

Prerequisites

- Introduction to electricity
- Credit hours: 20

Course Requirements

- Laptop
- Arduino 101 Kit

COURSE DESCRIPTION

This is the basic course of programmable microcontrollers. Students will recognize some fundamentals of microcontrollers and programming from scratch.

The ubiquitous Arduino platform and the Arduino IDE which is C++ based program are what students going to be introduced, through a variety of basic practical Experiments. To be qualified for this course, the Introduction to electricity course is a must.

Learning Objectives

1. Knowledge and Understanding

- Realize and perceive what Microcontrollers and Arduino boards are, what kind of benefits can be got from.
- Give more consideration to engineering calculations, circuitry limitations and devices specifications when designing a circuit or an electrical/ electromechanical system.

2. Skills and capabilities:

- use information sources optimally to figure out required data for designing purposes.
- Design and program various systems range from simple systems to mid-levelled ones using Arduino platform.
- Solve some technical daily problems related to simple electrical circuits and devices.
- Recognize and use more programmatic skills which qualifies him to go deeply into more courses and applications.

CONTACT



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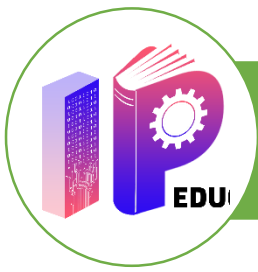
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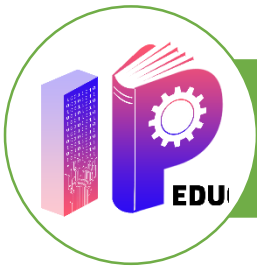


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COURSE SYLLABUS

#	Topics	No. of Lectures
Ch1: Introduction to Microcontrollers		
1	Microcontrollers and Engineering platforms	1
2	Arduino platform	
Ch2: Programmatic affairs		
1	Preamble <ul style="list-style-type: none"> • Introduction to Programming and the concept of OOP . 	1
2	Essentials <ul style="list-style-type: none"> • Understanding main concepts and definitions (data types, conditional statements, math operation, etc.). 	
3	Arduino IDE <ul style="list-style-type: none"> • Introduction to Arduino cc and a detailed view of Arduino IDE. 	
Ch3: Basics of control		
1	Arduino signals: <ul style="list-style-type: none"> • Digital Output • Digital Input • if" statement. • the concept of Pulse Width Modulation (PWM) • Analog Output • • Analog input 	2
2	Communication with Arduino : <ul style="list-style-type: none"> • Introduction to communication protocols • Serial Communication (using UART Protocol to connect an Arduino board with a computer). • "switch" statement. 	1
Ch4: Arduino and peripherals 1		
1	Introduction	1
2	Detect Motion: <ul style="list-style-type: none"> • Motion sensor and it's applications • "while" statement • Exp.1: Sensing motion 1 • Exp.2: Sensing motion 2 	



COURSE SYLLABUS

#	Topics	No. of Lectures
Ch4: Arduino and peripherals 1		
3	Display Data: <ul style="list-style-type: none">• Introduction to Arduino displays• Liquid Crystal Display (LCD) and it's applications• Exp.1: Looks1• Exp.2: Looks1	1
4	Data Entering: <ul style="list-style-type: none">• Keypad and it's applications• Exp.1: Inter your info• Exp.2: The password	1
5	Arduino and heavy loads <ul style="list-style-type: none">• Review about electrical heavy loads• Exp.1: Relay in action 1• Exp.2: Relay in action 2• Exp.3: Transistor in action 1	1
Graduation Project		1

Note: each lecture takes up to 2 hours