




## Research Facilities at Instrumentation and Control Engineering Department




Department of Instrumentation and Control has following laboratories:

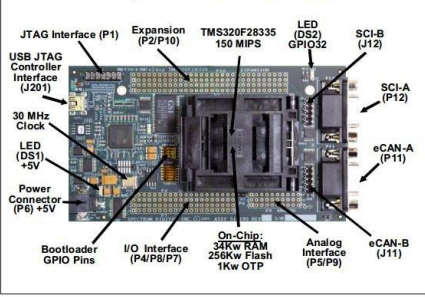

1. Analytical Laboratory
2. Hybrid Electronics Laboratory
3. Advanced Control Laboratory
4. Embedded Laboratory
5. Johnson Control Laboratory
6. PLC Laboratory
7. Pneumatics and Hydraulics Laboratory
8. Advanced Process Laboratory
9. Digital Signal Processing Laboratory
10. Biomedical Laboratory



Research Facilities available at laboratories are as follows:


Analytical Laboratory	Cost (Rs in Lakhs)
	
<ul style="list-style-type: none"> <li>• UV- Visible Spectrophotometer (Chemito UV 2100),</li> <li>• Gas Chromatography (Chemito-GC-7610)</li> <li>• Trace Oxygen Analyzer, Conductivity Meter</li> <li>• Cold Press Hydraulic(KIMAYA Engineering)</li> <li>• Turbidity Meter(LABTRONICS LT 33), Furnace, Spirometer (Clement Clarke international)</li> <li>• 5 &amp; ½ DMM interfaced with PC Trace Oxygen Analyzer</li> </ul>	<p>1.0</p> <p>1.8</p> <p>3.9</p> <p>1.5</p> <p>4.0</p> <p>0.5</p>
<b>Total</b>	<b>12.6</b>


Hybrid Electronics Laboratory	Cost (Rs in Lakhs)
<div style="display: flex; justify-content: space-around;">   </div> <ul style="list-style-type: none"> <li>• Arbitrary waveform Generator</li> <li>• PLD Hardware and Software: Xilinx ISE webpack and Spartan 3 and Virtex 5 FPGA development boards,</li> <li>• Logic Analyzer and Mixed Signal Oscilloscope</li> <li>• Zed Board</li> </ul>	<p>1.5</p> <p>4.0</p> <p>4.0</p> <p>2.5</p>
<b>Total</b>	<b>12</b>



Advanced Control Laboratory	Cost (Rs in Lakhs)
<div style="display: flex; justify-content: space-around;">    </div> <ul style="list-style-type: none"> <li>• Quanser Active suspension, Unmanned ground vehicle</li> <li>• 2 DOF Helicopter system</li> <li>• Magnetic levitation, Quanser QUBE</li> <li>• 2 DOF Flexible Link, Coupled tank systems, Antilock breaking system, 3-D Gyroscope, 2DOF flexible joint</li> <li>• QET DC motor trainer kit, Rotary Servo Base Unit, etc.</li> </ul>	<p>7.0</p> <p>42.0</p> <p>1.0</p>
<b>Total</b>	<b>50</b>


Embedded Laboratory	Cost (Rs in Lakhs)
<div style="display: flex; justify-content: space-around; align-items: center;"> <div data-bbox="227 262 649 588"> <p style="text-align: center;"><b>eZdsp™ F28335 Hardware</b></p>  </div> <div data-bbox="665 378 1120 588">  </div> </div> <ul style="list-style-type: none"> <li>• Video Processing Development Setup</li> <li>• Tektronix Two Channel Digital Storage Oscilloscope</li> <li>• Free Scale FRDM KL eZ Board, LPC 2148 ARM 7 Board, GSM Module SIM 300, ULink 2 Emulator, etc.</li> <li>• Arbitrary Function Generator</li> <li>• 6 &amp; ½ digit multimeter</li> <li>• BLDC control setup</li> </ul>	<p>4.5</p> <p>2.5</p> <p>3</p> <p>1.5</p> <p>1.0</p> <p>7.5</p> <hr/> <p><b>Total</b>      <b>20</b></p>


Johnson Control Laboratory	Cost (Rs in Lakhs)
<div style="display: flex; justify-content: space-around; align-items: center;"> <div data-bbox="227 1134 714 1407">  </div> <div data-bbox="730 1134 1201 1407">  </div> </div> <ul style="list-style-type: none"> <li>• Dedicated Johnson Controller for Building Automation</li> <li>• AHU unit (Air Handling Unit)</li> <li>• Chilled water system unit</li> <li>• Comsol multi-physics software</li> </ul>	<p>32</p> <p>3.5</p> <p>2</p> <p>5</p> <hr/> <p><b>Total</b>      <b>42.5</b></p>

PLC Laboratory	Cost (Rs in Lakhs)
 <ul style="list-style-type: none"> <li>• Control Logix 556003SE Controllers</li> <li>• I/O Cards, Ethernet cards, Control net cards</li> <li>• PLC Simulator</li> <li>• Rockwell Automation Toolkit</li> </ul>	40.0
<b>Total</b>	<b>40.0</b>

Pneumatics and Hydraulics Laboratory	Cost (Rs in Lakhs)
 <ul style="list-style-type: none"> <li>• Festo Pneumatic and Hydraulics Setup and Components</li> <li>• Micro 850 PLC Panel</li> <li>• Remote Trigger Temperature System</li> </ul>	18.0 1.0 6.0
<b>Total</b>	<b>25.0</b>

Advanced Process Laboratory	Cost (Rs in Lakhs)
<div style="display: flex; justify-content: space-around;">   </div> <ul style="list-style-type: none"> <li data-bbox="267 604 1230 703">• Pilot plants such as Boiler &amp; Heat Exchanger, Evaporator, Spray Dryer, Bioreactor, Distillation Column, Batch Process &amp; Bottle Filling, Quadruple Tank System. <span style="float: right;">50</span></li> <li data-bbox="267 709 1230 808">• Flow Measurement Skid, Level Measurement Skid, Temperature Measurement Skid, Pressure &amp; Vacuum Measurement Skid, Torque &amp; Vibrations Measurement Skid, Calibrator <span style="float: right;">20</span></li> <li data-bbox="267 814 1230 846">• Central Control Room <span style="float: right;">10</span></li> </ul>	
<b>Total</b>	<b>80</b>

Digital Signal Processing Laboratory	Cost (Rs in Lakhs)
 <ul style="list-style-type: none"> <li data-bbox="267 1423 1230 1455">• Altium Designer Custom Board</li> <li data-bbox="267 1461 1230 1493">• TI C 6000 and C2000 development boards with IDE <span style="float: right;">0.5</span></li> <li data-bbox="267 1499 1230 1530">• Tektronix Two Channel Digital Storage Oscilloscope <span style="float: right;">1.5</span></li> <li data-bbox="267 1537 1230 1568">• Tektronix function generator <span style="float: right;">2.5</span></li> </ul>	
<b>Total</b>	<b>7</b>

Biomedical Laboratory	Cost (Rs in Lakhs)
 <ul style="list-style-type: none"> <li data-bbox="267 598 1234 672">• Multiparamonitor and , Patient Simulator: Prosim 8 vital signs simulator, Electrical Safety Analyser, Spectrum Analyser</li> <li data-bbox="267 672 1234 850">• NI ELVIS II board with QNET Myoeletric Trainer Kit , EMG Machine (Nihon Kodhen), National Instruments (NI) DAQ – USB, PXI Test and Measurement Set up, Embedded Vision System, Wireless sensor network nodes with gateways, Image Processing and Development System, Electrometer , Motion Control set up, Real Time Measurement and Control set up, etc.</li> <li data-bbox="267 850 1234 913">• Software's – LabVIEW Professional Development Academic License Suite, MATLAB</li> </ul>	<p data-bbox="1372 598 1437 630">20.0</p> <p data-bbox="1372 682 1437 714">60.0</p> <p data-bbox="1372 871 1437 903">20.0</p>
<b>Total</b>	<b>100.0</b>