

**DEPARTMENT OF
INSTRUMENTATION AND CONTROL
ENGINEERING
(Established in 1993)**



Department Attributes

- Committed faculty with good working culture
- State of the art laboratories
- Recognized as a research oriented department by R&D organizations and Research Institutions in India
- Mechanism to review and update the Syllabus with the changing trends
- Consistent placement records for students
- Full & effective utilization of granted funds

Academics

- Under Graduate Programme:
 - B.Tech. in Instrumentation and Control Engineering
 - Intake: 60
 - Number of batches passed out: 9
- Post Graduate Programme:
 1. M.Tech. in Process Control and Instrumentation
(Joint program with Chemical Engg.)
 - Intake: 18
 - Number of batches passed out: 7
 2. M.Tech. in Micro Technology & Embedded System
 - Proposed intake: 25
 - Year of commencement: 2008

Academics

- Research Programme:
 1. M.S. in Instrumentation and Control Engg.
Number of Full time scholars: 1
 2. Ph.D. in Instrumentation and Control Engg.
Number of Full time scholars: 2
Number of Part time scholars: 10

Academics

Faculty

- Professor : 1
- Assistant Professors : 4
- Senior Lecturers : 3
- Lectures : 4

Supporting Staff

- Technical Staff : 4
- Ministerial Staff : 6

Laboratories in the Department

Sensors & Transducers Lab

Focus: Sensor Characteristics and Signal Conditioning

Facilities Available:

Total Cost: Rs.15 lakhs

- Accelerometers
- Charge Amplifiers
- LVDT & Load cells
- Strain Gauges
- Pressure Transducers
- Torque Measuring Systems
- Speed Measurement system
- Sound Level Meter
- Temperature Calibrator
- Ultrasonic Proximity sensor Model
- Temperature probes – RTDs, Thermocouples & Thermistors
- Capacitive Transducer
- Hall Effect Transducer



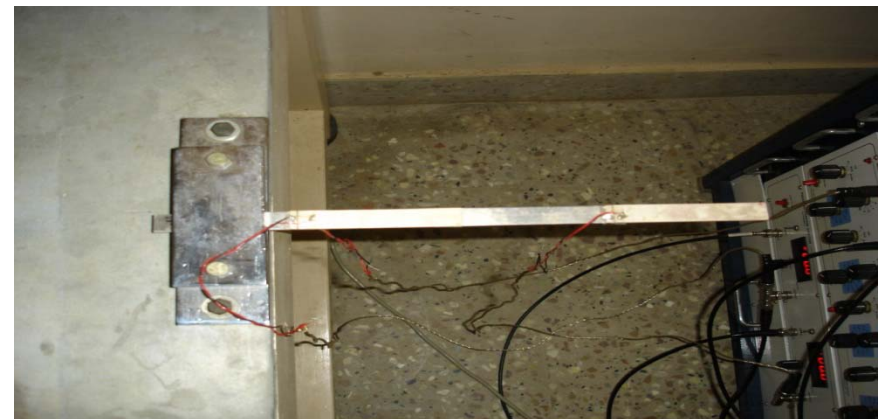
Control Systems Lab

Focus: Control Design, Experimentation with Electrical & Electromechanical Systems

Facilities Available:

Total Cost: Rs.40 lakhs

- Inverted pendulum
- Rotary servo plant with Gyro / Stable platform
- MATLAB Real Time Workshop
- dSPACE 1104 Controller Board
- Piezoelectric sensors and actuators
- SMA actuators
- Articulated robot arm with control system
- Process Control Simulator
- Digital Storage Oscilloscopes & FFT signal Analyzers
- Digital Signal Processing Kits
- Cross C compiler for TMS 320 C3X



Process Control Lab

Focus: Design and implementation of controllers for different process variables

Total Cost: Rs.25 lakhs

Facilities Available:

- Programmable logic controllers
- Flow process control trainer
- Pilot Distillation Column
- Multi Process Trainer
- Precision Field Pressure Calibrators
- Level Process Trainer
- Pressure Process Trainer
- Temperature Process Trainer
- Virtual DCS
- Centralized pneumatic and water supply



Instrumentation Lab

Focus: Design and Calibration of Instrumentation Systems

Total Cost: Rs.15 lakhs

Facilities Available:

- Differential Pressure Transducer
- Level measurement using Capacitance probe
- Dead weight tester
- Masibus Universal Calibrator
- Dual Block Calibrator
- Thermal Source
- 8½ digit Multimeter
- Data Logger



Bio-Medical Engineering Lab

Focus: Signal Acquisition, Analysis and study of Biopotential

Total Cost: Rs.15 lakhs

Facilities Available:

- Data acquisition & control card
- Mixed Signal Oscilloscope
- Spirometer (pulmonary function analyzer)
- ECG, EMG and Glucometer measurement modules
- Pulse oximeter
- Colour frame grabber with CCD color camera



Microprocessor & Microcontroller Lab

Focus: Source code design and interfacing concepts

Facilities available:

Total Cost: Rs.18 lakhs

- 8, 16 Bit Microprocessor and Microcontroller development kits
- Assembler & communication packages
- Cross assemblers
- IC Tester
- Digital Storage Oscilloscopes



Virtual Instrumentation Lab

Focus: Modeling and Simulation of Virtual Real Time Systems

Facilities Available:

- Virtual Instrumentation software (LabVIEW 7.1)
- Distributed I/O modules
- PXI Chassis
- Real Time PXI embedded controller
- PXI embedded controller
- PXI remote controller
- LabVIEW 7.0 Full Development system
- LabVIEW Order analysis tool set, PID control tool set, Signal processing tool set, Sound and vibration tool set
- Multifunction data acquisition cards (PCI & PXI)

Total Cost: Rs.15 lakhs



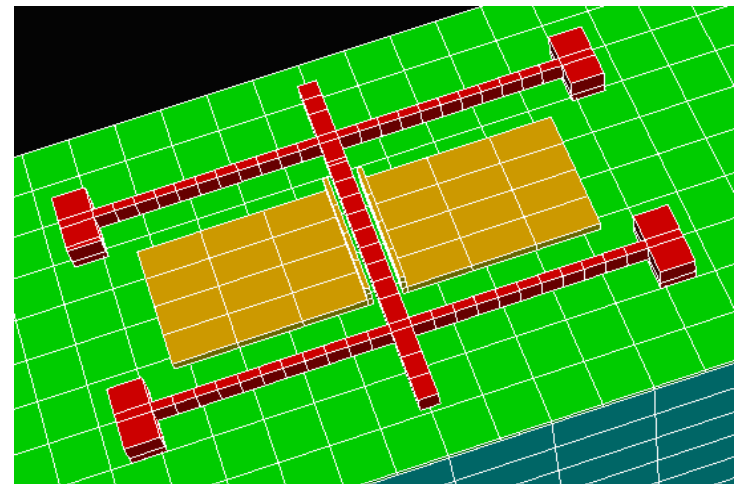
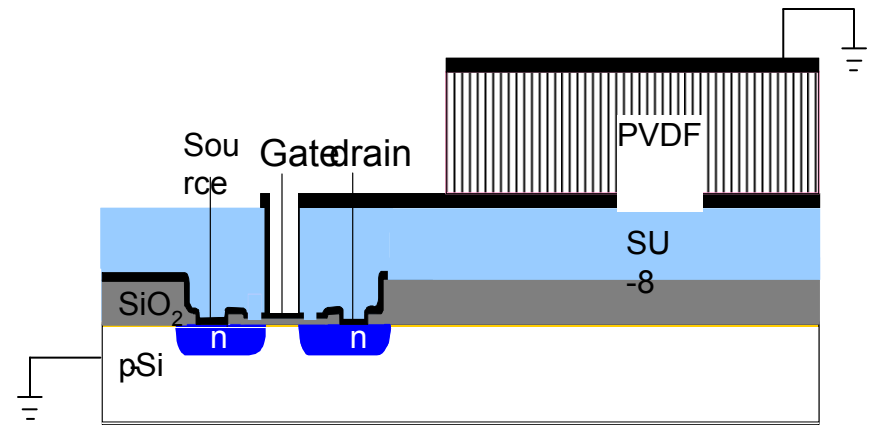
MEMS Design Centre

Focus: Design and Analysis of Micro Sensors and Actuators.

Facilities Available:

- MEMS CAD Tools
 - Coventorware
 - Designer
 - Analyzer
 - Architect
 - Intellisuite
 - MEMSPRO
 - FEMLAB

Total Cost: Rs.40 lakhs



Embedded System Lab

Focus: Real time acquisition and Control application on Application Specific chips

Facilities Available:

- PIC Microcontroller Kits and Add-on cards
- Universal Programmer
- Hi-Tech C CROSS COMPILER FOR MICROCHIP PIC micro – 12/14/16/18
- Hi-Tech C CROSS COMPILER FOR MICROCHIP Intel 8 bit series
- Real Time Kernel for microcontroller and evaluation board for CAN
- ARM7-CORE 32-Bit Micro Controller
- FPGA Development board
- USB based data Acquisition board With VI enabled

Total Cost: Rs.20 lakhs



Research and Development Activities

Total funding so far:Rs. 94.72 Lakhs

On Going Research & Development Projects

1. Design and Development of Micro Devices.

- Co-ordinating Agency: IISc, Bangalore - NPSM.

(National Program on Smart Materials)

- Progress:

Phase 1: May 2005- March 2006

- Facilities Established –MEMS Design CAD Tools
- Micro Devices were designed and Fabricated by POLYMUMS Process.
- Characterization is in progress

On Going Research & Development Projects

Phase2: April 2006 onwards

- Micro Resonators were designed and sent for fabrication by POLYMUMS Process.

- Coordinators : Ms. G.Uma

Dr. M.Umapathy

Dr. K.K.Anilkumar

- Number of UG & PG Students involved: 25

On Going Research & Development Projects

2. Micro Resonating Beam Differential Pressure

Sensor: Simulation and Electronic Interface Design

Funding Agency: ISRO, Bangalore

Grant received: Rs.1.16 Lakhs (2007-08)

3. Uncertainty analysis of chain error in Instrumentation system.

Funding Agency: ISRO, Bangalore

Grant received: Rs.1.36 Lakhs (2007-08)

4. Towards Reliable and Smart Air Vehicles (member)

Funding Agency: UK - India Education &
Research Initiative (UKIERI)

Grant received: UK £ 17,620 (2007-2011)

5. Control of Multivariable process using soft
computing

Funding Agency: DST

Grant received: Rs.9.00 Lakhs (2007-2010)

Research & Development Projects Completed

1. Embedded System Based Mobile Patient Monitoring Device

Funding Agency: MHRD, Govt of India

Grant received: Rs.9 lakhs

2. Design and Development of Embedded System for Rate of Change of Pressure Measurement using IEEE P 1451.4 .

Funding Agency: MHRD, Govt of India

Grant received: Rs.8 lakhs

3. Modeling and Control of Smart Structures Using Multisensor Data Fusion

Funding Agency: MHRD, Govt of India

Grant received: Rs.9 lakhs

Year of Completion: 2006

4. Design and Development of Mechatronics Laboratory Modules

Funding Agency: MHRD, Govt of India

Grant received: Rs.12 lakhs

Year of Completion: 2005

Research & Development Projects Completed

5. Design and development of structural vibration control system using smart materials as sensor / actuator
 - Funding Agency: MHRD, Govt of India
 - Grant received: Rs.12 lakhs
 - Year of Completion: 2004

6. Robust and Efficient Algorithms for Modern Control Systems
 - Funding Agency: DST
 - Grant received: Rs. 2.22 lakhs
 - Year of Completion: 2005

7. TAPTEC - Biomedical Instrumentation
 - Funding Agency: AICTE.
 - Grant received: Rs. 6.5 lakhs
 - Year of Completion: 2000

Institute Industry Interaction

Organization	Work carried out
NPOL, Cochin	Design and analysis of Micro Hydrophone and Vector sensor No. of projects 2 Duration: one year
BHEL, Trichy	Automation using PLC, Sensor integration using TCP/IP No. of projects 2 Duration: one year
BEL, Bangalore	Micro pressure sensor packaging design No. of projects 1 Duration: six months
ISRO, Bangalore	MEMS based RF switch No. of projects 1 Duration: six months

Institute Industry Interaction

Organization	Work carried out
Tata Honeywell, Bangalore	Sensor Fault Detection and Identification No. of projects 1 Duration six months
CVRDE, Chennai	Finite element modeling and control of piezo laminated smart structures No. of projects 2 Duration: one year
FCRI, Palghat	Rate of change of pressure measurement No. of projects 1 Duration: three years
Tata Elxi, Bangalore	Development of Simulator block No. of projects 2 Duration: six months

RESEARCH AREAS

- Vibration control of structures using smart materials
- Design and Analysis of MEMS based Sensor and Actuator
- Mathematical Control Theory and Computational Complexity
- Uncertainty Analysis of Instrumentation Systems
- Instrumentation System Design and Fabrication

RESEARCH AREAS

- Embedded Systems
- Process Control
- Fault Tolerant Systems
- BioMedical Instrumentation.

Research Publications

