

Electronics and Instrumentation Engineering Programmes

B.E. (Electronics and Instrumentation Engineering)

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

PE01 To nurture in a spirit of self-confidence, Tolerance and adaptability among the graduates pursuing this programme

PE02 To inculcate echelons of technical skill and academic excellence for enabling the graduates to choose their field of expertise.

PE03 To foster curricular and extra-curricular attributes with a perspective to ensure the graduates accomplish their professional career.

PE04 To promote awareness among graduates for lifelong learning and inculcate professional ethics.

PROGRAMME OUTCOMES (PO)

After the successful completion of the B.E. (Electronics and Instrumentation Engineering) degree programme, the students will be able to:

PO1 Integration of knowledge Apply the knowledge of mathematics, science and engineering fundamentals in analog and digital electronic systems, instrumentation and control engineering.

PO2 Problem analysis Formulate, solve and analyze complex problems in electrical circuits, electronic systems, instrumentation and control engineering.

PO3 Design and development of solutions Apply the acquired knowledge for designing systems/processes to address the specific needs and to pull off solution, with appropriate consideration for health, safety, and environmental issues.

PO4 Use of modern tools and techniques Select and apply appropriate modern engineering tools including prediction and modelling software packages, Distributed Control System, Programmable Controllers and advanced processors.

PO5 Collaborative and multidisciplinary approach Gain exposure to attain knowledge and understand inter disciplinary and multidisciplinary engineering sciences.

PO6 Ethical practices Acquire professional and intellectual integrity, professional code of conduct, ethics on professional practices, understanding responsibilities and norms for sustainable development of society.

PO7 Communication skills Interact with the engineering community and with society at large, regarding intricate engineering activities on technical perspectives and emerge as an efficient motivator.

PO8 Project management Understand the engineering and management concepts and demonstrate the knowledge as an entrepreneur or member/leader in teams and multidisciplinary tasks in their profession.

PO9 Lifelong learning Appreciate the need for self preparation and life-long learning independently in the broadest context of technological challenges.

PO10 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.

PO11 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.

PO12 Individual and team work Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

M.E. PROCESS CONTROL AND INSTRUMENTATION ENGINEERING

PROGRAMME EDUCATIONAL OBJECTIVES (PEOS)

The major objectives of the M.E (Process Control & Instrumentation) programme are to equip the students with adequate knowledge and skills in the areas of Process Control and Instrumentation and prepare them for:

1. Imparting practical knowledge in process control, design of instrumentation systems and contribute to technological development.
2. Attaining professional competency to address the technological needs of society and industrial problems.
3. A successful career in Process Control and Automation industries, R&D organizations and Academic Institutions.
4. Showing the society for life-long self-governing and thoughtful learning skills in their career.
5. Exhibiting their potential in project management, collaborative and multidisciplinary task in their profession.

PROGRAMME OUTCOMES (POs)

A student who has undergone the M.E (Process Control & Instrumentation) program would have acquired abilities to

PO1:ENGINEERING KNOWLEDGE Apply knowledge of mathematics, science and engineering in practice for instrumentation, control and automation with an ability to discriminate, evaluate, analyze and synthesize existing and new knowledge and integration of the same for enhancement of knowledge.

PO2:DECISIVE THINKING Identify, analyse, formulate and solve complex engineering problems in instrumentation, control and automation engineering critically, to make intellectual and/or creative advances for conducting research in a wider theoretical, practical and policy context to handle emerging technologies relating to process industries.

PO3: PLAN AND PROGRESS Solve instrumentation, control and automation problems, evaluate a wide range of potential solutions for those problems and arrive at feasible, optimal solutions after considering public health and safety, cultural, societal and environmental factors.

PO4: RESEARCH SKILLS Extract the research skill to unfamiliar problems through literature survey and experiments, and apply appropriate research methodologies, techniques and tools, design, conduct experiments, analyze and interpret data, demonstrate higher order skill and view things in a broader perspective, contribute individually/in group(s) to the development of scientific/technological knowledge in instrumentation, control and automation domains.

PO5: USAGE OF MODERN TOOLS Learn, Develop, Choose, apply appropriate techniques and resources, modern engineering and IT tools, including prediction and modelling, to complex instrumentation and control, automation engineering activities with an understanding of the limitations.

PO6: COLLABORATIVE AND MULTIDISCIPLINARY WORK Collaborative and Multidisciplinary work and understanding of group dynamics, recognize opportunities and contribute positively to scientific research, demonstrate a capacity for decision-making based on open mindedness, objectivity and rational analysis in order to achieve common goals.

PO7: PROJECT MANAGEMENT Demonstrate project management knowledge by applying the same to one's own work, as a member and leader in a team, manage projects by considering economical and financial factors efficiently in respective disciplines and multidisciplinary environments.

PO8: SOFT SKILLS Communicate confidently and effectively with the peers and the society at large regarding complex engineering activities, be able to comprehend and write effective reports, design documentation by adhering to appropriate standards, make effective presentations.

PO9: LIFE-LONG LEARNING 1465 Recognise the need for Life-long Learning with a high level of enthusiasm and commitment to improve knowledge and competence continuously and independently.

PO10: ETHICAL PRACTICES AND SOCIAL RESPONSIBILITY Ethical practices and social responsibility, professional code of conduct, ethics of research and scholarship, consideration of the impact of research outcomes on professional practices and an understanding of responsibility to contribute to the community for sustainable development of society.

PO11: INDEPENDENT AND REFLECTIVE LEARNING Independent and reflective learning, observe and examine critically the outcomes of one's actions and make corrective measures subsequently, and learn from mistakes without depending on external feedback.

M.E. REHABILITATIVE INSTRUMENTATION ENGINEERING

PROGRAMME EDUCATIONAL OBJECTIVES (PEO)

The major objectives of the M.E (Rehabilitative Instrumentation) programme are to implement Science and Engineering principles in the broad area of medical instrumentation to improve healthcare delivery to human in association with physicians and surgeons and prepare them for:

1. Comprehend the fundamental concepts in Bio Medical Engineering.

2. Apply knowledge of Engineering, biology, and Biomechanical principles to the design, development, and evaluation of various medical devices for cost effective diagnosis and treatment of various ailments.

3. To help the society and specifically the physically challenged person for their comfortable life style.

PROGRAMME OUTCOMES (PO)

A student who has undergone the M.E (Rehabilitative Instrumentation) program would have acquired abilities to

1. Possess a good knowledge of basic science (including medicine), mathematics & Engineering required for specific topics in Rehabilitation Engineering.

2. Have skill to use of different types of sensors and measurement of various physiological parameters.

3. Possess ability to provide effective solutions through data interpretation, design & implementation (as applicable to a given topic/scenario).

4. Able to identify the latest tools (hardware &/or software/program &/or materials) available, towards an effective biomedical solution to a given problem.

5. Understand the current healthcare necessities & the associated multidisciplinary environment and sustainability, and an ability to provide appropriate engineering-solutions especially for Physically Challenged persons.
6. Able to take leadership in investigating complex healthcare problems by putting together, a cohesive multidisciplinary team.
7. Able to understand about various imaging modalities used in the Hospitals.
8. Learn some of the latest techniques that can be applied to research.
9. Focuss the experience through Hospital training and projects in one or more areas of advanced research.

M.E. MICROELECTRONICS AND MEMS PROGRAMME

PROGRAMME EDUCATIONAL OBJECTIVES

PEO1: To provide a pool of post graduate engineers who are specialists in the modeling and design of basic and advanced semiconductor devices.

PEO2: To create a knowledge society in the area of design, fabrication and characterization of micro electro mechanical systems such as microsensors and micro actuators by introducing various simulation tools and micro fabrication technologies.

PEO3: To train a group of engineers who would be capable of supporting Indian electronics industry to develop advanced and indigenous microsystems for the modern society.

PEO4: To train engineers who would design and develop nano electronic circuits and nano electro mechanical systems for the future world.

PEO5: To inculcate students a professional approach to problem solving, using analytical, academic, and communication skills effectively, with special emphasis on working in teams.

PEO6: To encourage students to acquire breadth of knowledge, including the multidisciplinary nature of microelectronic engineering as well as the broad social, ethical, safety, and environmental issues within which engineering is practiced.

PEO7: To lay the foundation for a strong desire to achieve leadership positions in industry or academia.

PROGRAMME OUTCOMES:

After the successful completion of the M.E. (Microelectronics and MEMS) degree programme, the students will be able to:

PO1: Understand the fundamental scientific principles governing semiconductor electronic devices, modelling of such devices and their incorporation into modern integrated circuits.

PO2: Provide the knowledge of semiconductor manufacturing process to utilize thin film processing methods to fabricate and packaging electronic components, communication devices and micromechanical devices. Understand the relevance of a process or device, either proposed or existing, to current manufacturing practices.

PO3: Develop in-depth knowledge in existing or emerging areas of the field of Nano electronics such as device engineering, circuit design, lithography, materials and processes, yield, and manufacturing.

PO4: Understand the basic concepts of MEMS technology, an interdisciplinary field related to technologies, used to fabricate nano to micro scale devices and system-on-a-chip that embed electrical,

mechanical, chemical, and hybrid mechanisms to realize devices and systems for a broad array of applications such as physical sensors, biomedical systems, and complex multifunctional nano-micro systems.

PO5: Introduce students to the techniques of micro and nano-manufacturing, design and multiphysical simulation tools for the analysis of micro and nanostructures and study of their behaviour and the classification of micro and nano sensors and actuators in integrated technology.

PO6: Produce Engineers with the highly specialized knowledge and expertise that they need to design, fabricate, test and package sensors and actuators of micro and nano scale using conventional semiconductor technologies and other emerging technologies.

PO7: Develop process engineer to understand electrical engineering design rules, electronic material properties, and the physics using modern VLSI design tools.

PO8: Produce post graduates who have strong engineering knowledge and technical competence to use techniques, skills and modern engineering tools that allow them to work effectively on the design of VLSI circuits that process Analog, Digital and mixed signals for Communications, Signal Processing and Control Systems.

PO9: Induce an enthusiasm for learning and develop continuous improvement of skills throughout one's career to adopt and accept changes within the field.