

## **Department of Electronics and Instrumentation Engineering Program Outcomes (POs)**

**The program demonstrates that:**

**a. Knowledge of Basic Sciences and Basic Engineering:**

The students shall be able to apply the principles of Basic Sciences and Mathematical skills in learning in Basic Engineering subjects from allied branches like Electrical engineering, Electronics etc. The knowledge gained thus enables the students to apply them in learning the core branch viz. The Instrumentation Engineering.

**b. Computational Skills:**

The students shall acquire Analytical Thinking; Problem solving abilities, get exposure to the modern computational procedures and apply them in the core Instrumentation Engineering.

**c. Design and Development of Solutions:**

The background knowledge gained, the Analytical and computational skills acquired by the students shall enable the students to apply them in the core Instrumentation Engineering to design Electronic circuits, highly sensitive sensors networks for monitoring and control of various physical, chemical, pharmaceutical and Industrial parameters and processes.

**d. Conduct of Investigations into Complex Problems:**

The students shall be able to apply the knowledge and adopt research methodologies for the modernization of existing designs of Instruments, design sophisticated instrumentation systems interfaced to dedicated embedded controllers or High-end computers. They shall be able to Acquire, Analyze, Interpret and Control any complex processes or problems in Industry and R&D.

**e. Usage of Modern Tools:**

The students gain expertise in the utilization of modern software tools like C, JAVA, Multisim, Signal and Image processing tools for applications in communications, Biomedical (ECG, EEG, MRI) etc; Hardware gadgets like the Digital Storage Oscilloscopes, Function Generators, Spectrum Analyzers; and ultra-sensitive instruments like the UV-VIS and Infra-Red Spectrophotometers, Chromatographs, Process control stations etc. for applications in Industry and R&D.

**f. Engineers and Society:**

The students of engineering should be motivated to utilize their Scientific, Technological, Computational and Instrumentation skills for the better addressing the societal needs. Design new sophisticated instruments for the high-end Research and Process Industries, Pharmaceutical, Bio-medical fields. They should utilize their expertise to develop indigenous technologies, instruments, gadgets, affordable by common people. Design inexpensive healthcare systems and extend the same to the remote areas through tele-medical network system making use of INSAT facility.

**g. Environment and Sustainability:**

Instrumentation Engineering is a multi-disciplinary branch. The students shall be motivated to utilize their knowledge for design of highly sensitive and low energy consumption, low radiation emitting, lower environment polluting instruments, operating on renewable energy sources and implement all such measures to **sustain the quality of the environment.**

**h. Ethics:**

The students are motivated to follow a code of ethics and moral perspectives at the individual level as well as at the professional level to protect the interests of all the stakeholders, with a concern for societal responsibilities.

**i. Individual and Team work:**

Communication skills, Aptitude development programs, Team activities like POGIL, Seminar Presentations etc contribute greatly for the development of individual talents/skills. Involvement in Professional, Cultural, Sports activities provided in the institute shall also develop capabilities of a student to mould oneself as an Individual member, Team leader or an Organizer.

**j. Communication Skills:**

The intensity of inputs (Listening, Speaking, Reading and Writing Skills) inputs and trainings imparted through all these activities, the students shall acquire excellent communication skills both orally as well as writing. They shall be able to transform their innovative ideas into excellent technical reports for presentation/publication in seminars/journals.

**k. Project Management and Finance:**

The students shall be able to conceptualize ideas, formulate projects, visualize their execution and realized final product. The students shall demonstrate the skills required for drafting of proposals for projects with thorough understanding of the procurement plans (materials, software, hardware), project management and financial allocations and management during the execution of the project.

**l. Life-Long learning:**

The students shall be motivated to keep themselves in-tune with the contemporary changes in technological processes through life-long learning and also contribute their expertise for the benefit of the current stake holders and the society.

## **Program Education Objectives (PEOs)**

- I.** To provide students with a solid foundation in Basic Sciences, Mathematics to analyze, synthesize and evaluate information to acquire expertise in core areas of Instrumentation Engineering.
- II.** To acquaint the students with the modern professional practices such as aptitude, analytical and logical skills development and enhancing the abilities for effective communication. Collaboratively working in diverse teams. Nurturing ethical and moral values, successful planning and management of personal and professional career objectives and continuous all round personality development through exploration of knowledge.
- III.** To prepare the students to achieve a high level of technical expertise in the allied fields of Basics of Electrical Engineering; Electronics (Analog and Digital); Computer Hardware, Software and interfacing techniques; Sensors, Signal conditioners and measurements; Optical and Laser based Instruments; Pharmaceutical and Bio-medical Instruments; Control systems, Industrial and process control and automation techniques.
- IV.** To impart expertise by offering electives in advanced courses like PLC, DCS, SCADA systems being adopted by all modern industries.
- V.** To provide opportunities for students to learn multidisciplinary subjects such as Embedded systems, VLSI Design, Telemetry & Tele-control, Robotics, Virtual Instrumentation (Lab VIEW).
- VI.** To establish Excellent laboratories to gain acquaintance with the practical implementation of the theoretical concepts through laboratory practices by bringing the real world conditions into the academics. Introduction of radical curriculum revision and lab-linkage courses; Designing open-ended experiments creating opportunity to explore beyond curriculum.
- VII.** To inculcate zeal for lifelong pursuit of knowledge through higher studies and Research. Motivate them to be an entrepreneur by continued interaction and support even after the completion of the course. Establishment of incubation centers in the institute for any enterprising students.