



**Annexure - XVIII****Department wise equipment details**

<b>Sr. No</b>	<b>Name of Department</b>	<b>Total No. of Labs</b>	<b>Equipment Cost (Rs. in Lakhs)</b>
05	Electronics & Telecommunication Engineering	17	596.8825
<b>Total</b>		<b>17</b>	<b>596.8825</b>

<b>Sr. No.</b>	<b>Name of Laboratory</b>
1	Electronics Laboratory
2	Power Electronics Lab
3	Digital Signal Processing Lab
4	Digital / ICA Lab
5	Communication Lab
6	Test & Measurement Lab
7	Internet Lab
8	Microwave Laboratory/ Audio-Video Lab
9	Fibre Optics Lab
10	P.G.Lab – I
11	P. G. Lab - II
12	Image Analysis Centre
13	Center for Advanced Embedded Computing (Lab I and II)
14	Embedded Systems Laboratory
14	Texas Instruments Centre of Excellence (An extension to an Embedded Systems Laboratory)
15	VLSI Lab
16	Research Lab
17	PCB Lab





## 5 ELECTRONICS & TELECOMMUNICATION DEPARTMENT

1. Electronics laboratory	Cost: 5.16 Lakhs
 <ul style="list-style-type: none"><li>• CROs -(15)</li><li>• Function Generators-(9)</li><li>• Multi- meters,-(6)</li><li>• Experimental Kits,-(40)</li><li>• Power Supplies-(11)</li><li>• Function Generators,- (7)</li></ul>	<b>Usage:</b> Conduction of Electronics and Computer Workshop Practical of FY B.Tech. students
2. Power Electronics Laboratory	Cost:71.44 Lakhs
 <ul style="list-style-type: none"><li>• Power electronics kits, -(24)</li><li>• AC/DC drives, Motors, -(3)</li><li>• Stepper Motor Drive,-(1)</li><li>• Power Scope, CROs, -(10)</li><li>• Power Scope(Lecroy)-(1)</li><li>• Function Generators,-(2)</li><li>• Power Factor meter,-(1)</li><li>• SMPS, UPS, -(1)</li><li>• Digital Tachometers, -(1)</li><li>• Power Supplies -(10)</li><li>• Single Phase SCR fired Dc Drive -(1)</li><li>• SCR Converters and reactive Loads -(1)</li><li>• SCR and AC Phace Control -(1)</li><li>• Three Phase Power Quality Oscilloscope -(1)</li></ul>	<b>Usage:</b> Conducting Third Year B.Tech Lab (Power Electronics Lab)





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<b>3.Digital Signal Processing Laboratory</b>	<b>Cost: 4.20 Lakhs</b>
 <ul style="list-style-type: none"><li>• Dual –Core Processor based Personnel Computers-(15)</li><li>• CODE Composer Studio</li><li>• TMS 320XX DSP Processors</li></ul>	<b>Usage:</b> TY B.Tech Lab (Digital Signal Processing Lab)
<b>4.Digital &amp; ICA Laboratory</b>	<b>Cost: 5.16 Lakhs</b>
 <ul style="list-style-type: none"><li>• Digital Trainer Kits, -(14)</li><li>• 8085 Microprocessor and Peripheral Kits , -(10)</li><li>• CROs, -(9)</li><li>• Function Generators, -(7)</li><li>• Multi- meters, -(8)</li><li>• Power Supplies -(13)</li></ul>	<b>Usage:</b> For conducting EDC and ICA Lab for SY B.Tech students as well as can be utilized for testing Student's Projects (Mini/Micro Project)





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<b>5. Communication Laboratory.</b>	<b>Cost: 63.252 Lakhs</b>
 <ul style="list-style-type: none"><li>• Analog and digital communication kits,(15)</li><li>• Digital Storage Oscilloscope, (12)</li><li>• Distortion and level meters,-(1)</li><li>• Intel core-i7 @ 3.4 GHz Personnel Computers -(07)</li><li>• Microwave Integrated Circuit Analyser -(1)</li><li>• SDR and reciever, 3G Communbication System</li><li>• Wireless Digital Radio Transmitter-SDR &amp; Receiver</li><li>• Understanding of 3G Communication system</li><li>• Digital Communication Training System.</li><li>• AMITEC Make C&amp;S Band Satellite</li></ul>	<b>Usage:</b> Lab is used for TY B.Tech students for conducting practicals of Digital Communication System.
<b>6. Test &amp; Measurement Laboratory</b>	<b>Cost: 234.27 Lakhs</b>
 <ul style="list-style-type: none"><li>• Mixed Signal Oscilloscope,</li><li>• Digital Phosphorus Oscilloscope,</li><li>• Logic Analyzer,</li><li>• Network Analyzer</li><li>• Spectrum Analyzer,</li><li>• Arbitrary Waveform Generator,</li><li>• Field Strength Meter,</li><li>• LCR -Q Meter</li><li>• Synthesized signal Generator</li><li>• 100/200 MHz Cathode Ray Oscilloscope</li><li>• Vector Network Analyzer</li><li>• EMI Test Receiver</li><li>• Advance Spectrum Analyzer</li><li>• Vector signal Generator</li></ul>	<b>Usage:</b> Lab is used for Final year students and can also be used for providing testing facilities.





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7. Internet Laboratory	Cost: 13.44 Lakhs
 <ul style="list-style-type: none"><li>• Intel core-i7 @ 3.4 GHz Personnel Computers (40)</li></ul>	<p><b>Usage:</b> Lab is used for Final year students for computer network subject. Also, students utilize these computers for completing their laboratory assignments, browsing the Internet to carry out literature survey, online training programs etc.</p>
8.Microwave Labarotary/ Audio-Video Laboratory	Cost:14.80 Lakhs
 <ul style="list-style-type: none"><li>• Microwave Bench, -(1)</li><li>• Microwave Power Meter, -(1)</li><li>• Microwave Oven ,-(1)</li><li>• Antenna simulation software PCAAD</li><li>• Colour TV Trainer Kits -(2)</li><li>• TV CD Display</li><li>• Display for Wobbulator</li><li>• VCD Player Trainer kit -(2)</li><li>• Colour pattern generator</li></ul>	<p><b>Usage:</b> Lab is used for Final year students to cover Microwave and Optical Communication and Audio- Video subjects.</p>





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9.Fiber Optics Laboratory	Cost: 45.07 Lakhs
 <ul style="list-style-type: none"> <li>• Optical Spectrum Analyzer,</li> <li>• OTDR,</li> <li>• FOC experimental kits,</li> <li>• Dual –Core Processor based Personnel Computers(10)</li> <li>• Laser Fiber Optic Trainer, source, Power supply –(1)</li> <li>• Advanced Fiber Optic Trainer</li> <li>• Benchmark Optical Fiber System-IV, Communication Trainer Kit</li> <li>• WDM-Trainer kit</li> <li>• OTDR Trainer Kit</li> <li>• Optisim-4.0 Simulation Software</li> </ul>	<p><b>Usage:</b> Lab is used for Final year students to cover Microwave and Optical Communication subject.</p>

10.Post Graduate Laboratory -I	Cost: 13 Lakhs
 <ul style="list-style-type: none"> <li>• Personnel Computers-(40) <ul style="list-style-type: none"> <li>○ Intel Core I7 3.6 MHz, 8 MB Cache, 4 Cores</li> <li>○ 6 GB DDR3 RAM</li> <li>○ 500 GN SATA HDD</li> <li>○ Intel on board Graphics HD</li> <li>○ Gigabit Network Interface 18.5 "" Widescreen flat panel monitor</li> </ul> </li> </ul>	<p><b>Usage:</b> First year PG students of all specializations (approx. 72) utilize these computers for completing their laboratory assignments, browsing the Internet to carry out literature survey, online training programs etc. These computers are also utilized for conduction of FDPs that includes hands-on sessions.</p>
<p><b>Any additional Information:</b> This laboratory is open and accessible to the students after office hours too (up to 8:00 pm).</p>	





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<b>11.Post Graduate Laboratory -II</b>	<b>Cost: 8.50 Lakhs</b>
 <ul style="list-style-type: none"><li>• Dual –Core Processor based Personnel Computers-(11)</li><li>• Intel P-IV 3 GHz Personnel Computers –(13)</li></ul>	<b>Usage:</b> Second year PG students of all specializations (approx. 72) utilize these computers for completing their laboratory assignments, browsing the Internet to carry out literature survey, online training programs etc.
<b>12.Image Analysis Center</b>	<b>Cost:22.57 Lakhs</b>
 <ul style="list-style-type: none"><li>• Phantom V311 high speed camera</li><li>• DM 100 Leica Microscope</li></ul>	<b>Usage:</b> Camera: High speed video capture Microscope : For biological and thin surface metalurgical applications



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<b>13 Center for Advanced Embedded Computing</b>		<b>Cost: 3.465 Lakhs</b>
		<b>Usage:</b> Hardware platforms available in the laboratory is extensively used to carry out U.G practicals of Digital Electronics and Microcontroller.
<b>Lab I</b>		
<ul style="list-style-type: none"> <li>• Dual –Core Processor based Personnel Computers-(11)</li> <li>• Stellaris Guru Microcontroller Evaluation Kits v 1.0 based on ARM Corex - M3 LM3S608 (05): Donated by Texas Instruments</li> </ul>		
<b>Lab II</b>		
<ul style="list-style-type: none"> <li>• Dual –Core Processor based Personnel Computers-(11)</li> <li>• Intel Atom Innovation Kits based on E6xx processor (02) : Donated by Intel</li> </ul>		

<b>14. Embedded Systems Laboratory</b>		<b>Cost:21.885 Lakhs</b>
		<b>Usage:</b> Hardware platforms available in the laboratory is extensively used to carry out U.G and P.G. course practicals.
<ul style="list-style-type: none"> <li>• 8051 Family Development Tools and Libraries,</li> <li>• Mini Cards with 8051 based</li> <li>• Microcontrollers from Phillips, Analog Devices, Dallas</li> <li>• Analog I/O cards, Digital I/O cards,</li> <li>• Alpha-numeric and Graphics,LCD, Keyboard Matrix</li> <li>• Ethernet interface cards</li> <li>• PIC development system with 16F877 microcontroller and peripherals</li> <li>• PIC programmer</li> <li>• PC based Data acquisition system</li> <li>• ARM processor Kit and development tool set</li> <li>• Academic License of <math>\mu</math>-COS(5)</li> <li>• Intel P-IV 2.4 GHz Personnel Computers -(08)</li> <li>• Qualnet Research Licence</li> <li>• HP Z2400 Workstation</li> <li>• Metagraphics software and development boards</li> <li>• DM 6446 ( Da Vinche+ARM) Processor Development Board</li> </ul>		
<b>14 a. Texas Instruments Centre of Excellence (An extension to Embedded Systems Laboratory)</b>		<b>Cost: @ 5 Lakhs</b>





- MSP-EXP432P401R,
- LAUNCHXL-CC1310,
- BOOSTXL-EDUMKII,
- PLMK BOOST,
- BOOSTXL-SENSHUB,
- TI-RSLK

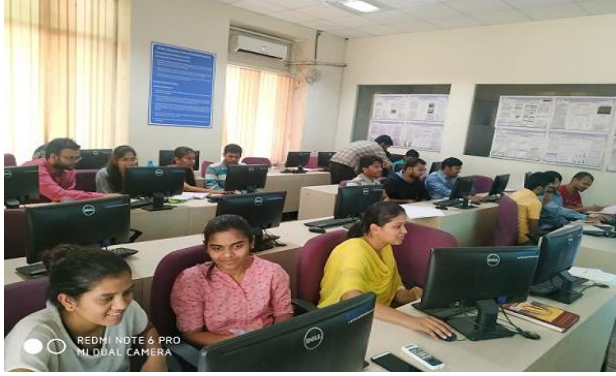
**Usage:**

Texas Instruments Platforms are utilized for Mini and Major Projects by U.G. students.


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15.VLSI Laboratory	Cost:43.01 Lakhs
 <ul style="list-style-type: none"><li>• Xilinx 14.2 Software, ModelSim Software</li><li>• DSP Application Software</li><li>• FPGA Trainer, CPLD Trainer</li><li>• Universal Trainer Kit For CPLD-FPGA Devices</li><li>• Device Adapter</li><li>• PCI Interface Cards</li><li>• Embedded System Development Software Kit</li><li>• FPGA based Development Board – (2)</li><li>• Microwind Package 3.1</li><li>• Mentor Graphics Simulation Tool for VHDL</li><li>• Cadence Tool for Analog/Digital System Design</li><li>• Metor Graphics h Higher Education 2 (HEP-2) for Front end design (25 USER)</li><li>• Zynq-7000 Development Board</li><li>• Zed Development Board – (4)</li><li>• Virtex-5 Development Board</li><li>• Kintex-7 Development Board kit</li><li>• Tensilica Xtensa Xplorer(XPG)</li></ul>	<p><b>Usage:</b> The various FPGA / SoC kits are utilized by Second year, third year and Final year B.Tech and M.Tech First and Second year for lab practical as well as mini and major projects. For Digital and Analog CMOS Circuit Designs and Verification, CAD tools like Cadence and Mentor Graphics are used by UG and PG students. Tensilica Xtensa Xplorer is used for Customizable Processor Designs by some M.Tech students for their project work.</p>



16. Research Laboratory	Cost: 20 Lakhs
	
<p><b>1. NETSIM-Standard(Research) Version 10.0, upgraded to 11.1</b></p> <p><b>Following components with 5 user licenses and Protocol Primitives C Source Code Library for:</b></p> <ul style="list-style-type: none"> <li>• <b>Inter-Networks:</b> Ethernet - Fast &amp; Gigabit, ARP WLAN - 802.11 a, b, g, n, ac and e Propagation - Free space, Log-normal, Rayleigh IP v4, Firewalls Routing - RIP, OSPF Queuing, External Interface Wireshark and MATLAB interfaces</li> <li>• <b>Border Gateway Protocol (BGP):</b></li> <li>• <b>Advanced Wireless Networks:</b> Wi-Max, MANET - DSR, AODV, OLSR, ZRP</li> <li>• <b>Internet of Things:</b> WSN, ZigBee</li> <li>• <b>Cognitive Radio Networks:</b> IEEE 802.22 WRAN</li> <li>• <b>Long Term Evolution (LTE) Networks:</b> LTE (4G), LTE Advanced (4.5G), LTE Device to Device, <b>Emulator: 1 user</b></li> </ul> <p><b>2. Precision 5820 Tower Workstation:</b></p> <p>Quadro® RTX graphics. Runs any software as fast as possible and get real-time results due to this memory expandable machine with up to 512GB of 2666MHz RDIMM ECC memory.</p> <p><b>Samsung Xpress SL-M2876ND: Printer</b></p>	<p><b>Usage:</b></p> <p>NetSim is a full stack, end to end, packet level, discrete event simulator which focuses on steady state performance of the networks. It allows to perform capacity analysis, eg. RSSI, SNR etc based on the requirement. In addition to the grid background on top of which the network is designed, map background can be set for which NetSim imports maps from OpenStreetMaps (OSM).</p> <p><b>Usage:</b> Precision 5820 Tower is useful for complex projects, including virtual reality and AI workflows, with highest-performing NVIDIA® Multi-Function Laser Printer Compact Size, saves space, both for A4 and Legal Printing, with automatic feeder</p>



17. PCB Laboratory	Cost:18 Lakhs
 <p data-bbox="331 768 766 801">EP-42 Auto PCB Prototype Machine</p>	 <p data-bbox="1027 674 1246 707">Chemical set-up</p>
<ul style="list-style-type: none"> <li>• Automatic PCB &amp; Antenna Prototype Machine: EP-42 Auto PCB Prototype Machine</li> <li>• PCB artwork film maker (Photo Contact Printer)</li> <li>• Artwork table</li> <li>• PCB shearing machine</li> <li>• Photo-resist Dip coating machine</li> <li>• Both side UV exposure unit</li> <li>• Dye &amp; development tank</li> <li>• Roller Tinning Machine</li> <li>• Drilling Machine</li> <li>• PCB curing machine</li> <li>• Etching Machine</li> <li>• Rework Station</li> <li>• Automatic PCB &amp; Antenna Prototype Machine: EP-42 Auto PCB Prototype Machine</li> <li>• PCB design software: TINA V11 Design Suite Educational Version</li> <li>• Complete PTH Setup with full Necessary Accessories</li> </ul>	<p data-bbox="1203 981 1437 1285"><b>Usage:</b> The various machines in the lab are utilized by Second year, third year and Final year B. Tech and M. Tech First and Second year students for mini and major projects.</p>