TKM COLLEGE OF ENGINEERING, KOLLAM – 691005, KERALA, INDIA

Common Program Outcomes (POs) of UG Programmes

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 investigation of complex problem**: 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 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, 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 project and in multidisciplinary environment.
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.

Note: *Please visit www.tkmce.ac.in and select* ACADEMICS *and then click on* DEPARTMENTS *for the detailed information on POs and PSOs of each programme run under each Department.*

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PROGRAMME SPECIFIC OUTCOMES (PSOs)

B. Arch Programme in ARCHITECTURE

Graduates of B.Arch. Program will be able to:

PSO1: Use critical thinking and analysis for Architectural Solutions.

PSO2: Exhibit technical skills and knowledge to address the practical problems of the society.

PSO3: Use appropriate techniques and means to make effective presentation and convey ideas

PSO4: Exhibit leadership, collaboration and stewardship of the environment with community and social responsibility.

B. Tech Programme in CHEMICAL ENGINEERING

PSO1: Analyze and apply the knowledge of Unit Operations and Unit Processes to function as process engineer.

PSO2: Design process equipments and develop processes considering safety, economic, environmental and ethical aspects.

PSO3: Communicating effectively with peers and society and function as a member or a leader for managing projects, adapting to technological changes.

B. Tech Programme in CIVIL ENGINEERING

PSO1: Apply domain and interdisciplinary knowledge to plan, analyse and design Civil Engineering systems.

PSO2: Prepare Civil Engineering project documents such as engineering drawings, cost estimates and schedules.

PSO3: Employ research methods to evolve sustainable solutions to address industrial and societal needs.

B. Tech Programme in COMPUTER SCIENCE AND ENGINEERING

PSO1: Apply mathematical and algorithmic principles, data structure concepts, software and hardware techniques in designing and developing optimized and secure computer based solutions.

PSO2: Design and develop system software and provide exposure to various tools and programming languages to facilitate efficient computing environment which adds to the ease of human life.

PSO3: Use the knowledge of various data processing, communication and intelligent systems to provide solutions to new ideas and innovations.

B. Tech Programme in ELECTRICAL AND ELECTRONICS ENGINEERING

PSO1: Design & select Electrical Machines and solid state drives for the implementation of energy efficient electrical installations.

PSO2: Design, develop & analyze mathematical models of transmission and distribution systems using state-of-the-art software tools as well as carry out hardware testing of power system components.

PSO3: Model and analyze steady state and transient performance of plants and measurement systems; and design controllers and compensators to achieve desired performance characteristics.

PSO4: Develop embedded systems for real life applications.

B. Tech Programme in ELECTRONICS AND COMMUNICATION ENGINEERING

PSO1: Sound knowledge and skill to analyze and solve problems in analog and digital electronic circuits, signal processing, communication and control systems.

PSO2: Competence in specialized software packages and tools useful for the analysis and design of electronic circuits, signal processing units and communication systems.

PSO3: Adaptable to the changing requirements and possess commendable interpersonal skills as a leader/member in a team keeping abreast of high degree of professional ethics, societal responsibilities and environmental outlook.

B. Tech Programme in MECHANICAL ENGINEERING

Graduates of the UG Mechanical Engineering Programme will be able to:

PSO1: Apply principles of mathematics, science and engineering to analyze and design thermal and mechanical systems

PSO2: Use the knowledge of manufacturing science, state-of-the-art tools and sustainable approaches to evolve processes and products

PSO3: Manage projects by applying principles of engineering management following ethical standards.

B. Tech Programme in MECHANICAL (PRODUCTION) ENGINEERING

Graduates of the UG Mechanical (Production) Engineering Programme will be able to:

PSO1: Apply principles of mathematics, science and engineering to analyze and design manufacturing and mechanical systems

PSO2: Use the knowledge of manufacturing science, state-of-the-art tools and sustainable approaches in product development

PSO3: Manage projects by applying principles of engineering management following ethical standards

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POs & PSOs OF PG PROGRAMMES

COMMON PROGRAMME OUTCOMES FOR ALL PG PROGRAMMES

PO1: An ability to independently carry out research /investigation and development work to solve practical problems

PO2: An ability to write and present a substantial technical report/document

PO3: Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program.

DEPARTMENT OF CIVIL ENGINEERING

M. Tech in STRUCTURAL ENGINEERING AND CONSTRUCTION MANAGEMENT

PROGRAM OUTCOMES

The graduates will be able to:

PO1: Independently carry out research/investigation and development work to solve practical problems.

PO2: Write and present a substantial technical report/document.

PO3: Demonstrate a degree of mastery in Structural Engineering and Construction Management.

PO4: Uphold principles of ethics and sustainable development.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

M. Tech in COMPUTER SCIENCE AND ENGINEERING

PROGRAM OUTCOMES

PO1: An ability to independently carry out research /investigation and development work to solve practical problems

PO2: An ability to write and present a substantial technical report/document

PO3: Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program.

PO4: Apply advanced knowledge acquired through the program to define, analyze and conceptualize computational problems, appraise possible alternatives ways of solving them and arrive at the most optimal solutions.

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PO5: Analyze and interpret observations obtained by performing experiments and simulations using traditional as well as contemporary tools and techniques in Computer Science and Engineering, so as to contribute individually or in groups for the development of solutions for problems in multidisciplinary domains.

PO6: Liaise with peer-groups, clients and society as a whole and ably communicate the results of the work.

PROGRAM SPECIFIC OUTCOMES

PSO1: Identify, analyze and synthesize prevalent scholarly literature to conduct research in the field of computer science for an ever-changing professional environment.

PSO2: To Engage in professional/ research practices in hardware and software to promote the development of innovative systems and optimized solutions.

DEPARTMENT OF MECHANICAL ENGINEERING

M. Tech in INDUSTRIAL REFRIGERATION AND CRYOGENICS

PROGRAMME OUTCOMES

PO1: An ability to independently carry out research /investigation and development work to solve practical problems

PO2: An ability to write and present a substantial technical report/document

PO3: Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program

PO4: Design and analyse cooling systems to solve real world engineering problems.

PO5: Choose and judiciously apply tools, techniques and resources to solve problems in refrigeration and cryogenic engineering

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MASTER OF COMPUTER APPLICATION (MCA)

Program Outcomes (POs)

1. **Computational Knowledge:** Apply knowledge of computing fundamentals, computing specialization, mathematics, and domain knowledge appropriate for the computing specialization to the abstraction and conceptualization of computing models from defined problems and requirements.
2. **Problem Analysis:** Identify, formulate, research literature, and solve complex computing problems reaching substantiated conclusions using fundamental principles of mathematics, computing sciences, and relevant domain disciplines.
3. **Design /Development of Solutions:** Design and evaluate solutions for complex computing problems, and design and evaluate systems, components, or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal, and environmental considerations.
4. **Conduct investigations of complex computing 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, adapt and apply appropriate techniques, resources, and modern computing tools to complex computing activities, with an understanding of the limitations.
6. **Professional Ethics:** Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.
7. **Life-long Learning**: Recognize the need, and have the ability, to engage in independent learning for continual development as a computing professional.
8. **Project management and finance:** Demonstrate knowledge and understanding of the computing 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.
9. **Communication Efficacy**: Communicate effectively with the computing community, and with society at large, about complex computing activities by being able to comprehend and write effective reports, design documentation, make effective presentations, and give and understand clear instructions.
10. **Societal and Environmental Concern:** Understand and assess societal, environmental, health, safety, legal, and cultural issues within local and global contexts, and the consequential responsibilities relevant to professional computing practices.
11. **Individual and Team Work:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.

12. **Innovation and Entrepreneurship:** Identify a timely opportunity and using innovation to pursue that opportunity to create value and wealth for the betterment of the individual and society at large.

PROGRAM SPECIFIC OUTCOMES (PSOs)

PSO1: Comprehend and interpret principles and mathematical foundations required for algorithm analysis, software engineering, database systems, Artificial Intelligence and networking and mobile technologies.

PSO2: Utilize knowledge and expertise gained to build software systems that solve problems, individually and in teams, cohering to the principles of Software development and adhering to moral and ethical values.

PSO3: Adapt to future technological changes and contribute to the society and scientific community through research initiatives to develop novel technologies.