand the Mining regulations as per MMR,1961 and CMR,2017 Understand the Mines and Minerals (Development and Regulation) Act, 1952 and related rules	6,7,8,9,10	PSO3	CO1-CO5	Human values and professional ethics
10	Internship	Helps students to identify and explore recent trends in Mining engineering and prepare effective report on the selected topic, present and communicate and find solutions to the problems with respect to topic.	1,2,3,7,8,9,10,12	PSO1, PSO2, PSO3	CO1-CO3	Professional ethics and environmental sustainability
11	Project work	To identify, formulate and analyze engineering problems for the need to society and apply engineering, management and ethical principles for project management and economics.	1,2,3,4,5,7,8,9,10,11,12	PSO1, PSO2, PSO3	CO1-CO4	Professional ethics and environmental sustainability

  
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**DEPARTMENT OF ECE**

**Program Specific Outcomes (PSOs)**

**PSO1:** Apply the knowledge of signal processing and VLSI in communication and networking field.

**PSO2:** Apply modern tools for problem solving in electronic system design.

**Program Outcomes (POs)**

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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 modelling 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 need for sustainable development.
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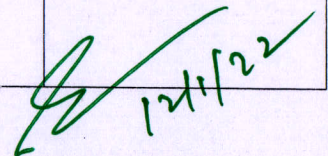
**Courses integrating Human values, Professional Ethics and Environmental Sustainability**

Sl. No.	Course	Curriculum	POs	COs	Crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum
1	Constitution of India, Professional Ethics and Cyber Law	To educate the students about the duties of citizen and government, engineering ethics and responsibilities.	1, 6, 8, 12	CO1-CO3	Human Values, Professional Ethics
2	Environmental Studies	To educate the students about environmental features, pollution control and natural resources.	7, 12	CO1-CO2	Environment and Sustainability
3	Technological Innovation Management And Entrepreneurship	To educate the students about the business ethics, corporate governance, entrepreneurship and management skills.	6, 8, 9, 10, 11, 12	CO1-CO5	Professional Ethics
4	Electromagnetic Waves	To educate the students about the analysis of electromagnetic field and waves.	1, 2, 3, 7	CO1-CO5	Environment and Sustainability  Through this course, the students were taught about the awareness of various frequency spectrum to maintain environmental sustainability.
5	Renewable Energy resources	To educate the students about the renewable energy usage and availability for environmental sustainability.	1, 6, 7, 12	CO1-CO5	Environment and Sustainability
6	Microwave and Antennas	To educate the students about analysis of various	1, 2, 3, 4, 7, 12	CO1-CO5	Environment and Sustainability



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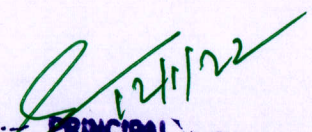
		parameters of microwave transmission lines, waveguides and antenna.			Through this course, the students were taught the advantages of using microwave transmission in specific frequency spectrums in maintaining environment and sustainability.
7	Satellite Communication	To educate the students about the satellite orbits, various parameters of satellite communication and about the national satellite system.	1, 2, 3, 7	CO1-CO4	Environment and Sustainability  Through this course, the students were taught about the safe and secure launch of satellites in space.
8	Wireless Cellular and LTE 4G Broadband	To educate the students about the implementation of 4G LTE network.	1, 2, 3, 4, 7, 10	CO1-CO6	Environment and Sustainability  Through this course, the students were taught about the utilization of 4G implementation without harm to the nature to maintain environment and sustainability.
9	Fiber Optics and Networks	To educate the students about different modes of optical communication and communication using optical fibers.	1, 2, 3, 4, 7, 12	CO1-CO5	Environment and Sustainability  Through this course, the students were taught about the use of fiber optical cables for data communication with safe environment practices.
10	Internship/Professional Practice	To identify and explore recent trends in Electronics & Communication Engineering, prepare and present the effective report on selected topic and answer the queries	1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12	CO1-CO2	Professional Ethics, Environment and Sustainability

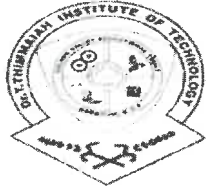
  
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		on the topic.			
11	Project Work	To identify, formulate and analyze engineering problems for the need of society and apply engineering, management and ethical principles for project management and finance.	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	CO1-CO3	Professional Ethics, Environment and Sustainability

  
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# Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

Department of Mechanical Engineering

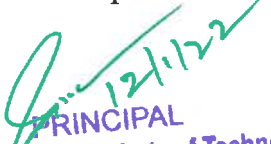
## Program Educational Objectives (PEOs)

- PEO1: Graduates shall have successful career in Mechanical Engineering with sound fundamental knowledge in science and engineering practice.
- PEO2: Graduates shall be professional in applying Mechanical engineering principles with a focus on innovation, research and having awareness of societal impact.
- PEO3: Graduates shall have ability to work in a team with professional ethics, good communication skills to achieve lifelong learning.

## Program Specific Outcomes (PSOs)

1. Have the ability to apply principles of Mathematics, Basic science and Engineering technology to solve Mechanical Engineering problems.
2. Ability to design components or processes in the areas of Mechanical Engineering.
3. Graduates will have the ability to perform thermal analysis and implement mechanical systems in domain specific industries.

  
Head of the Department  
Dept. of Mechanical Engineering  
Dr. T. Thimmaiah Institute of Technology,  
Gorgan, K.G.F. - 563 120.

  
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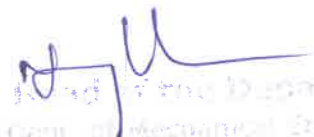
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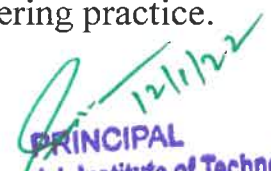
Department of Mechanical Engineering

## Program Outcomes (POs)

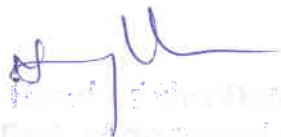
**Graduates will be able to:**


- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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Dept. of Mechanical Engineering  
Dr. T. Thimmaiah Institute of Technology,  
Gangaiah, K.G.F. - 563 120.

  
PRINCIPAL  
Dr. T. Thimmaiah Institute of Technology  
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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.
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PRINCIPAL  
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Courses that integrates with Gender, Environment and Sustainability, Human Values and Professional Ethics into the Curriculum.

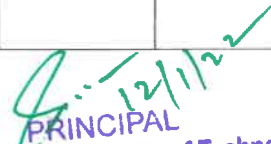
SI No	Subject	Subject Code	Curriculum	Deployment Strategy and Tool	PO	PSO	CO	Cross-Cutting issues integrated
1	Basic Thermodynamics	18ME33	Student will be able to learn about variation in temperature and its influence on the materials and the environment.	Black Board Teaching with PPT	PO 1,2,5,6,7,8,12	PSO 1,3	CO 1-5	Human Values, Professional Ethics, Environment Sustainability
2	Material Science	18ME34	Exposure on Material Crystal Structure and purpose of heat treatment on various material characteristics.	Black Board Teaching with PPT	PO 1,2,3,5,6,7,8,12	PSO 1,2	CO 1-5	Human Values, Professional Ethics, Environment Sustainability

  
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3	Fluid Mechanics	18ME43	Student will be able learn about fluid characteristics and its application.	Black Board Teaching with PPT	PO 1,2,3,5,8,12	PSO 1,2	CO 1-5	Human Values, Professional Ethics, Environment Sustainability
4	Applied Thermodynamics	18ME42	Student will be able to learn about variation in temperature and its influence on the materials and the environment.	Black Board Teaching with PPT	PO 1,2,5,6,7,8,12	PSO 1,3	CO 1-5	Human Values, Professional Ethics, Environment Sustainability
5	Management & Economics	18ME51	Inculcate the management strategy in the students to apply in any working environment.	Black Board Teaching with PPT	PO 1,2,3,4,5,7,8,11	PSO 1	CO 1-5	Human Values, Professional Ethics
6	Operations Management	18ME56	Inculcate the raw material process management from starting to finished goods and services.	Black Board Teaching with PPT	PO 1,2,6,9,10,11,12	PSO 1	CO 1-5	Human Values, Professional Ethics, Environment Sustainability
7	Non-traditional Machining	18ME641	Student exposes to different types of advanced machining process applied on various materials.	Black Board Teaching with PPT	PO 1,2,3,4,5,8,9	PSO 1,2	CO 1-4	Ethics, Human Values

  
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8	Finite Element Methods	18ME61	Student will be able to learn about how to build the prototype model through sustainable principles and analysis in different environments.	Black Board Teaching with PPT	PO 1,2,3,5,8,12	PSO 1,2	CO 1-4	Professional Ethics, Environment Sustainability
9	Total Quality Management	18ME734	Inculcate the management strategy and implement it in working environment.	Black Board Teaching with PPT	PO 1,2,3,5,6,7,8,12	PSO 1,2	CO 1-5	Human Values, Professional Ethics, Environment Sustainability
10	Control Engineering	18ME71	Enable the study on sensitivity, stability and performance of the control system in industry	Black Board Teaching with PPT	PO 1,2,3,4,10,11	PSO 1,2	CO 1-5	Human Values, Professional Ethics, Environment Sustainability
11	Energy Engineering	18ME81	Student exposes to concept of energy conservation principles applied to the environment.	Black Board Teaching with PPT	PO 1,2,3,5,6,7,8,12	PSO 1,2	CO 1-5	Human Values, Professional Ethics, Environment Sustainability
12	Tribology	18ME822	Student are exposed to material model design and its usage through sustainability and energy conservation.	Black Board Teaching with PPT	PO 1,2,3,5,8,12	PSO 1,2	CO 1-4	Human Values, Professional Ethics, Environment Sustainability

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