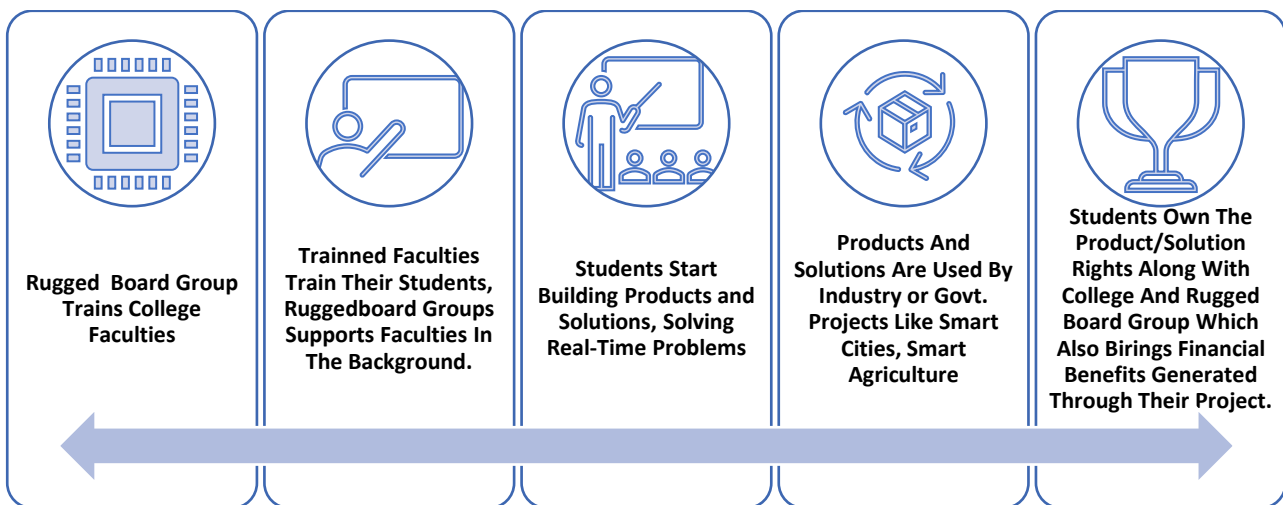


Industrial Embedded IoT Internship

Rugged Board is an Industrial grade IoT board developed by PHYTEC Embedded Pvt. Ltd Make in INDIA with German Quality. It is the first of its kind Industrial IoT Single Board Computer with multiple interfaces required for IIoT applications in Industry-4.0, Smart Cities, Smart Transportation, Smart Energy & Smart Agriculture. This IoT project would build big Hardware eco-system in INDIA and support Industries to develop their own IoT products & manufacture in INDIA with ease.

To promote MAKE IN INDIA & Aatmanirbhar Bharat by developing Products & Technology IPs in INDIA and bringing in University partners to hold major role in research & development, PHYTEC team would like to share the technical expertise with Trainers, Faculty members and students from university & together solve real-time industry problems and also bring in more innovations with latest technologies from University Labs.

Stages of Learning & Development:



Industrial Internship Embedded IoT Fundamental of Industrial IoT Product Development

Module-1: Linux Basics & Programming

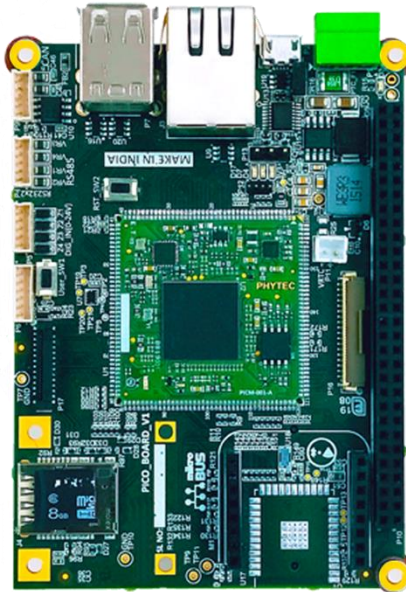
Linux Intro & Installation	<ul style="list-style-type: none"> - What is Linux, how it has been evolved, GNU License, Kernel - How Linux was designed, - Sub systems of Linux [Scheduler, Process, Memory Mgmt., File System, Device Mgmt.] - Ways to Install Linux [1. Dual Boot, 2. Within Windows, 3. Using Virtual Machine] - How to update Linux and install required packages
Linux Shell Commands	<ul style="list-style-type: none"> - Basic Commands - Dir & File Commands - System Commands - Misc. Commands
C Programming in Linux	<ul style="list-style-type: none"> - Writing C program on Linux - Compiling and executing Linux - Linux Executable format info & tools - Debugging C application on Linux using GDB - MQTT Experiments






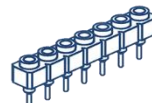







Make Files	<ul style="list-style-type: none"> - Understanding Make files - Writing Make files - Compiling Multiple src Dir using Make file - Advanced methods used in writing Make files
Module-2: HW Interface & Sensor Programming in eLinux	
Introduction, Setup & Hardware	<ul style="list-style-type: none"> - Introduction to Embedded Linux - ARM Processor Basics & Families - ARM Board Details and Schematic Overview - Boot Process - Host PC Setup for eLinux Development
Linux GPIO Programming	<ul style="list-style-type: none"> - Introduction to Linux GPIO SubSystem - Accessing GPIO using Sysfs - Programming GPIO's in C - Programming GPIO's using MRAA Lib in C - Programming GPIO's using MRAA Lib in PYTHON - LEDs, Switches Experiments - Relay Demo - Seven Segment Demo
Linux UART Programming	<ul style="list-style-type: none"> - Understanding Serial Port in Linux - Programming UART using C - Programming UART using MRAA Lib in C - Programming UART using MRAA Lib in PYTHON - GSM & GPS Experiments - Bluetooth Demos - RFID Card Read Demos - RS485 Modbus RTU Demo
Linux ADC Programming	<ul style="list-style-type: none"> - Understanding ADC Subsystem in Linux - Accessing ADC using SysFS - Programming ADC using MRAA Lib in C - Programming ADC using MRAA Lib in PYTHON - ADC Experiments using Resistor POT. - Temperature Sensor Interfacing Experiments
Linux PWM Programming	<ul style="list-style-type: none"> - Understanding PWM Subsystem in Linux - Accessing PWM using SysFS - Programming PWM using MRAA Lib in C - Programming PWM using MRAA Lib in PYTHON - PWM Experiments & verify using Oscilloscope. - Stepper Motor Interfacing Experiments - LED Driver Interface Demo
Linux I2C Programming	<ul style="list-style-type: none"> - Understanding I2C Subsystem in Linux - Programming I2C using MRAA Lib in C - Programming I2C using MRAA Lib in PYTHON - I2C MEMS Temp Sensor Experiment - I2C Accelerometer Temp Sensor Experiment
Linux SPI Programming	<ul style="list-style-type: none"> - Understanding SPI Subsystem in Linux - Programming SPI using MRAA Lib in C - Programming SPI using MRAA Lib in PYTHON - SPI MEMS Sensor Experiment - SPI Graphic OLED Interface Demo

Linux Ethernet Socket Programming	<ul style="list-style-type: none"> - Linux Network Socket Basics - TCP Client Server Experiments - UDP Client Server Experiments - HTTP REST API Cloud Experiment - MQTT Cloud Experiment
Linux CAN Socket Programming	<ul style="list-style-type: none"> - Linux CAN Socket Basics - CAN Socket Programming - CAN to DIO Card Interface Experiment - EV Charger Control Card Demo

Module-3: Project-1 Guidance	
Smart Wireless Switch (Home Automation)	
Smart Green House Automation (Smart Agri)	
Energy Management System (Industry-4.0)	
Smart Street Light System using LoRA	
Telematic Control Unit	

Complete Hands-On on INDIA's First Open Source Hardware "RuggedBOARD"
Swadeshi Single Board Computer



- 
A5D2x @500MHZ
CORTEX - A5
64MB RAM
32MB FLASH
- 
2 x USB
- 
DC & USB POWER
- 
RS-232
2 x RS232
- 
RS-485
1x RS485
- 
EXPANSION HEADER
- 
CAN
1 x CAN
- 
mikroBUS
mikroBUS CONN.
- 
1 X ETHERNET
- 
mPCIe CONN.
- 
TFT & CAP TOUCH
- 
1 x MICROSD SLOT
- 
MICRO SIM SLOT