St. Xavier's Catholic College of Engineering

Chunkankadai, Nagercoil – 629003.

Programme Educational Objectives (PEOs), Programme Outcomes (POs) and Program Specific Outcomes (PSOs)

Under Graduate Programmes

Programme Educational Objectives (PEOs)

B.E. Computer Science and Engineering:

1. To enable graduates to pursue higher education and research, or have a successful career in industries associated with Computer Science and Engineering, or as entrepreneurs.

2. To ensure that graduates will have the ability and attitude to adapt to emerging technological changes.

3. To ensure that the graduates will have strong moral principles, leadership qualities and thus redeem the society.

B.E. Electronics and Communication Engineering:

1. To enable graduates to pursue research, or have a successful career in academia or industries associated with Electronics and Communication Engineering, or as entrepreneurs.

2. To provide students with strong foundational concepts and also advanced techniques and tools in order to enable them to build solutions or systems of varying complexity.

3. To prepare students to critically analyze existing literature in an area of specialization and ethically develop innovative and research oriented methodologies to solve the problems identified.

B.E. Electrical and Electronics Engineering:

1. Build a solid foundation in mathematics, science, engineering and soft skills for diverse career and persistent learning.

2. Engage in life long process of learning and research to keep themselves abreast of new developments in the field of Electrical and Electronics engineering.

3. Have an ability to work in Multi-disciplinary Environment.

4. Practice their profession conforming to ethical values and environmentally friendly policies.

5. Model, design and develop a system and component or process the same to meet the needs of the society and industry within realistic constraints.

B.E. Civil Engineering:

1. To prepare students for successful careers in Civil Engineering field that meets the needs of

national and multinational companies.

2. To develop the confidence and ability among students to synthesize data and technical concepts and there by applying it in real world problems.

3. To develop students to use modern techniques, skill and mathematical engineering tools for solving problems in Civil Engineering.

4. To inspire the professionals with creative thinking and innovative research.

5. To follow the engineering qualities with the social and ethical values.

B.Tech. Information Technology:

1. To ensure graduates will be proficient in utilizing the fundamental knowledge of basic sciences, mathematics and Information Technology for the applications relevant to various streams of Engineering and Technology.

2. To enrich graduates with the core competencies necessary for applying knowledge of computers and telecommunications equipment to store, retrieve, transmit, manipulate and analyze data in the context of business enterprise.

3. To enable graduates to think logically, pursue lifelong learning and will have the capacity to understand technical issues related to computing systems and to design optimal solutions.

4. To enable graduates to develop hardware and software systems by understanding the importance of social, business and environmental needs in the human context.

5. To enable graduates to gain employment in organizations and establish themselves as professionals by applying their technical skills to solve real world problems and meet the diversified needs of industry, academia and research.

B.E. Mechanical Engineering:

1. Have a successful career in mechanical engineering and allied fields.

2. Have expertise in the areas of design, thermal, materials, manufacturing and industrial engineering.

3. Contribute towards technological development through academic research and industrial practices.

4. Practicing their profession with good communication, leadership, ethics and social responsibility.

5. Adapt the evolving technologies through lifelong learning.

Programme Outcomes (POs)

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)

B.E. Computer Science and Engineering:

1.To analyze, design and develop computing solutions by applying foundational concepts of Computer Science and Engineering.

2.To apply software engineering principles and practices for developing quality software for scientific and business applications.

3.To adapt to emerging Information and Communication Technologies (ICT) to innovate ideas and solutions to existing/novel problems.

B.E. Electronics and Communication Engineering:

1. To analyze, design and develop solutions by applying foundational concepts of electronics and communication engineering.

2. To apply design principles and best practices for developing quality products for scientific and business applications.

3. To adapt to emerging information and communication technologies (ICT) to innovate ideas and solutions to existing/novel problems.

B.E. Electrical and Electronics Engineering:

1. Utilize the Technological advancements in the field of modern Power Systems and formulate reliable and feasible solutions towards the eco-friendly and challenging environment.

2. Design and analyze fundamental Electronics and Embedded systems for real-world problems and develop smart products.

3. Apply recent Technology to control Electrical Machines with the aid of solid state devices to enhance energy conservation and sustainability.

B.E. Civil Engineering:

1.Demonstrate knowledge in core areas of civil engineering such as planning, designing, estimating and carrying out construction.

2.Apply the concept of sustainable development in the context of environment, economic and social requirements.

3.Develop research activities, consultancy services with critical thinking, professional development and lifelong learning.

B.Tech. Information Technology:

1. Design optimal solutions for the challenges in the area of Information and Communication Engineering using programming proficiencies.

2. Apply the modelling and prediction tools, techniques and resources to analyze the real-world problems.

3. Develop computing systems using the software design and development skills to enhance the lifestyle of the public.

B.E. Mechanical Engineering:

1. Ability to design, analyze and evaluate mechanical components.

2. Ability to design and evaluate the performance of thermal systems and turbo machineries.

3. Ability to plan, design and execute processes to manufacture various components and systems with quality assurance.

4. Ability to apply modern management techniques with a concern for environment upholding ethical values.

Post Graduate Programmes

Programme Educational Objectives (PEOs)

Master of Business Administration:

1. To have a thorough understanding of the core aspects of the business.

2. To provide the learners with the management tools to identify, analyse and create business opportunities as well as solve business problems.

3. To prepare them to have a holistic approach towards management functions.

4. To motivate them for continuous learning.

5. To inspire and make them practice ethical standards in business.

Master of Computer Applications:

1. To prepare students to excel in the computing profession by providing solid technical foundations in the field of computer applications.

2. To provide students various computing skills like the analysis, design and development of innovative software products to meet the industry needs.

3. To motivate students to pursue lifelong learning and to do research as computing professionals and scientists.

4. To motivate students to communicate and function effectively in teams in multidisciplinary fields within the global, societal and environmental context.

Program Outcomes (POs)

M.E. Applied Electronics:

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

2. Write and present substantial technical report/document.

3. Demonstrate a degree of mastery over the electronic system design at a level higher than the requirements in the appropriate bachelor program.

4. To critically evaluate the design and provide optimal solutions to problem areas in advanced signal processing, digital system design, embedded systems and VLSI design.

5. To enhance and develop electronic systems using modern engineering hardware and software tools.

6. To work professionally and ethically, adapt to technological changes, communicate effectively, work collaboratively in a team as also lead the team and practice responsibly in a global environment in the area of applied electronics.

M.E. Construction Engineering and Management:

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

2. Write and present substantial technical report/document.

3. Demonstrate a degree of mastery over the area of Construction Engineering and Management.

4. Effectively formulate, plan, schedule, arrive quantities and cost and control quality for the existing and new construction projects.

5. Solve problems in Construction Engineering and Management using modern Engineering tools, software and equipment by applying appropriate techniques.

6. Function effectively as a professional with ethical attitude, effective communication skills, leadership skills and multi-disciplinary approach to solve Construction Engineering and Management issues to broader social context.

M.E. Energy Engineering:

1.To prepare students to excel in research or to succeed in energy engineering profession through global, rigorous post graduate education.

2.To provide students with a solid foundation in mathematical, scientific and engineering fundamentals required to solve energy engineering problems.

3.To train students with good scientific and engineering knowledge so as to comprehend, analyse, design and create novel products and solutions for the real-life problems.

4.To inculcate students in professional and ethical attitude, effective communication skills, teamwork skills, multidisciplinary approach and an ability to relate energy engineering issues to broader social context.

5. To provide students with an academic environment aware of excellence, leadership, written ethical codes and guidelines and the life-long learning needed for a successful professional career.

M.E. Computer Science and Engineering:

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

2. Write and present substantial technical report/document

3. Demonstrate a degree of mastery over the area as per the specialization of the program at a level higher than the requirements in the appropriate bachelor program

M.E. Communication Systems:

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

2. Write and present substantial technical report/document.

3. Demonstrate a degree of mastery over the techniques in the area of communication system.

4. Analyze and design the subsystems in RF, signal processing, modern communication systems and networks.

5. Solve problems in communication system design using advanced hardware and software tools.

6. Measure electromagnetic interference and mitigate its effects.

M.E. Power Electronics and Drives:

1. Acquire sound knowledge in power electronics and drives.

2. Analyse power electronics and drives related engineering problems and synthesize the information for conducting high level of research.

3. Think widely to offer creative and innovative solutions of engineering problems that are inconformity with social and environmental factors.

4. Extract the new methodologies by carrying out the literature survey, proper design and conduction of experiments, interpret and analyse the data to arrive at meaningful research methodologies in power electronics and drives.

5. Learn and apply modern engineering and IT tools to solve complex engineering problems related to power converters and electric drives.

6. Ability to form, understand group dynamics and work in inter-disciplinary groups in order to achieve the goal.

7. Ability to communicate effectively in appropriate technical forums and understand the concepts and ideas to prepare reports, to make effective presentations.

8. Ability to update knowledge and skills through lifelong learning to keep abreast with the technological developments.

9. Follow the professional and research ethics, comprehend the impact of research and responsibility in order to contribute to the society.

10. Understand the leadership principles and subject oneself to introspection and take voluntary remedial measures for effective professional practice in the field of power electronics and electric drives.

M.E. Medical Electronics:

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

2. Write and present substantial technical report/document.

3. Demonstrate a degree of mastery over the area as per the specialization of the program at a level higher than the requirements in the appropriate bachelor program.

4. Identify and solve Biomedical Engineering problems related to human anatomy that address contemporary issues within a global and societal context for the development of low cost indigenous biomedical devices.

5. Ability to design the techniques and tools of Medical Electronics Engineering to address the needs of technology in healthcare domain and understand the relevant technical, professional, and ethical issues.

6. Understand and develop the competence for continuous learning in the area of design, biosignal processing, Medical Imaging, Radio Therapy and related equipment.

M.E. Structural Engineering:

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

2. Write and present substantial technical report/document.

3. Demonstrate a degree of mastery over the techniques in the area of Structural Engineering.

4. Analyze, design and create novel products and solutions for the real life problems in Structural Engineering.

5. Solve problems in Structural design using modern Engineering equipment and software tools by applying appropriate techniques.

6. Function effectively as a professional with ethical attitude, effective communication skills, team work skills, leadership skills and multi-disciplinary approach to solve Structural Engineering issues to broader social context.

Master of Business Administration:

1. Apply Knowledge of management theories and practices to solve business problems.

2. Foster analytical and critical thinking abilities for data based decision making.

3. Ability to value based leadership.

4. Ability to understand, analyze and communicate global, economic, legal and ethical aspects of business.

5. Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment.

Master of Computer Applications:

1. **Computational knowledge**: Apply knowledge of computing fundamentals, computing specialisation, mathematics, and domain knowledge appropriate for the computing specialisation to the abstraction and conceptualisation of computing models from defined problems and requirements.

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. **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

7. **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.

8. **Professional Ethics:** Understand and commit to professional ethics and cyber regulations, responsibilities, and norms of professional computing practices.

9. **Individual and Team Work:** Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary environments.

10. **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.

11. **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.

12. **Life-long Learning:** Recognise the need, and have the ability, to engage in independent learning for continual development as a computing professional.

Dr. J. MAHESWARAN, M.E. Ph.D. FIE. MISTE.
PRINCIPAL
SLXAVIER'S CATHOLIC COLLEGE OF ENGINEERING
CHUNKANKADAI
NAGERCOIL - 629 003