COURSE STRUCTURE

FOR

Electronic Prototyping

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SEMESTER: 5

COURSE TITLE: Electronic Prototyping

PREREQUISITES FOR THE COURSE: None

DELIVERABLES FROM THE COURSE: Arduino Programming with different microcontroller boards, using IoT, using Raspberry Pi and other versatile prototyping tools. They will be able to take on automation projects,create simple prototypes of ideas and do microcontroller based projects.

DETAILS OF THE FINAL PROJECT: Final project will involve creating a prototype of an idea they chose, Choices: Iot smart lock, Home automation , Can-sat, 3-axis Gimbal,Bluetooth bot,Invisible harp. New ideas are encouraged too.

Week 1- Introduction to the world of microcontrollers:

Topics to be Taught:

Part 1

- Different Arduino boards and when to use them

Part 2

- Exploring the ide
- Familiarising with the arduino programming language.

Part 3

- Simulations with Tinker Cad circuits

Tasks to be completed:

- Try example programs
- Explore the Arduino IDE

Weekly Projects:

- Switch on and off an LED using your mobile phone via bluetooth
- Dimming LED
- Buzzer songs.

Week 2- Sensors and Actuators

Topics to be Taught:

Part 1

- Exploring some interesting sensors- Ultrasonic, humidity , PIR ,Gyrosope

Part 2

- Soldering and how to make your own sensors- Light intensity
- Boardless arduino

Part 3

- Communication protocols

Tasks to be completed:

- Research and create document of different sensors and working

Weekly Projects:

- Simple sensor based project- one sensor and one actuator.

Week 3- Internet Of Things

Topics to be Taught:

Part 1

- Dive into IoT
- What is IoT

Part 2

- Using WiFi Module/NodeMcU
- Using APIs for IoT

Tasks to be completed:

- Research the different communication techniques you can use to transmit data.
- Quiz about previous week's topics

Weekly Projects:

- Convert previous week's project into an Iot project

Week 4-Playing with the Pi

Topics to be Taught:

Part 1

- Introduction to Raspberry Pi for computationally intensive projects.
- Python with Pi

Part 2

- IoT with Pi.

Part 3

- MIT app inventor for simple app creation.

Tasks to be completed:

- Quiz on all topics
- Chose final project

Weekly Projects:

- Your own bluetooth light control app
- Prepare for final project