SRI BHARATHI

ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi and Affiliated to Anna University, Chennai)

Kaikkurichi, Pudukkottai -622 303

www.sbec.edu.in

NAAC DOCUMENTS

Quality Indicator Frame Work

Criterion – 1

CURRICULAR ASPECTS

Submitted by

IQAC

Internal Quality Assurance Cell

Sri Bharathi Engineering College for Women

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25

KAIKKURUCHI, PUDUKOTTAI – 622 303

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2022-2023 / EVEN SEMESTER

1.2 Academic Flexibility (30)

1.2.1 Number of Certificate/Value added courses offered and online courses of MOOCs, SWAYAM, NPTEL etc. (where the students of the institution have enrolled and successfully completed during the last five years)

AND

1.2.2 Percentage of students enrolled in Certificate/ Value added courses and also completed online courses of MOOCs, SWAYAM, NPTEL etc. as against the total number of students during the last five years

Certificate Course Title:	**RECENT APPLICATIONS IN IOT USING ARDUINO AND RASPBERRY PI**				
Resource Person:	**Resource Person:** **Mr.M.PALANIAPPAN,** Assistant Professor/ECE Sri Bharathi Engineering College For Women	**Resource Person 1:** **Mrs.R.YOGESHWARI,** Assistant Professor/ECE Sri Bharathi Engineering College For Women			
Date of conduct from :	**30.01.2023(IV)** **02.02.2023(II&III)**	**To:**	**03.02.2023(IV)** **12.05.2023(II&III)**	**Duration:**	**30 Hrs**
Organized Department :	**ELECTRONICS AND COMMUNICATION ENGINEERING**				
Participant Year:	**4,3&2**	**Semester:**	**EVEN**	**No. of Students Registered :**	**31**
Venue:	**Seminar Hall, ,Ground Floor, SBECW**				

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SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)
Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2022-2023/EVEN SEMESTER

DEPARTMENT CIRCULAR

Date: 01.02.2023

Certificate Course offered by the Department of ECE will be conducted for Final year students on "**Recent Applications in IOT using Arduino and Raspbery PI**" in our college campus. The Classes will be held as per the schedule mentioned in the class time table. Certificates will be issued to the eligible participants at the end of the course.

S.No	Name of the Course	Resource Person
1	Recent Applications in IOT using Arduino and Raspbery PI	**Mr.M.PALANIYAPPAN,** Assistant Professor/ECE, Department of ECE, Sri Bharathi Engineering College for Women, Kaikkurichi, Pudukkottai.

HoD/ECE

HOD / ECE
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PUDUKKOTTAI - 622 303

Cc:

- Principal's Office
- IQAC Coordinator
- Class In charges- II ,III &IV Year
- IV Year ECE Students
- Notice Board

Dr. S.THILAGAVATHI M.E.,Ph.D.,
PRINCIPAL
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2022-20223/EVEN SEMESTER

Certificate course on **"Recent Applications in IOT using Arduino and Raspbery PI"**

SYLLABUS

S.NO	TOPIC COVERED	DURATION (in hours)	DATE FN/AN	RESOURCE PERSON
1	Introduction to IOT, IOT Architecture and Communication protocols ,Transducers, Classification, Roles of sensors in IOT	3	9.2.2023	Mr.M.Palaniyappan
2	Various types of sensors, Design of sensors, sensor architecture, special requirements for IOT sensors, Interfacing to the Real World	3	16.2.2023	Mr.M.Palaniyappan
3	Introduction of Arduino and its Types , Arduino Serial Monitor and Plotter	3	23.2.2023	Mr.M.Palaniyappan
4	Technologies Used In IoT , Protocols ,Creating Classes and Libraries with Arduino	3	2.3.2023	Mr.M.Palaniyappan
5	Getting started with Raspberry Pi, Booting Up RPi- Operating System and Linux Commands	3	9.3.2023	Mr.M.Palaniyappan
6	C Language- Imbibing RPi with C	3	16.3.2023	Mr.M.Palaniyappan
7	Working with RPi using Python and Sensing Data using Python, Python vs. Other Languages, Applications of Python	3	23.3.2023	Mr.M.Palaniyappan
8	Programming with Arduino , Arduino and ThingSpeak	3	30.3.2023	Mr.M.Palaniyappan
9	IoT Design using Raspberry Pi	3	6.4.2023	Mr.M.Palaniyappan
10	Using Node-RED Visual Editor on Rpi	3	13.4.2023	Mr.M.Palaniyappan
11	IoT-based Health and Wellness Applications.	3	20.4.2023	Mr.M.Palaniyappan
12	Implementing data analytics on collected IoT data.	3	27.4.2023	Mr.M.Palaniyappan
Total Hours		**36**		

M.Pari
Course Coordinator

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

DEPARTMENT OF ELECTRONICS AN COMMUNICATIONENGINEERING

ACADEMIC YEAR EVEN SEMESTER (2022-2023)

STUDENT PARTICIPATION LIST FOR CERTIFICATE COURSE PROGRAM

RECENT APPLICATIONS IN IOT USING ARDUINO AND RASPBERY PI

S.NO	REG.NO	NAME	YEAR & BRANCH
1	912619106001	AASHIMA M	IV& ECE
2	912619106002	ANANTHI P	IV& ECE
3	912619106004	JAFFARNISHA R	IV& ECE
4	912619106005	MAHESWARI K	IV& ECE
5	912619106006	MANISHA S	IV& ECE
6	912619106007	MEGAVADHANA A	IV& ECE
7	912619106008	PRIYANGA R	IV& ECE
8	912619106009	RAGAVI V	IV& ECE
9	912619106010	RAJAPRABA M	IV& ECE
10	912619106011	SASIKA K	IV& ECE

Course Coordinator

HoD/ ECE

HOD / ECE
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PUDUKKOTTAI - 622 303

Dr. S.THILAGAVATHI M.E.,Ph.D.,
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KAIKKURICHI, PUDUKKOTTAI-622 303
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR EVEN SEMESTER (2022-2023)

ATTENDANCE SHEET FOR CERTIFICATE COURSE PROGRAM- RECENT APPLICATIONS IN IOT USING ARDUINO AND RASPBERY PI

S.NO	REG. NO	NAME	YEAR/ BRANCH	2/2/2023 AN	9/2/2023 AN	16/2/2023 AN	23/2/2023 AN	2/3/2023 AN	9/3/2023 AN	16/3/2023 AN	23/3/2023 AN	30/3/2023 AN	6/4/2023 AN	13/4/2023 AN	20/4/2023 AN	No. of Sessions Attended	Sign of Student
1	912619106001	AASHIMA M	IV/ECE	a	a	/	/	/	/	/	/	/	/	/	/	10	
2	912619106002	ANANTHI P	IV/ECE	/	/	/	/	/	/	/	/	/	/	a	/	11	
3	912619106004	JAFFARNISHA R	IV/ECE	/	/	/	/	/	a	a	/	/	/	/	/	10	
4	912619106005	MAHESWARI K	IV/ECE	/	/	/	/	/	/	/	/	/	/	/	/	12	
5	912619106006	MANISHA S	IV/ECE	/	/	a	a	/	/	/	/	/	/	/	/	10	
6	912619106007	MEGAVADHANA A	IV/ECE	a	/	/	/	/	/	/	a	a	/	/	/	9	
7	912619106008	PRIYANGA R	IV/ECE	/	/	/	/	/	/	/	/	/	/	a	/	11	
8	912619106009	RAGAVI V	IV/ECE	/	/	/	/	/	/	/	a	/	/	/	/	11	
9	912619106010	RAJAPRABA M	IV/ECE	/	/	/	/	/	/	/	/	/	/	/	/	12	
10	912619106011	SASIKA K	IV/ECE	/	/	a	a	/	/	/	/	/	/	/	/	10	

M. Priya
Course Coordinator

Dr. S.THILAGAVATHI M.E.,Ph.D.,
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Report on Certificate Course

Title:	Recent Applications in IOT using Arduino and Raspbery PI
Resource Person:	**Mr.M.PALANIAPPAN,** Assistant Professor/ECE

Date of conduct from :	**02.02.2023**	To:	**12.05.2023**	Duration:	**30 Hours**
Organized Department :	**Electronics and Communication Engineering**				
Participant Year:	**4**	Semester:	**ODD**	No. of Students Registered :	**10**
Venue:	**Seminar Hall, ,Ground Floor, SBECW**				

Outcome of Certificate Course (CC) :At the end of Course ,Students can able to

- Understand the basic concepts and principles of the Internet of Things (IoT), including the role of sensors, actuators, communication protocols, data processing, and cloud integration.
- Learn how to interface and integrate different sensors with Arduino and Raspberry Pi, collect data from the physical world, and understand data acquisition techniques.
- Explore various communication protocols commonly used in IoT applications, such as MQTT, HTTP, and WebSocket, and implement them to establish data exchange between devices and servers.
- Understand the importance of IoT security and privacy concerns, exploring strategies for securing IoT devices, data, and communication channels.
- Develop troubleshooting and debugging skills to identify and resolve common issues encountered during IoT application development.

No. of students successfully completed the certificate course is **10 Students** based on the following Assessment process.

Assessment Process

- Students securing **more than 60% on total score** and secured more than **75%** in attendance is eligible to receive the certificate for the Certificate course conducted
- Total Score = (0.5 *Attendance in CC out of 100 percentage + 0.5 *Test mark in CC out of 100 marks)

M.Palani
Course Coordinator

HoD/ ECE

HOD / ECE
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PUDUKKOTTAI - 622 303.

Principal

16/05/23

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PUDUKKOTTAI DISTRICT

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE OF PARTICIPATION

This is to Certify that Mr/Ms. **AASHIMA M** (Reg.No: **912619106001**), **IV** ECE has successfully completed Certificate Course on "Recent Applications in IOT using Arduino and Raspbery PI" held at our college campus from 02.02.2023 to 12.05.2023 for the academic year 2022-2023.

COURSE COORDINATOR

Dr. S.THILAGAVATHI M.E.,Ph.D.,
PRINCIPAL
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COLLEGE FOR WOMEN
Kaikkurichi - 622 303, Pudukkottai Dt

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE OF PARTICIPATION

This is to Certify that Mr/Ms. **MANISHA S** (Reg.No: **912619106006**), **IV** ECE has successfully completed Certificate Course on "Recent Applications in IOT using Arduino and Raspbery PI" held at our college campus from 02.02.2023 to 12.05.2023 for the academic year 2022-2023.

COURSE COORDINATOR

Dr. S.THILAGAVATHI M.E., Ph.D.,
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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

Name of the Student : **Year/Sem:IV/VIII**

AU Register Number:

Certificate Course on **"Recent Applications in IoT using Ardunio and Raspbery Pi "**

MCQ QUESTIONS (25X1 = 25 Marks)

1. Which of the following is a popular microcontroller board commonly used in IoT projects?
   a) Raspberry Pi
   b) b) Arduino
   c) c) BeagleBone
   d) d) NVIDIA Jetson

2. What is the primary function of the Arduino in IoT applications?
   a) Handling complex computations
   b) Data visualization
   c) Sensor data processing
   d) Cloud-based data storage

3. Which programming language is commonly used to program Arduino boards for IoT applications?
   a) Java
   b) C++
   c) Python
   d) JavaScript

4. What is the role of Raspberry Pi in IoT projects?
   a) Real-time sensor data processing
   b) Wireless communication between devices
   c) Cloud-based data analytics
   d) Edge computing and data aggregation

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5. Which of the following wireless communication protocols is commonly used in IoT projects with Arduino and Raspberry Pi?
   a) Bluetooth
   b) Zigbee
   c) Wi-Fi
   d) All of the above

6. Which board is well-suited for power-constrained IoT applications due to its low energy consumption?
   a) Arduino Uno
   b) Raspberry Pi 3 Model B+
   c) Arduino Nano
   d) Raspberry Pi 4 Model

7. What is the significance of GPIO (General Purpose Input Output) pins on both Arduino and Raspberry Pi boards?
   a) They provide power to the board.
   b) They enable communication with external devices and sensors.
   c) They store the boot configuration of the board.
   d) They allow access to the internet

8. Which of the following is an example of an IoT application using Arduino and Raspberry Pi?
   a) Facial recognition system
   b) Autonomous car
   c) Smart home automation
   d) Online shopping platform

9. Which board has more computational power, enabling it to handle more complex tasks like running web servers or databases?
   a) Arduino
   b) Raspberry Pi
   c) Both have similar computational power
   d) None of the above

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10. Which board is more suitable for real-time data processing directly at the source of data collection?
    a) Arduino
    b) Raspberry Pi
    c) Both are equally suitable
    d) It depends on the specific application requirements

11. What is the primary benefit of using MQTT (Message Queuing Telemetry Transport) in IoT applications with Arduino and Raspberry Pi?
    a) Real-time video streaming
    b) Secure data storage
    c) Low latency communication
    d) Scalability for handling large datasets

12. Which of the following is NOT a sensor commonly used with Arduino and Raspberry Pi in IoT projects?
    a) Temperature sensor b) Motion sensor c) Camera sensor d) RFID sensor

13. What does the term "IoT gateway" refer to in the context of Arduino and Raspberry Pi applications?
    a) A physical entrance to an IoT network
    b) A device that bridges communication between IoT devices and the cloud
    c) A secure connection protocol for IoT devices
    d) A platform for developing IoT applications

14. Which programming language is commonly used for Raspberry Pi development in IoT projects?
    a) C#
    b) Python
    c) Java
    d) Ruby

15. Which board is typically used for battery-powered IoT applications due to its energy efficiency?
    a) Raspberry Pi Zero
    b) Raspberry Pi 4 Model B

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c) Arduino Mega 2560
d) Arduino Uno

16. Which of the following communication protocols is commonly used for short-range communication between IoT devices in a home automation scenario?
    a) Wi-Fi
    b) b) Bluetooth
    c) c) LoRaWAN
    d) d) 5G

17. In IoT applications with Arduino and Raspberry Pi, what is MQTT used for?
    a) Data storage
    b) Sensor calibration
    c) Real-time communication between devices
    d) Machine learning model training

18. What is the primary role of a sensor node in an IoT network?
    a) Data visualization
    b) Data analysis
    c) Data storage
    d) Sensing and collecting data from the environment

19. Which of the following is an example of a recent IoT application that combines Arduino and Raspberry Pi technology?
    a) Autonomous drone delivery b) Virtual reality gaming
    c) Satellite communication d) Online banking

20. Which board provides a more suitable platform for prototyping and experimentation in IoT projects?
    a) Raspberry Pi
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DEPARTMENT OF ECE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2022-2023/EVEN SEMESTER

Certificate Course on **Recent Applications in IoT using Ardunio and Raspbery Pi**

MCQ ANSWER KEY

1	B	**6**	C	**11**	C	**16**	B
2	C	**7**	B	**12**	C	**17**	C
3	B	**8**	C	**13**	B	**18**	D
4	D	**9**	B	**14**	B	**19**	A
5	D	**10**	A	**15**	A	**20**	C

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18/20

Name of the Student : Rajapraba.M **Year/Sem:IV/VIII**

AU Register Number: 912619106010

Certificate Course on **"Recent Applications in IoT using Ardunio and Raspbery Pi "**

MCQ QUESTIONS (25X1 = 25 Marks)

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c) Arduino Mega 2560
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Dr. S.THILAGAVATHI M.E.,Ph.D.
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DEPARTMENT OF ELECTRONICS AND COMMUNICATIONENGINEERING

ACADEMIC YEAR EVEN SEMESTER (2022-2023)

MARK SHEET FOR CERTIFICATE COURSE- RECENT APPLICATIONS IN IOT USING ARDUINOAND RASPBERY PI

S.NO	REGISTER NUMBER	NAME	YEAR & BRANCH	Attendance (A)		VAC –MCQ TEST (B)		OVERALL MARK(100) (50% of A + 50% of B)
				No.of Sessions Attented	Marks (100)	No.of Correct Answer	Marks (100)	
1	912619106001	AASHIMA M	IV&ECE	10	83	16	80	82
2	912619106002	ANANTHI P	IV&ECE	11	92	18	90	91
3	912619106004	JAFFARNISHA R	IV&ECE	10	83	17	85	84
4	912619106005	MAHESWARI K	IV&ECE	12	100	14	60	80
5	912619106006	MANISHA S	IV&ECE	10	83	17	85	84
6	912619106007	MEGAVADHANA A	IV&ECE	9	75	19	95	85
7	912619106008	PRIYANGA R	IV&ECE	11	92	16	80	86
8	912619106009	RAGAVI V	IV&ECE	11	92	16	80	86
9	912619106010	RAJAPRABA M	IV&ECE	12	100	18	90	95
10	912619106011	SASIKA K	IV&ECE	10	83	19	95	89

Course Coordinator

Dr. S.THILAGAVATHI M.E.,Ph.D.,
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2022-2023/EVEN SEMESTER

DEPARTMENT CIRCULAR

Date: 19.01.2023

Certificate Course offered by the Department of ECE will be conducted for all second, third year students on "**Recent Applications in IOT using Arduino and Raspbery PI**" in our college campus from 30.01.2023 to 03.02.2023.Certificates will be issued to the eligible participants at the end of the course.

S.No	Name of the Course	Resource Person
1	Recent Applications in IOT using Arduino and Raspbery PI	**1. Mrs.R.YOGESHWARI,** HoD/ECE, Department of ECE, Sri Bharathi Engineering College for Women, Kaikkurichi, Pudukkottai.
		2. Mr.C.PALANIYAPPAN, Assistant Professor/ECE, Department of ECE, Sri Bharathi Engineering College for Women, Kaikkurichi, Pudukkottai.

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Cc:

- Principal's Office
- IQAC Coordinator
- Class In charges- II ,III &IV Year
- II & III Year ECE Students
- Notice Board

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2022-20223/EVEN SEMESTER

Certificate course on "**Recent Applications in IOT using Arduino and Raspbery PI**"

SYLLABUS

S.NO	TOPIC COVERED	DURATION (in hours)	DATE FN/AN	RESOURCE PERSON
1	Introduction to IOT, IOT Architecture and Communication protocols ,Transducers, Classification, Roles of sensors in IOT	3	30.1.2023	Mrs.R.Yogeshwari
2	Various types of sensors, Design of sensors, sensor architecture, special requirements for IOT sensors, Interfacing to the Real World	3	30.1.2023	Mr.M.Palaniyappan
3	Introduction of Arduino and its Types , Arduino Serial Monitor and Plotter	3	31.1.2023	Mr.M.Palaniyappan
4	Technologies Used In IoT , Protocols ,Creating Classes and Libraries with Arduino	3	31.1.2023	Mrs.R.Yogeshwari
5	Getting started with Raspberry Pi, Booting Up RPi- Operating System and Linux Commands	3	1.2.2023	Mr.M.Palaniyappan
6	C Language- Imbibing RPi with C	3	1.2.2023	Mrs.R.Yogeshwari
7	Working with RPi using Python and Sensing Data using Python, Python vs. Other Languages, Applications of Python	3	2.2.2023	Mrs.R.Yogeshwari
8	Programming with Arduino , Arduino and ThingSpeak	3	2.2.2023	Mr.M.Palaniyappan
9	IoT Design using Raspberry Pi	3	3.2.2023	Mrs.R.Yogeshwari
10	Using Node-RED Visual Editor on Rpi	3	3.2.2023	Mr.M.Palaniyappan
Total Hours		**30**		

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DEPARTMENT OF ELECTRONICS AN COMMUNICATIONENGINEERING

ACADEMIC YEAR EVEN SEMESTER (2022-2023)

STUDENT PARTICIPATION LIST FOR CERTIFICATE COURSE PROGRAM

RECENT APPLICATIONS IN IOT USING ARDUINO AND RASPBERY PI

S.NO	REG.NO	NAME	YEAR & BRANCH
1	912621106001	AMRIN M	II & IV
2	912621106002	BHUVANESWARI C	II & IV
3	912621106003	DHANYASHREE A	II & IV
4	912621106004	KALAIVANI R	II & IV
5	912621106005	KAVIYA K	II & IV
6	912621106006	KEERTHANA V	II & IV
7	912621106007	PAVITHRA P	II & IV
8	912621106008	RAJESHWARI R	II & IV
9	912621106009	SUBALAKSHMI M	II & IV
10	912621106010	SUGUNA C	II & IV
11	912621106301	JAYAPRIYA M	II & IV
12	912621106302	KIRUBASHINI C	II & IV
13	912620106001	ABIRAMI S	III & VI
14	912620106002	ANUSHYA M	III & VI
15	912620106003	ARTHI S	III & VI
16	912620106004	JEYASRI K	III & VI
17	912620106006	SENPAGAHARINI V	III & VI
18	912620106007	SONIYA P	III & VI
19	912620106301	ABITHA S	III & VI
20	912620106302	DESIKA G	III & VI
21	912620106303	SABAREESWARI S	III & VI

Course Coordinator

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR EVEN SEMESTER (2022-2023)

ATTENDANCE SHEET FOR CERTIFICATE COURSE PROGRAM- RECENT APPLICATIONS IN IOT USING ARDUINO AND RASPBERY PI

S.No	REG. NO	NAME	YEAR/ BRANCH	30.01.2023		31.01.2023		1.02.2023		2.02.2023		3.02.2023		No. of Sessions Attended	Sign of Student
				F.N	A.N	F.N	A.N	F.N	A.N	F.N	A.N	F.N	A.N		
1	912621106001	AMRIN M	II/ECE	/	/	a	/	/	/	/	/	/	/	9	
2	912621106002	BHUVANESWARI C	II/ECE	/	/	/	/	/	/	/	/	/	/	10	
3	912621106003	DHANYASHREE A	II/ECE	a	a	/	/	/	/	/	/	/	/	8	
4	912621106004	KALAIVANI R	II/ECE	/	/	/	/	/	/	a	/	/	/	9	
5	912621106005	KAVIYA K	II/ECE	/	/	a	a	/	/	/	/	/	/	8	
6	912621106006	KEERTHANA V	II/ECE	/	/	/	/	/	/	/	/	/	/	10	
7	912621106007	PAVITHRA P	II/ECE	a	/	/	/	/	/	/	/	/	/	10	
8	912621106008	RAJESHWARI R	II/ECE	a	/	/	/	/	/	/	/	/	/	9	
9	912621106009	SUBALAKSHMI M	II/ECE	a	/	/	/	/	/	/	/	/	/	9	
10	912621106010	SUGUNA C	II/ECE	/	/	/	/	/	/	/	/	/	/	10	
11	912621106301	JAYAPRIYA M	II/ECE	/	/	/	/	/	/	/	/	/	/	10	
12	912621106302	KIRUBASHINI C	II/ECE	/	/	/	/	/	/	/	/	/	/	10	
13	912620106001	ABIRAMI S	III/ECE	/	/	/	/	/	/	/	/	/	/	10	
14	912620106002	ANUSHYA M	III/ECE	/	/	a	a	/	/	/	/	/	/	8	
15	912620106003	ARTHI S	III/ECE												

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16	912620106004	JEYASRI K	III/ECE	/	/	/	/	/	/	/	/	/	/	10	K. Jeya
17	912620106006	SENPAGAHARINI V	III/ECE	a	a	/	/	/	/	/	/	/	/	8	V. Senpa
18	912620106007	SONIYA P	III/ECE	/	/	/	/	/	/	/	/	/	/	10	P. Soniya
19	912620106301	ABITHA S	III/ECE	/	/	/	/	a	/	/	/	/	/	9	Abi. S
20	912620106302	DESIKA G	III/ECE	/	/	/	/	a	a	/	/	/	/	8	G Desika
21	912620106303	SABAREESWARI S	III/ECE	/	/	/	/	/	/	/	/	/	/	10	S. Sabari

Course Coordinator

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Report on Certificate Course

Title:	Recent Applications in IOT using Arduino and Raspbery PI
Resource Person:	**1.Mrs.R.YOGESHWARI,** HoD/ECE **2.Mr.M.PALANIAPPAN,** Assistant Professor/ECE

Date of conduct from :	**30.01.2023**	To:	**03.02.2023**	Duration:	**30 Hours**
Organized Department :	**Electronics and Communication Engineering**				
Participant Year:	**2/ 3**	Semester:	**ODD**	No. of Students Registered :	**21**
Venue:	**Seminar Hall, ,Ground Floor, SBECW**				

Outcome of Certificate Course (CC) :At the end of Course ,Students can able to

- Understand the basic concepts and principles of the Internet of Things (IoT), including the role of sensors, actuators, communication protocols, data processing, and cloud integration.
- Learn how to interface and integrate different sensors with Arduino and Raspberry Pi, collect data from the physical world, and understand data acquisition techniques.
- Explore various communication protocols commonly used in IoT applications, such as MQTT, HTTP, and WebSocket, and implement them to establish data exchange between devices and servers.
- Understand the importance of IoT security and privacy concerns, exploring strategies for securing IoT devices, data, and communication channels.
- Develop troubleshooting and debugging skills to identify and resolve common issues encountered during IoT application development.
- No. of students successfully completed the certificate course is **21 Students** based on the following Assessment process.

Assessment Process

- Students securing **more than 60% on total score** and secured more than **75%** in attendance is eligible to receive the certificate for the Certificate course conducted
- Total Score = (0.5 *Attendance in CC out of 100 percentage + 0.5 *Test mark in CC out of 100 marks)

Course Coordinator | **HoD/ ECE** | **Principal**

06/12/23

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PUDUKKOTTAI DISTRICT

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE OF PARTICIPATION

This is to Certify that Mr/Ms. **RAJESHWARI R** (Reg.No: **912621106008**), **II** ECE has successfully completed Certificate Course on "Recent Applications in IOT using Arduino and Raspbery PI" held at our college campus from 30.01.2023 to 03.02.2023 for the academic year 2022-2023 [5 Days].

COURSE COORDINATOR

Dr. S.THILAGAVATHI M.E.,Ph.D.,
PRINCIPAL
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COLLEGE FOR WOMEN
Kaikkurchi - 622 303, Pudukkottai Dt.

PRINCIPAL

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE OF PARTICIPATION

This is to Certify that Mr/Ms. **ABITHA S** (Reg.No: **912620106301**), **III** ECE has successfully completed Certificate Course on "Recent Applications in IOT using Arduino and Raspbery PI" held at our college campus from 30.01.2023 to 03.02.2023 for the academic year 2022-2023 [5 Days].

COURSE COORDINATOR

Dr. S.THILAGAVATHI M.E.,Ph.D.,
PRINCIPAL
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COLLEGE FOR WOMEN
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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

Name of the Student : **Year/Sem: II &III/IV&VI**

AU Register Number:

Certificate Course on **"Recent Applications in IoT using Ardunio and Raspbery Pi "**

MCQ QUESTIONS (25X1 = 25 Marks)

1. The Raspberry Pi is defined as the _____
   a) Micro Computer
   b) Mega Computer
   c) Mini computer
   d) Nano Computer

2. Raspbian is _____
   a) Assembler
   b) Language
   c) Compiler
   d) OS

3. Raspberry Pi consists of a _____ quad-core processor or microprocessor.
   a) 16-bit
   b) 32-bit
   c) 64-bit
   d) 128-bit

4. The Raspberry Pi has a _____ interface to allow it to perform serial data communications.
   a) UART
   b) GPIO
   c) I2C
   d) SPI

5. How many USB ports are present in Raspberry Pi 3?
   a) 5
   b) 2
   c) 4
   d) 3

6. What bit processor is used in Pi 3?
   a) 64-bit
   b) 32-bit
   c) 128-bit
   d) Both 64 and 32 bit

7. What is the speed of operation in Pi 3?
   a) 900MHz
   b) 1.2GHz
   c) 1GHz
   d) 500MHz

8. What is the Ethernet/LAN cable used in RPi?
   a) Cat5
   b) Cat5e
   c) Cat6
   d) RJ45

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9. How many Input/Output pins on board Raspberry Pi3 has?
   a) 20
   b) 30
   c) 40
   d) 50

10. How much RAM, the Raspberry Pi has?
   a) 2GiB of RAM
   b) 1GiB of RAM
   c) 4GiB of RAM
   d) 8GiB of RAM

11. What is the maximum peripheral current draw allowed in Raspberry Pi 3?
   a) 1200 mA
   b) 700 mA
   c) 500 mA
   d) 100 mA

12. Does micro SD card present in all modules?
   a) True
   b) False

13. Does Raspberry Pi need external hardware?
   a) True
   b) False

14. Does RPi have an internal memory?
   a) True
   b) False

15. Which operating system Raspberry Pi has?
   a)Linux
   b) OpenBSD
   c) NetBSD
   d) All of the above

16. How power supply is done to RPi?
   a) USB connection
   b) Internal battery
   c) Charger
   d) Adapter

17. What are the mode(s) used for addressing the pins in Raspberry Pi?
   a) GPI
   b) BCM
   c) BOARD & BCM
   d) GPIO, BCIM & CAN

18. What are the parameters that are default values?
   a) Port_Name and Bits
   b) Speed and Port_Names
   c) Speed and Parity
   d) Stop bit and Flow Control

19. The BCM 14 pin of Raspberry Pi is
   a) Physical pin 8
   b) UART
   c) Transmitter pin
   d) All of the above

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20. What is the command used for easy using of GNU screen?

a) $useradd -G {dialout} your_name
b) Screen Port_Name115200
c) Minicom -b 115200 -o -D
d) Prompt> # help

21. GPIO stand for General Purpose Input Output Pins
a) True
b) False

22. Which instruction set architecture is used in Raspberry Pi?
a) X86
b) MSP
c) AVR
d) ARM

23. Which instruction set is used in Raspberry Pi?
a) CISC
b) RISC
c) MIPS
d) None of these mentioned

24. Which of the following variants of Raspberry Pi has an inbuilt wi-fi?
a) Raspberry Pi 2
b) Raspberry Pi 3
c) Raspberry Pi A+
d) Raspberry Pi Zero

25. Which of the following is not a types of Raspberry Pi?
a) Raspberry Pi Alternatives
b) Raspberry Pi Zero W
c) Raspberry Pi 3 Model B+
d) Raspberry Pi 3 Model A+

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DEPARTMENT OF ECE

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2022-2023/EVEN SEMESTER

Certificate Course on **Recent Applications in IoT Using Ardunio and Raspbery Pi**

MCQ ANSWER KEY

1	C	**6**	A	**11**	A	**16**	A	**21**	A
2	D	**7**	B	**12**	A	**17**	C	**22**	D
3	C	**8**	D	**13**	B	**18**	B	**23**	C
4	A	**9**	C	**14**	A	**19**	D	**24**	B
5	C	**10**	B	**15**	D	**20**	B	**25**	D

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Name of the Student : R. Kalaivani **Year/Sem: II &III/IV&VI**

AU Register Number: 912621106004

Certificate Course on **"Recent Applications in IoT using Ardunio and Raspbery Pi "**

20/25

MCQ QUESTIONS (25X1 = 25 Marks)

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c) Raspberry Pi 3 Model B+
d) Raspberry Pi 3 Model A+

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

Name of the Student : P. Soniya **Year/Sem: II &III/IV&VI**

AU Register Number: 912620106007

Certificate Course on **"Recent Applications in IoT using Ardunio and Raspbery Pi "**

22/25

MCQ QUESTIONS (25X1 = 25 Marks)

1. The Raspberry Pi is defined as the _____
   a) Micro Computer
   b) Mega Computer
   c) Mini computer
   d) Nano Computer

2. Raspbian is _____
   a) Assembler
   b) Language
   c) Compiler
   d) OS

3. Raspberry Pi consists of a _____ quad-core processor or microprocessor.
   a) 16-bit
   b) 32-bit
   c) 64-bit
   d) 128-bit

4. The Raspberry Pi has a _____ interface to allow it to perform serial data communications.
   a) UART
   b) GPIO
   c) I2C
   d) SPI

5. How many USB ports are present in Raspberry Pi 3?
   a) 5
   b) 2
   c) 4
   d) 3

6. What bit processor is used in Pi 3?
   a) 64-bit
   b) 32-bit
   c) 128-bit
   d) Both 64 and 32 bit

7. What is the speed of operation in Pi 3?
   a) 900MHz
   b) 1.2GHz
   c) 1GHz
   d) 500MHz

8. What is the Ethernet/LAN cable used in RPi?
   a) Cat5
   b) Cat5e
   c) Cat6
   d) RJ45

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9. How many Input/Output pins on board Raspberry Pi3 has?
   a) 20
   b) 30
   c) 40
   d) 50

10. How much RAM, the Raspberry Pi has?
   a) 2GiB of RAM
   b) 1GiB of RAM
   c) 4GiB of RAM
   d) 8GiB of RAM

11. What is the maximum peripheral current draw allowed in Raspberry Pi 3?
   a) 1200 mA
   b) 700 mA
   c) 500 mA
   d) 100 mA

12. Does micro SD card present in all modules?
   a) True
   b) False

13. Does Raspberry Pi need external hardware?
   a) True
   b) False

14. Does RPi have an internal memory?
   a) True
   b) False

15. Which operating system Raspberry Pi has?
   a)Linux
   b) OpenBSD
   c) NetBSD
   d) All of the above

16. How power supply is done to RPi?
   a) USB connection
   b) Internal battery
   c) Charger
   d) Adapter

17. What are the mode(s) used for addressing the pins in Raspberry Pi?
   a) GPI
   b) BCM
   c) BOARD & BCM
   d) GPIO, BCIM & CAN

18. What are the parameters that are default values?
   a) Port_Name and Bits
   b) Speed and Port_Names
   c) Speed and Parity
   d) Stop bit and Flow Control

19. The BCM 14 pin of Raspberry Pi is
   a) Physical pin 8
   b) UART
   c) Transmitter pin
   d) All of the above

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20. What is the command used for easy using of GNU screen?

a) $useradd -G {dialout} your_name
b) Screen Port_Name115200
c) Minicom -b 115200 -o -D
d) Prompt> # help

21. GPIO stand for General Purpose Input Output Pins
a) True
b) False

22. Which instruction set architecture is used in Raspberry Pi?
a) X86
b) MSP
c) AVR
d) ARM

23. Which instruction set is used in Raspberry Pi?
a) CISC
b) RISC
c) MIPS
d) None of these mentioned

24. Which of the following variants of Raspberry Pi has an inbuilt wi-fi?
a) Raspberry Pi 2
b) Raspberry Pi 3
c) Raspberry Pi A+
d) Raspberry Pi Zero

25. Which of the following is not a types of Raspberry Pi?
a) Raspberry Pi Alternatives
b) Raspberry Pi Zero W
c) Raspberry Pi 3 Model B+
d) Raspberry Pi 3 Model A+

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DEPARTMENT OF ECE

DEPARTMENT OF ELECTRONICS AND COMMUNICATIONENGINEERING

ACADEMIC YEAR EVEN SEMESTER (2022-2023)

MARK SHEET FOR CERTIFICATE COURSE- RECENT APPLICATIONS IN IOT USING ARDUINO AND RASPBERY PI

S.NO	REGISTER NUMBER	NAME	YEAR & BRANCH	Attendance (A)		VAC –MCQ TEST (B)		OVERALL MARK(100) (50% of A + 50% of B)
				No.of Sessions Attented	Marks (100)	No.of Correct Answer	Marks (100)	
1	912621106001	AMRIN M	II /ECE	9	90	22	88	89
2	912621106002	BHUVANESWARI C	II /ECE	10	100	23	92	96
3	912621106003	DHANYASHREE A	II /ECE	8	80	21	84	82
4	912621106004	KALAIVANI R	II /ECE	9	90	20	80	85
5	912621106005	KAVIYA K	II /ECE	8	80	19	76	78
6	912621106006	KEERTHANA V	II /ECE	10	100	20	80	90
7	912621106007	PAVITHRA P	II /ECE	10	100	21	84	92
8	912621106008	RAJESHWARI R	II /ECE	9	90	19	76	83
9	912621106009	SUBALAKSHMI M	II /ECE	9	90	18	72	81
10	912621106010	SUGUNA C	II /ECE	10	100	22	88	94

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11	912621106301	JAYAPRIYA M	II /ECE	10	100	20	80	90
12	912621106302	KIRUBASHINI C	II /ECE	10	100	19	76	88
13	912620106001	ABIRAMI S	III / ECE	10	100	18	72	86
14	912620106002	ANUSHYA M	III / ECE	8	80	20	80	80
15	912620106003	ARTHI S	III / ECE	10	100	20	80	90
16	912620106004	JEYASRI K	III / ECE	10	100	18	72	86
17	912620106006	SENPAGAHARINI V	III / ECE	8	80	19	76	78
18	912620106007	SONIYA P	III / ECE	10	100	22	88	94
19	912620106301	ABITHA S	III / ECE	9	90	19	76	83
20	912620106302	DESIKA G	III / ECE	8	80	18	72	76
21	912620106303	SABAREESWARI S	III / ECE	10	100	19	76	88

Course Coordinator

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