

# 1. Communication Lab

## Communication Modulation & Demodulation kits

### Amplitude Modulation & Demodulation kits Sciencetech-2201 & Sciencetech-2202

Amplitude Modulation Kits: A self-contained TechBook, Functional blocks with self-explanatory waveforms and technical details indicated on board, Oscillator controlled carrier frequency, LED indication for signal flow and selection.

Amplitude Demodulation kits: On board Tuner provided for tuning the transmitting station, LED indication for signal flow and selection.

### Frequency Modulation & Demodulation kits Sciencetech-2203

A self-contained TechBook, Functional blocks with self-explanatory waveforms and technical details indicated on board.

### Pulse Code Modulation & Demodulation kits Sciencetech-2802

Modulator and Demodulator on same board, On-board DDS Signal Generator for standard and Arbitrary signals.

### Delta Modulation & Demodulation kits Sciencetech-2155

Transmitter and Receiver on same board, Clock generation from crystal, Switch selectable sampling rates.

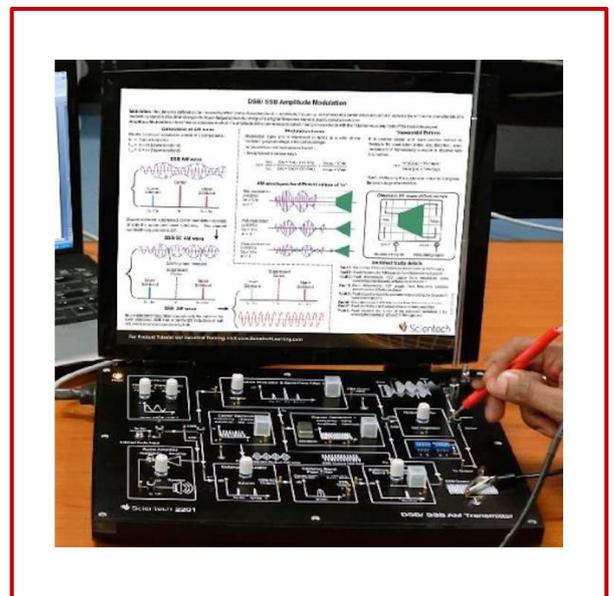
### ASK, FSK, PSK Modulation & Demodulation kits Sciencetech-2807

Personalized Learning platform, On-board Data Generator with various data patterns, Selectable data frequencies.

Quantity: 10 number each

Date of Purchase: 31/12/2019

Total Price: ₹6,60,475



## Oscilloscopes

### 30 MHz Analog Oscilloscopes.

Model: Scientech 801

30 MHz Bandwidth • X10 Magnification • 20 ns max sweep speed • Stable Triggering upto 40 MHz

• Alternate Triggering

Quantity: 05

Date of Purchase: 31/12/2019

### Digital Storage Oscilloscopes

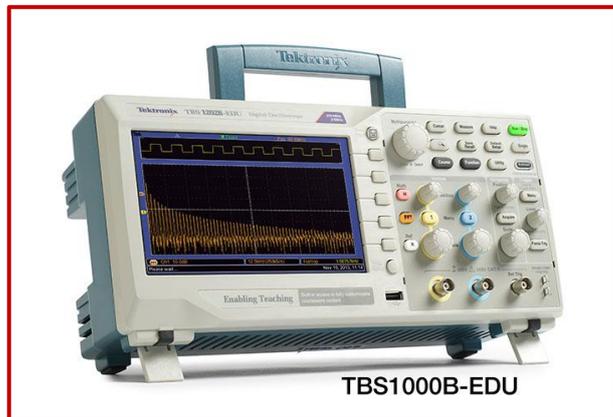
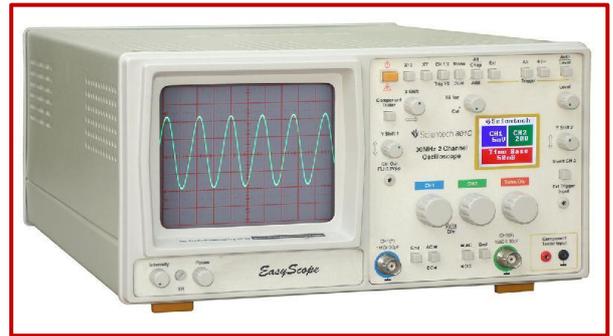
Techtronix 50 MHz

Offers a distinctive range of capabilities in an oscilloscope with controls and menus that are familiar and easy to use.

Quantity: 09

Date of Purchase: 05/06/2013

Total Price: ₹5,90,750



## 2. Analog Electronics Lab

### Oscilloscopes

#### Digital Storage Oscilloscopes

Techtronix 50 MHz

Quantity: 6 Nos

Date of Purchase:  
05/06/2013

#### Digital storage Oscilloscopes

RIGOL DS1052E 1 Gsps

Low cost 2 channel oscilloscope with 50 MHz bandwidth, 1 GSa/s and 1 Mpts memory and 14.5 cm TFT LCD display (320×234 pixel).

Quantity: 4 Nos

Date of Purchase:  
09/07/2015

#### Analog Oscilloscopes

S48410 Scientific 30 MHz

Dual Channel, four trace x1-x10 simultaneously.

Bandwidth DC to 30 MHz.

Quantity: 10 Nos

Date of Purchase:  
09/07/2015

**Total Price: ₹5,19,961**



### Multimeters

#### Digital 6.5 Digit Multimeter

Keysight 34401A

Histogram, bar and trend charts on 4.3-inch color graphical display ease monitoring and speed up statistical analysis.

Quantity: 22 Nos

Date of Purchase:  
20/01/2014 & 13/01/2017

**Total Price: ₹12,01,685**



### 3. Computational Lab

#### Computers

Microsoft Windows

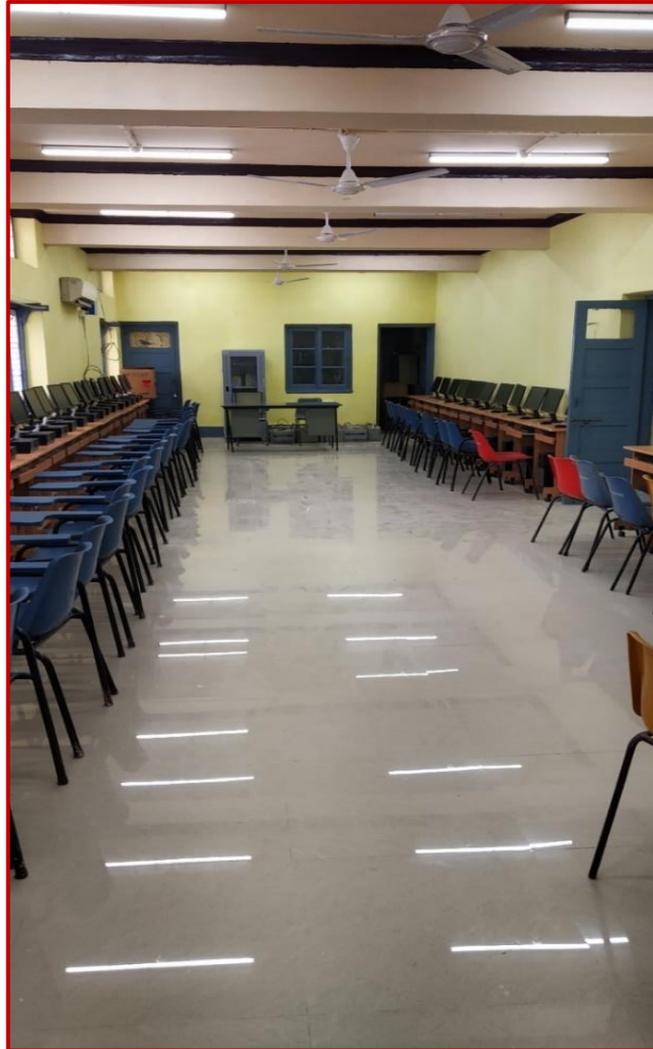
Quantity:17 Nos

Linux

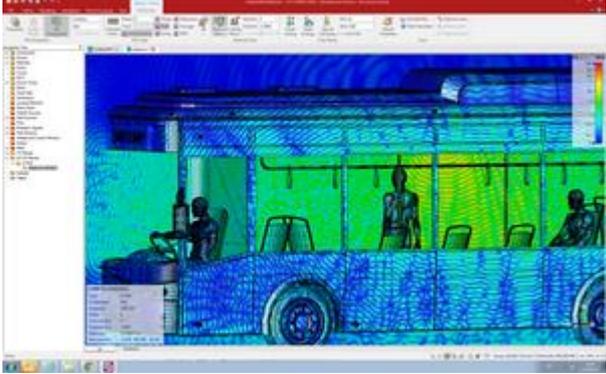
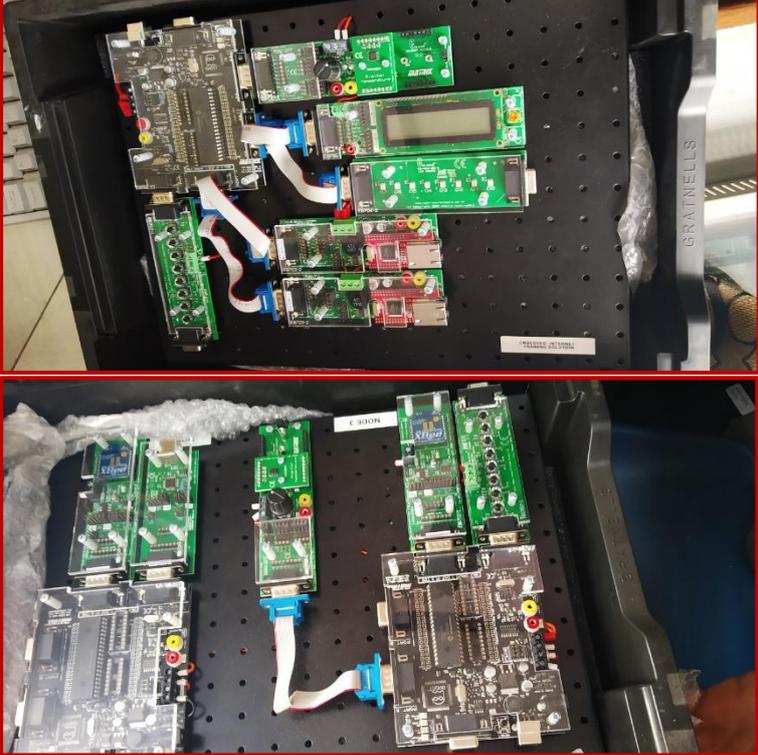
Quantity:30 Nos

Model Brand DELL Series  
OptiPlex 9020 Modeld09u' Quick  
Info>TypeBusiness Desktops &  
Workstations Form Factor Micro  
Tower Usage Business Processor  
Intel Core i5-4590T 2.0 GHz  
Processor Main Features64 bit  
Dual Core Processor Cache Per  
Processor6 MB L3 Cache  
Memory8 GB DDR3 1600  
Storage500GB Graphics Intel HD  
Graphics 4600 Ethernet Gigabit  
Ethernet Power Supply65W  
Operating System Windows 7  
Professional 64-Bit free upgrade to  
8 professional Motherboard  
Chipset Intel Q87CPU CPU Type  
Intel Core i5 CPU Speed4590T  
(2.0 GHz) L3 Cache Per CPU6 MB  
CPU Main Features64 bit Quad-  
Core Processor Graphics  
GPU/VGA Type Intel HD  
Graphics 4600 Graphics Interface  
Integrated video Memory Memory  
Capacity8 GB DDR3 Memory.

Total Price: ₹22,97,092



## 4. Embedded System Lab

	<p><b>Simulation Software</b></p> <p>CST Studio Suite.</p> <p>CST Studio Suite® is a high-performance 3D EM analysis software package for designing, analysing and optimizing electromagnetic (EM) components and systems.</p> <p>Quantity: 01 Nos</p> <p><b>Total Price: ₹3,77,600</b></p>
	<p><b>Embedded Design and Testing</b></p> <p>Flow code ultimate simulator Quantity: 01 Nos</p> <p>Training Solution Mobile ZigBee Quantity: 01 Nos</p> <p><b>E-blocks2 PIC multiprogrammer BL0080</b> The 8-bit microcontroller multi-programmer connects to a PC via USB to provide you with a powerful microcontroller and debugging platform.</p> <p><b>Total Price: ₹14,43,231</b></p>

## 5. Machine Learning Lab



### Workstations

ASUS hybrid Workstations. (Programmable). Intel® Core™ i7 Processor/7700.

ASUS ROG G20CI-DS71-GTX1080 Compact Gaming Desktop GTX 1080 8GB Intel Core i7-7700 512GB SSD + 1TB HDD 16GB DDR4. Front Panel: 1x Headphone; 1x Microphone; 2x USB3.1 Gen 1. Back Panel: 1x S/PDIF-Out; 1x RJ45 LAN; 2x DC Power Jack; 4x USB3.1 Gen 1; 1x USB3.1 Gen 2 (Type C); 2x USB3.1 Gen 2 (Type A).

Quantity: 06 Nos

Date of Purchase: 05/04/2018

**Total Price: ₹13,50,000**

## 6. Biometric Lab



### Workstations

Dell intel Xeon E5-1650 6 core 3.6 GHz 64 Gb RAM, 15 MB L3 Cache.

The Intel Xeon® E5-1650 v3 3.5 GHz Six Core Processor enhances the performance and the speed of your system. Additionally, the Virtualization Technology enables migration of more environments. It supports enhanced SpeedStep® technology that allows tradeoffs to be made between performance and power consumption.

Quantity: 04 Nos

Date of Purchase: 05/11/2019

**Total Price: ₹7,67,552**



### IRIS Dual Scanner

Quantity: 02 Nos

Date of Purchase: 20/05/2019

**Total Price: ₹36,600**

## 7. Thin Film Lab



### Magnetron Sputtering System

DC/RF Sputtering System with vacuum soldering unit.

SS 304 Vacuum chamber (400 mm (W) X 400 mm (D) X 500 mm (Ht)) Magnetron source: 03 Nos. of HHV make of 2" size DC Power supply: 2400 W DC Air cooled RF Power supply: M/s SEREN USA MAKE of 300 watts with auto matching network Mass flow controllers-2 Nos.

Applications: Preparation of Metal, Semiconductor, Ceramic nanostructured thin films, Nanocomposites and Nanomultilayers, Deposit thin films of various materials in integrated circuit processing, Semiconducting industry, metallisation, barrier layers, display circuitry, discrete components.

Quantity 01

Date of Purchase 25/07/2017

Cost ₹24,04,500



### Vacuum Coating Machine

Vacuum Coating BC 300 with beam evaporation

Flash Evaporation Assembly

Multifilament turret.

8 KW Electron Beam Gun 270 bent beam with 4 source or Single source capacity,

6 KW power supply,

Planetary drive,

Digital Thickness Monitor

Quantity 01

Date of Purchase 05/10/2015

Cost ₹22,59,085

	<p><b>PCB Prototyping Machine</b></p> <p>Auto tool changer 49 Pcs  Software Copper CAM and Mach3 Mill  Resolution (X/Y) 3.125 Micro Meter (0.123 Mil)  Conversion Software Converts Gerber, G code  Capability of Processing various materials FR4, Copper clad, Acrylic, Metal, Aluminium and etc.,  Max Travel Speed (mm/sec) 58 (2.28 “)</p> <p>Quantity 01</p> <p>Date of purchase 09/07/2019</p> <p><b>Cost ₹10,20,000</b></p>
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### 8. Information Security Lab (ISEA-III)

	<p><b>Workstations</b></p> <p>Dell Precision 5820 Tower CPU  Base Intel Xeon E5-1650 6 Core 3.6 GHz 15 MB L3 Cache,  64 GB RAM, 1TB HDD</p> <p>Quantity 05</p> <p>Date of purchase 05/11/2019</p> <p><b>Price ₹9,59,495</b></p>
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## 9. Advanced Communication Lab

	<p><b>USRP Software Defined Radio Device</b> <b>National Instruments USRP-2932</b> 20 MHz Bandwidth, 400 MHz to 4.4 GHz, Included GPS-Disciplined OCXO, USRP Software Defined Radio Device</p> <p>Date of Purchase 23-09-2015 Cost <b>Rs:18,10,300</b></p>
<p><b>Matlab software with following accessories tool box (Latest version)</b></p> <ol style="list-style-type: none"><li>1. Matlab (Core)</li><li>2. Simulink (Core)</li><li>3. Communication system tool box</li><li>4. DSP tool box</li><li>5. Optimization tool box</li><li>6. Signal processing tool box</li><li>7.</li></ol> <p>No. of Users 01 Date of Purchase 18-11-2015 Cost <b>Rs:1,32,827</b></p>	
	<p><b>Advance Design System (With 5 years user license)</b> ADS software standard with 5 years upgraded support. ADS media CD</p> <p>License: 5 years No. of Users 01 Date of purchase 19-01-2017 Cost <b>Rs:15,00,000</b></p>

## 10. Microwave Lab



### **Klystron based Micro wave test bench (The scientific instruments co. Ltd.)**

X-band micro wave test bench  
Frequency range (8.2 to 12.4 GHz)  
Klystron power supply  
Model: SKPS-610D  
VSWR Meter  
Model: SW115-D  
Quantity 4  
Date of Purchase 20-05-2019



### **GUNN based Micro wave test bench (The scientific instruments co. Ltd.)**

Ka-band microwave test bench  
Frequency range (26 to 40 GHz)  
GUNN Power Supply  
Model: GS-610  
VSWR Meter  
Model: SW115-D  
Quantity 4  
Date of Purchase 20-05-2019

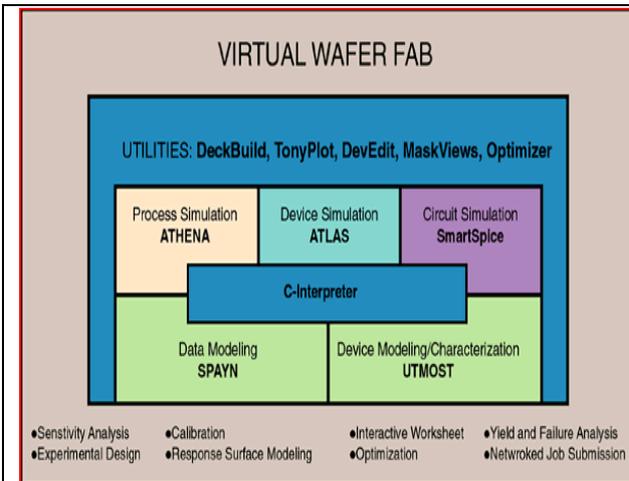
Total cost **Rs 9,57,884.4**

### **Associated Components**

Wave guides  
Wave guide stand  
BNC cable Cooling fan with stand  
Matched termination  
Tunable probe  
Movable short  
Detector mount  
Isolator  
Variable Attenuator  
Frequency meter  
TNC cable  
S.S.Tuner PIN modulator



## 11. Device Simulation Lab



### Silvaco TCAD OMNI Complete Bundle

**Athena Process Framework**, SSUMPREM4, MC IMPLAT, OPTOLITH,

**Device Modules**, ATLAS 2D/3D framework, S-Pisces, Blaze, MC, Mixed Mode, Ferro, Deck Build, Mask Views.

Quantity 01 Floating License

Date of Purchase 25/05/2015

**Cost ₹14,77,000**

### Lumerical Device Simulator

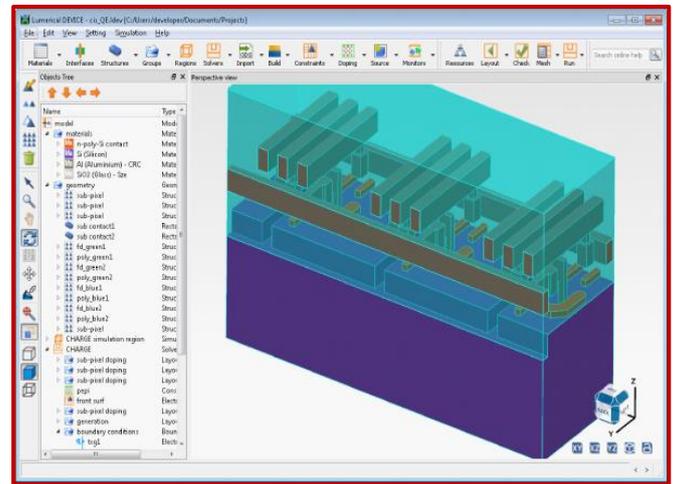
FDTD, MODE, INTERCONNECT, LASER and DEVICE with heat and charge transport solvers.

Complete Academic Lab Suite

Quantity 01 Floating License

Date of Purchase 02/05/2019

**Cost ₹ 14,24,0459**



## 12. Device Characterization Lab

 A photograph of the Ecopia Probe Station Series (EPS 300) setup. It features a microscope mounted on a probe station, used for precise electrical measurements on small semiconductor devices. The setup is on a dark surface with various cables and components visible.	<p><b>Ecopia Probe Station Series (EPS 300)</b></p> <p>Hall effect measurement system. Rapid thermal processor. Semiconductor Measurement Instrument.</p> <p>Quantity 01</p> <p><b>Cost ₹15 lakh</b></p>
<p><b>Arbitrary Function Generator (Tektronix 3021B)</b></p> <p>With 20 MHz bandwidth, 14-bit resolution, and 250 MS/s sample rate. 1 <math>\mu</math>Hz to 20 MHz frequency range 250 MS/s sample rate and <math>\pm 1</math>ppm time base 14-bit vertical resolution</p> <p>Quantity 01</p> <p><b>Cost ₹3.7 lakh</b></p>	 A photograph of the Tektronix AFG 3021B Arbitrary Function Generator. It is a rack-mountable device with a color LCD screen on the left and a control panel with numerous buttons and a large rotary knob on the right. The model number '3021B' is visible on the top left of the front panel.
<p><b>Precision Component Analyzer (6440 B)</b></p> <p>Wide frequency range of 20 Hz to 3 MHz. Fast measurement speed - up to 20 measurements per sec. 0.1% basic accuracy. Up to 125 A of DC bias current. Telecom measurement functions. Straightforward intuitive operation. Print test results. GPIB control with LabVIEW™ driver</p> <p>Quantity 01</p> <p><b>Cost ₹10.4 lakh</b></p>	 A photograph of the Wayne Kerr Precision Component Analyzer 6440B. It is a rack-mountable instrument with a dark screen on the left and a control panel on the right featuring several buttons and a large rotary knob. The model number '6440B' is prominently displayed on the right side of the front panel.

### 13. Optical Fiber Communication Lab

#### Software: Opti-System version 13

Opti-System enables users to plan, test, and simulate (in both the time and frequency domain):

Optical network designs including OTDM, SONET/ SDH rings, CWDM, DWDM, PON, Cable, OCDMA

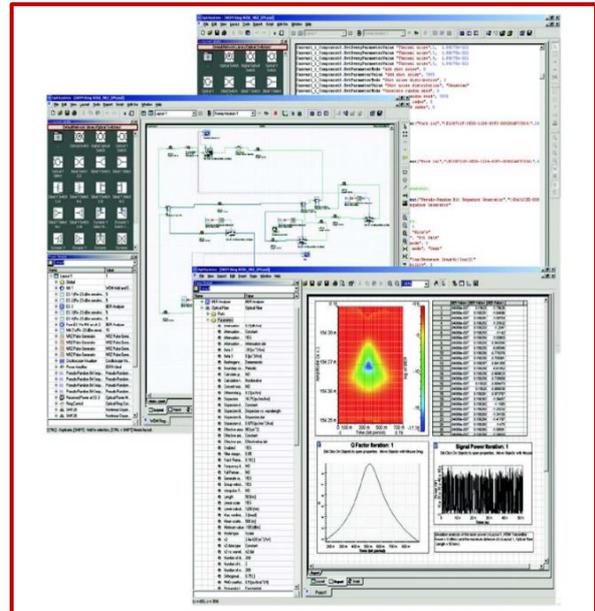
Single-mode/multi-mode transmission  
Free space optics (FSO), Radio over fibre (ROF), OFDM (direct, coherent)

Modulation formats (RZ, NRZ, CSRZ, DB, DPSK, QPSK, DP-QPSK, PM-QPSK, QAM-16, QAM-64).

System performance analysis (Eye Diagram/ Q-factor/BER, Signal power/OSNR, Polarization states, Constellation diagrams, Linear and non-linear penalties)

Quantity 05

Cost ₹11.5 Lakh



#### FOL-MOEDS (Mode Observation Trainer)

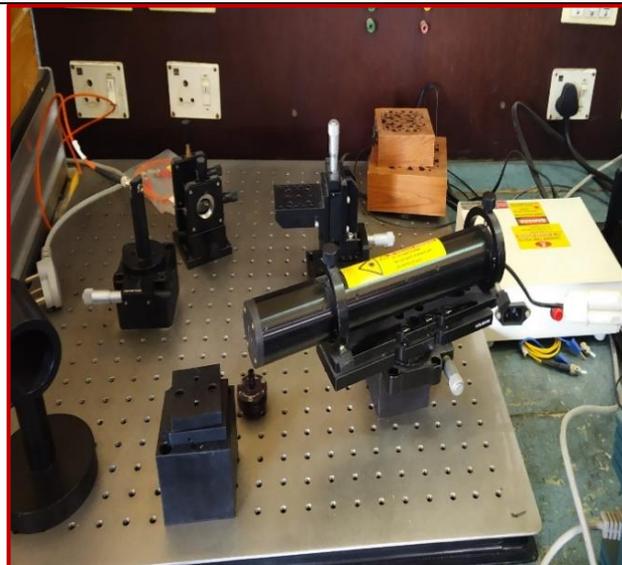
Includes two helium neon LASER 2mW output.

Model observation trainee  
Advance Fibre optic system  
Fibre optic power meter  
Fibre optic light source

Quantity 01

Date of purchase: 11/08/2017

Cost ₹ 7,95,635



## 14. Supporting Facilities

### Uninterrupted Power Supplies

**Eaton-93E 20 KVA 120 min Backup** (Thin Film Lab)

Double-conversion online UPS

Output voltage regulation:

$\pm 1\%$  Static;  $\pm 5\%$  dynamic at 100% resistive load change,  $< 20$  ms response time

Quantity: 01

**Cost: ₹6,15,641**

**Orion Online with isolation transformer 10KVA with battery bank** (Analog Electronics Lab, Computational Lab & Communication Lab)

Power management from SNMP manager and web browser

Quantity: 03

Date of Purchase: 13/01/2014

**Cost: ₹6,00,000**

