

Experiment No.	Unit No.	Section A: Arduino Board	Hrs.
<b>EX.1.0</b>		<b>Introduction to Arduino Board</b>	<b>02</b>
	1.1	<b>Introduction to Arduino Uno board and integrated development environment (IDE</b>	
	1	<b>Write the code for blinking the on board led with a specified delay</b> Apparatus Requirement: Hardware: Arduino Board LED, Software: Arduino IDE Software.	
<b>EX.2.0</b>		<b>GPIO (along with Analog pin) Programming</b>	<b>04</b>
	2.1	<b>Introduction to programming GPIO, Analog and PWM PINS.</b>	
	1	<b>Interface any Digital Sensors to the Arduino board and display sensor values on serial Monitor.</b>	
	2	<b>Interface any Analog sensor to the Arduino board and display sensor values on serial Monitor.</b>	
	3.	<b>Generate varying duty cycle PWM using Arduino.</b>	
<b>EX.3.0</b>		<b>Controlling output devices/Displaying</b>	<b>04</b>
	3.1	<b>Introduction to different sensor (Analog and Digital), Relays, Motors and display.</b>	
	1	<b>Interface an Analog Sensors to the Arduino board and display sensor values on LCD/TFT/Seven segment Display.</b>	
	2	<b>Interface a temperature sensor to Arduino and switch on a relay to operate a fan if temperature exceeds given threshold. Also display the temperature on any of the display device</b>	
<b>EX.4.0</b>		<b>Interfacing Communication Devices and Cloud Networking</b>	<b>04</b>
	4.1	<b>Introduction to Bluetooth, Zigbee, RFID and WIFI, specifications and interfacing methods.</b>	
	1	<b>Interface Wi-Fi /Bluetooth/GSM/Zigbee/RF module to Arduino and program it to transfer sensor data wirelessly between two devices. Any two techniques from the above-mentioned modules needs to be interfaced.</b>	
<b>5.0</b>		<b>Sample Projects</b>	<b>10</b>
	1.	<b>Waste Management System</b>	
	2.	<b>Smart City Solutions</b>	
	3.	<b>Energy Monitoring Systems</b>	
	4.	<b>Smart Classrooms and learning Solutions</b>	
	5.	<b>Home security systems</b>	
	6.	<b>Smart Agriculture solutions</b>	
	7.	<b>Healthcare solutions.</b>	
	8.	<b>Industrial Applications</b>	
	9.	<b>IoT Applications</b>	
	10.	<b>Robotics</b>	
<b>Section 'A' Total Hrs.</b>			<b>24</b>

Experiment No.	Unit No.	Section B: Raspberry Pi	Hrs.
<b>EX.1.0</b>		<b>Introduction to Raspberry PI</b>	<b>02</b>
	1.1	<b>What is Raspberry PI? Downloading and Installation of NOOBS, First Power-Up &amp; Having a Look around, Introduction to the Shell and Staying updated.</b>	
	1	<b>Familiarization with Raspberry PI and perform necessary software installation.</b> Apparatus Requirement: Hardware: Raspberry PI Board, Memory of 16GB, Power adapter, Memory Writer. Software: NOOBS, Raspbian OS, Win32 disk Imager, SD-Formatter software.	