# Annamacharya Institute of Technology & Sciences, Tirupati

## 3.1.1. List of Research Equipments with Purpose

| S.No | Name of Research Equipment | Purpose |
|------|----------------------------|---------|
| 1 | Ultrasonic Pulse Velocity Test | Ultrasonic pulse velocity (UPV) test is a nondestructive popular test used to examine the homogeneity, quality, cracks, cavities, and defects in concrete |
| 2 | Rebound Hammer Test | To measure the elastic properties or strength of concrete or rock, mainly surface hardness and penetration resistance |
| 3 | Rapid Chloride Permeability Test | To determine the resistance to penetration of chloride ions |
| 4 | Transmission line model | To determine the symmetrical and unsymmetrical fault currents |
| 5 | Over/Under Voltage Relay | To protect power system from over voltages or under voltages. |
| 6 | Electro Mechanical type IDMT over voltage relay | The IDMT relay has an auxiliary unit which is powered by a secondary winding on the electromagnet through a rectifier and as such a separate auxiliary supply is not required. |
| 7 | Percentage Biased Differential Relay | It measures the phase current from each winding of transformer and calculates differential current and restraining current per phase. |
| 8 | High-End Laptop with Processor: Intel® Core™ i5, 7 th Gen,7200U Processor Memory: 16GB DDR4 RAM Storage : 1TB SATA HDD Graphics: Intel® HD 2GB Graphics 620 . VGA & HDMI with HDCP 2.2ports Display : 15.6" HD 1366x768 resolution Acer ComfyView™ Networking : 802.11ac, Acer Nplify™, 2x2 MIMO WiFi, Gigabit Ethernet (WOL) & Bluetooth 4.0 | For Designing and analysis of automotive and aerospace applications. |
| 9 | Xilinx 9.2 | The Xilinx ISE is primarily used for circuit synthesis and design, while ISIM or the ModelSim logic simulator is used for system-level testing. |

| 10 | TIVA C- Series Launch Pad EKTM4C123GX | Tiva™ C Series Microcontrollers are the first ARM Cortex™-M4 MCUs to be implemented floating-point core and high-performance analog-to-digital converters while still providing low-power modes that consume as little 1.6µA. With up to 40 PWM outputs, a generous number of serial communication peripherals, USB OTG, and two CAN controllers, the Tiva C Series provides an excellent baseline for home, building, and industrial applications. |
|----|----|----|
| 11 | RaspberryPi | Raspberry Pi boards are hugely popular single-board computers (SBCs) that are well suited to DIY IOT devices due to their small size and exhaustive capabilities. There are many different models of Raspberry Pi boards, with different combinations of ports and sensors. |
| 12 | Arduino UNO processors | The Arduino UNO includes 6 analog pin inputs, 14 digital pins, a USB connector, a power jack, and an ICSP (In-Circuit Serial Programming) header. It is programmed based on IDE, which stands for Integrated Development Environment. It can run on both online and offline platforms. |
| 13 | Node MCU Processors | Node MCU has 128 KB RAM and 4MB of Flash memory to store data and programs. Its high processing power with in-built Wi-Fi / Bluetooth and Deep Sleep Operating features make it ideal for IOT projects. |
| 14 | MATLAB 8.2 | Streaming Signal Processing in MATLAB. DSP System Toolbox provides a framework for processing streaming signals in MATLAB. The system toolbox includes a library of signal processing algorithms optimized for processing streaming signals such as single-rate and Multirate filters, adaptive filtering, and FFTs. |
| 15 | DSP Trainer Kits | Digital Signal Processors (DSP) take real-world signals like voice, audio, video, temperature, pressure, or position that has been digitized and then mathematically manipulates them. A DSP is designed for performing mathematical functions like "add", "subtract", "multiply" and "divide" very quickly. |
| 16 | Code Composer Studio Software | Code Composer Studio™ (CCS) is Texas Instruments' Integrated Development Environment (IDE) used to build, debug, and run DSP applications and other processor applications. Contents. |
| 17 | FPV Quadcopter Drone 2.0 MP, WiFi, 720p, 120 degree wide angle camera | Drone photography allows images and audio/video content to be captured that might not be otherwise possible. The capacity of FPV |

| | | drones to enter environments that are unsafe for humans makes them effective for search and rescue missions. |
|---|---|---|
| 18 | 1080p FPV Insight 5G 100mW HDMI Wireless Video Transmitter | Digital Video Transmitter is a customized wireless video transmission product which designed for the aerial photography need of drones. |
| 19 | Sensors | Drones utilize air pressure sensors to stabilize altitude, allowing hover capabilities needed for videography or photography. Combined with the accelerometer and gyroscope, barometric pressure sensors enable drones to fly with precision. |
| 20 | RC Flight Simulator | An RC flight simulator is a computer program that allows pilots of radio-controlled aircraft to practice on a computer, without the risk and expense of damaging a real model. |
| 21 | Precision Hawk Tool Set | Farmers can use drones to track crop fertility and observe exactly where to apply resources like fertilizer and pesticides. Using this data, it's possible to achieve greater consistency and maximize production. Farmers need to keep a close eye on crops to prevent issues like theft and damage from people and wildlife. |

**1. Ultrasonic Pulse Velocity Test**



**2. Rebound Hammer Test**

**3. Rapid Chloride Permeability Test**



**4. Transmission line model**
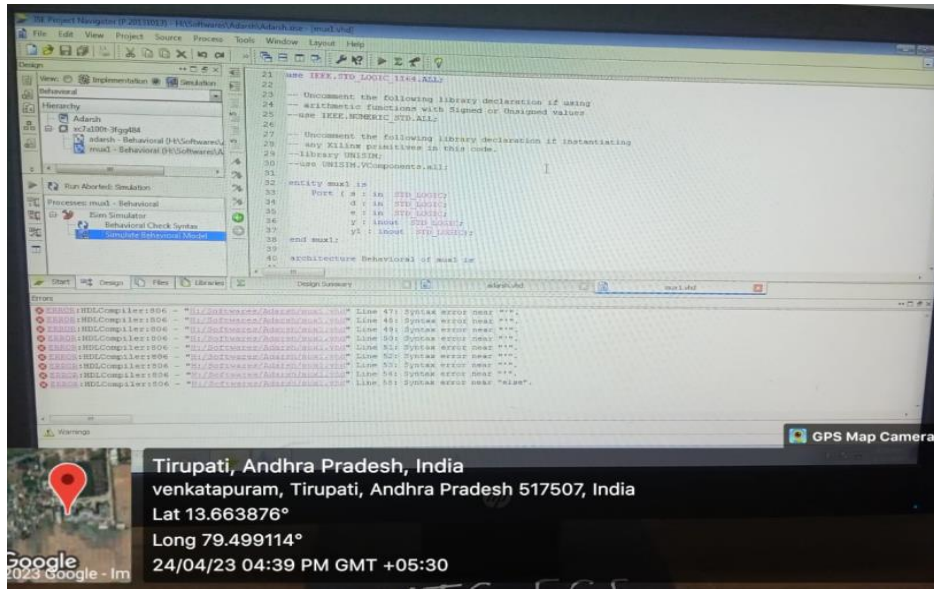
**5.Over/Under Voltage protection relay kit**



**6.Electromechanical type IDMT over voltage relay kit**

**7.Percentage Biased Differential relay for transformer protection kit**



**8.Dassault Systems**

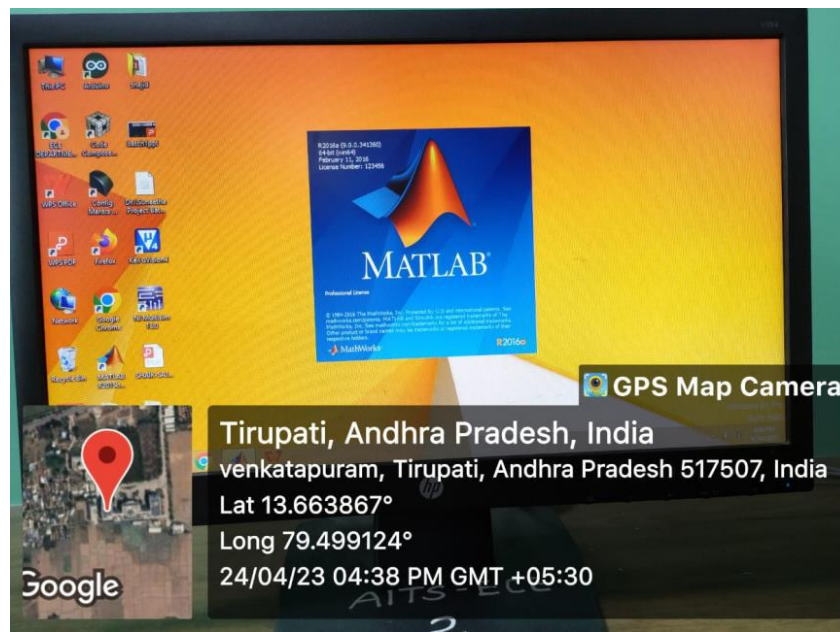**9. Xilinx 9.2**



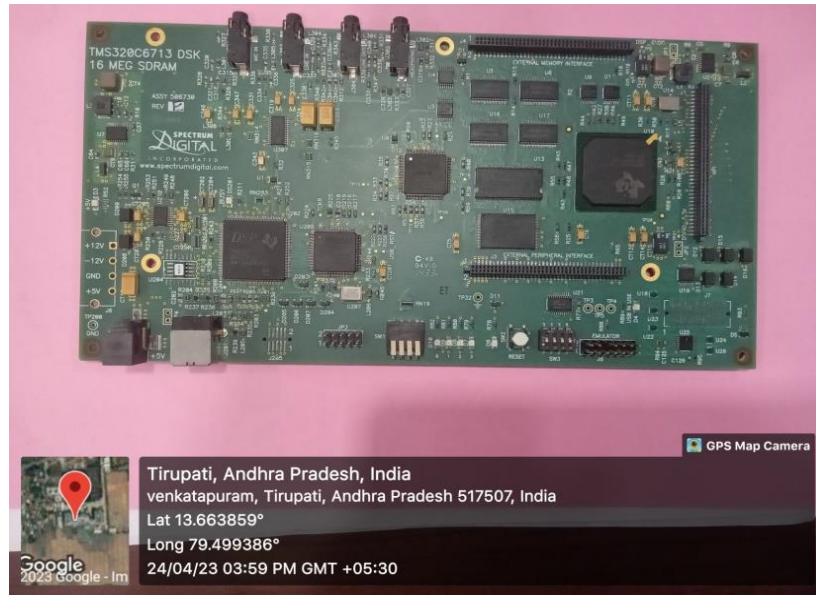**10.TIVA C- Series Launch Pad EKTM4C123GX**

**11.RaspberryPi**



**12.Arduino UNO processors**

**13.Node MCU Processors**



**14.MATLAB 8.2**

**15.DSP Trainer Kit**



**16.Code Composer Studio V6**

**17.FPV Quadcopter Drone 2.0 MP, WiFi, 720p, 120 degree wide angle camera**



**18.1080p FPV Insight 5G 100mW HDMI Wireless Video Transmitter**

**19.Sensors**



**20.RC Flight Simulator**

**21. Precision Hawk Tool Set**