



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 – 2

Teaching-Learning and Evaluation

Submitted by

IQAC

Internal Quality Assurance Cell

Sri Bharathi Engineering College for Women



Criteria 2

Teaching-Learning and Evaluation

350

Key Indicator- 2.3. Teaching- Learning Process (40)

2021-2022

**ELECTRONICS AND
COMMUNICATION ENGINEERING**

PARTICIPATIVE LEARNING

Activity	Number of Students attended	Page No.
Value Added Course (VAC)	64	3
Symposium, Conference and Workshop	23	50
TOTAL STUDENTS ATTENDED	87	-



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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

Criteria 2

Teaching-Learning and Evaluation

350

Key Indicator- 2.3. Teaching- Learning Process (40)

2021-2022

**ELECTRONICS AND
COMMUNICATION ENGINEERING**

PARTICIPATIVE LEARNING

VALUE ADDED COURSE



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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2021-2022/ODD SEMESTER

DEPARTMENT CIRCULAR

Date: 30.07.2021

Value Added Course offered by the Department of ECE will be conducted for Second, Third and Final year students on “**Fundamentals of MATLAB and its Uses**” in association with Marcello tech from 09.08.2021 to 13.08.2021. Certificates will be issued to the eligible participants at the end of the course.

S.No	Name of the Course	Resource Person
1	Fundamentals of MATLAB and its Uses	Er.C.MURUGAN, Senior Project Engineer, Marcello Tech, Ground Floor, Gem Plaza, No-3, SRC College Near, Sankaran Pillai Road, Tiruchirappalli, Tamil Nadu 620002 Mail.Id: info@marcellotech.com

Cc:

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


HoD/ECE

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

ACADEMIC YEAR 2021-2022/ODD SEMESTER

Value Added Course on “Fundamentals of Matlab and its Uses”

SYLLABUS

S.NO	TOPIC COVERED	DURATION (in hours)	DATE
1	Introduction to Matlab , Overview and Installation setup – Variables, Numbers, Operators, Expressions	3	9.8.2021
2	Input and output Vectors, Arrays – Matrices	3	9.8.2021
3	Built-in Functions User defined Functions	3	10.8.2021
4	Files and File Management – Import/Export Basic 2D, 3D plots, Graphic handling.	3	10.8.2021
5	Conditional Statements, Loops, MATLAB Programs – Programming and Debugging.	3	11.8.2021
6	Managing workspace and file commands, Predefined variables and math constants.	3	11.8.2021
7	Mathematical Computing with MATLAB Algebraic equations, Basic Symbolic Calculus and Differential equations, Numerical Techniques and Transforms	3	12.8.2021
8	Numbers and Strings	3	12.8.2021
9	Data Import and Project	3	13.8.2021
10	Applications of MATLAB Programming.	3	13.8.2021
Total Hours		30	


VAC Coordinator


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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR ODD SEMESTER (2021-2022)

STUDENT PARTICIPATION LIST FOR VALUE ADDED PROGRAM

Fundamentals of MATLAB and its Uses

S.NO	REG.NO	NAME	YEAR & BRANCH
1	912620106001	ABIRAMI S	II & ECE
2	912620106002	ANUSHYA M	II & ECE
3	912620106003	ARTHI S	II & ECE
4	912620106004	JEYASRI K	II & ECE
5	912620106006	SENPAGAHARINI V	II & ECE
6	912620106007	SONIYA P	II & ECE
7	912620106301	ABITHA S	II & ECE
8	912620106302	DESIKA G	II & ECE
9	912620106303	SABAREESWARI S	II & ECE
10	912620106304	SUBBULAKSHMI P	II & ECE
11	912619106001	AASHIMA M	III & ECE
12	912619106002	ANANTHI P	III & ECE
13	912619106004	JAFFARNISHA R	III & ECE
14	912619106005	MAHESWARI K	III & ECE
15	912619106006	MANISHA S	III & ECE
16	912619106007	MEGAVADHANA A	III & ECE
17	912619106008	PRIYANGA R	III & ECE
18	912619106009	RAGAVI V	III & ECE
19	912619106010	RAJAPRABA M	III & ECE
20	912619106011	SASIKA K	III & ECE
21	912618106001	ANUSHAA S	IV & ECE
22	912618106002	ARIVARASI A	IV & ECE
23	912618106003	ASMATH HAZEENA N	IV & ECE
24	912618106004	ATCHAYA R	IV & ECE
25	912618106005	JAYAPRIYA T	IV & ECE
26	912618106006	JAYASRI M	IV & ECE
27	912618106007	NAGALAKSHMI P	IV & ECE


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S.NO	REG.NO	NAME	YEAR & BRANCH
28	912618106008	NAVITHRA D	IV & ECE
29	912618106009	ROHINI K	IV & ECE
30	912618106010	SOUNTHARYA P	IV & ECE
31	912618106012	THAIYAL NAYAGI K	IV & ECE
32	912618106701	JANANI.R	IV & ECE


VAC - Cobrdinator


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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING ACADEMIC YEAR ODD SEMESTER (2021-2022)

ATTENDANCE SHEET FOR VALUE ADDED PROGRAM - FUNDAMENTALS OF MATLAB AND ITS USES

S.No	REG. NO	NAME	YEAR/ BRANCH	9.8.2021		10.8.2021		11.8.2021		12.08.2021		13.08.2021		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	912620106001	ABIRAMI S	II/ECE	/	/	/	/	/	/	/	/	/	/	10	S. Arif
2	912620106002	ANUSHYA M	II/ECE	/	/	/	/	/	/	/	/	/	/	10	m. Anushya
3	912620106003	ARTHI S	II/ECE	a	/	/	/	/	/	/	/	/	/	9	S. Arthi
4	912620106004	JEYASRI K	II/ECE	/	/	/	/	/	/	/	/	/	/	10	K. Jeyasri
5	912620106006	SENPAGAHARINI V	II/ECE	a	/	/	/	/	/	/	/	/	/	9	V. Maheshwari
6	912620106007	SONIYA P	II/ECE	/	/	/	/	/	/	a	/	/	/	9	P. Soniya
7	912620106301	ABITHA S	II/ECE	/	/	/	/	/	/	/	/	/	/	10	Abi S
8	912620106302	DESIKA G	II/ECE	/	/	a	/	/	/	/	/	/	/	9	G. Desika
9	912620106303	SABAREESWARI S	II/ECE	/	/	/	/	/	/	/	/	/	/	10	S. Sabareeswari
10	912620106304	SUBBULAKSHMI P	II/ ECE	a	a	/	/	/	/	/	/	/	/	8	S. Subbulakshmi
11	912619106001	AASHIMA M	III/ECE	/	/	/	/	/	/	/	/	/	/	10	Aasha
12	912619106002	ANANTHI P	III/ECE	/	/	/	/	/	/	/	/	/	/	10	R. Ananthi
13	912619106004	JAFFARNISHA R	III/ECE	/	/	/	/	/	/	/	/	/	/	10	R. Jaffarnisha
14	912619106005	MAHESWARI K	III/ECE	/	/	/	/	/	/	/	/	/	/	8	Maheswari

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15	912619106006	MANISHA S	III/ECE	/	/	/	/	/	/	/	/	/	/	/	10	S.K.J
16	912619106007	MEGAVADHANA A	III/ECE	/	/	/	/	/	/	/	/	/	/	/	10	A.A.A
17	912619106008	PRIYANGA R	III/ECE	/	/	/	/	/	/	/	/	/	/	/	10	R.R
18	912619106009	RAGAVI V	III/ECE	/	/	/	/	/	/	/	/	/	/	/	10	R.V.
19	912619106010	RAJAPRABA M	III/ECE	/	/	/	/	/	/	/	/	/	/	/	10	R.M.
20	912619106011	SASIKA K	III/ECE	/	/	/	/	/	/	/	/	/	/	/	10	R.K.
21	912618106001	ANUSHAA S	IV/ECE	/	/	/	/	/	/	/	/	/	/	/	10	A.S.
22	912618106002	ARIVARASI A	IV/ECE	/	/	/	/	/	/	/	/	/	/	/	10	A.A.
23	912618106003	ASMATH HAZEENA N	IV/ECE	/	/	/	/	/	/	/	/	/	/	/	10	A.H.N.
24	912618106004	ATCHAYA R	IV/ECE	/	/	/	/	/	/	/	/	/	/	/	10	A.R.
25	912618106005	JAYAPRIYA T	IV/ECE	/	/	/	/	/	/	/	/	/	/	/	10	J.T.
26	912618106006	JAYASRI M	IV/ECE	/	/	/	/	/	/	/	/	/	/	/	10	J.M.
27	912618106007	NAGALAKSHMI P	IV/ECE	/	/	/	/	/	/	/	/	/	/	/	10	N.P.
28	912618106008	NAVITHRA D	IV/ECE	a	a	/	/	/	/	/	/	/	/	/	8	N.D.
29	912618106009	ROHINI K	IV/ECE	/	/	/	/	/	/	/	/	/	/	/	10	R.K.
30	912618106010	SOUNTHARYA P	IV/ECE	/	/	/	/	/	/	/	/	/	/	/	10	S.P.
31	912618106012	THAIYAL NAYAGI K	IV/ECE	/	/	/	/	/	/	/	/	/	/	/	10	T.N.K.
32	912618106701	JANANI.R	IV/ECE	/	/	a	/	/	/	/	/	/	/	/	9	J.R.

VAC

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

Report on Value Added Course

Title: Fundamentals of MATLAB and its Uses

Resource Person: **Er.C.MURUGAN,**
Senior Project Engineer,
Marcello Tech,
Trichy- 620 002.

Date of conduct from : **9.8.2021** To: **13.8.2021** Duration: **30 Hours**

Organized Department : **Electronics and Communication Engineering**

Participant Year: **2/ 3 /4** Semester: **ODD** No. of Students Registered : **32**

Venue: **Seminar Hall, ,Ground Floor, SBECW**

Outcome of Value Added Course (VAC) :At the end of Course ,Students can able to

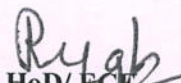
- Learn features of MATLAB as a programming tool. They are fully familiar to all the features of MATLAB software and easily handle the software.
- Develop programming skills and technique to solve mathematical problems.
- Learn graphic features of MATLAB and they are able to use this feature effectively in the various applications.
- Use MATLAB as a simulation tool.
- Work as a 'MATLAB programmer' in the industry.
- Will helps students to get the jobs in future.

No. of students successfully completed the VAC course is **32 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 VAC course conducted
- Total Score = $(0.5 * \text{Attendance in VAC out of 100 percentage} + 0.5 * \text{Test mark in VAC out of 100 marks})$


VAC Coordinator


HoD/ ECE
HOD / ECE


Principal

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Name of the Student :

Year/Sem:

AU Register Number:

Value Added Course on “Fundamental of MATLAB and its Uses”

MCQ QUESTIONS (20X1 = 20 Marks)

1. What does MATLAB stand for?
 - a) Math Analysis Language Tool
 - b) Matrix Analysis Language Tool
 - c) Mathematical Analysis Language
 - d) Matrix Laboratory
2. Which Command In Matlab Is Used To Create A New Variable?
 - a) new
 - b) var
 - c) create
 - d) let
3. What Is The Default Extension Of A Matlab Script File?
 - a) .mat
 - b) .m
 - c) .md
 - d) .txt
4. Which Of The Following Statements Is Used To Create A For Loop In Matlab?
 - a) while
 - b) do-while
 - c) for
 - d) repeat-until
5. Which Of The Following Commands Is Used To Create A Matrix With All Elements Set To 0?
 - a) zeros
 - b) ones
 - c) eye
 - d) rand
6. Which command in MATLAB is used to create a plot?
 - a) plot
 - b) createplot
 - c) drawplot
 - d) makeplot
7. Which of the following commands is used to calculate the dot product of two vectors in MATLAB?
 - a) dot
 - b) cross
 - c) inner
 - d) product
8. The functioning of all() and any() is same.
 - a) True
 - b) False
9. What will be the output of the following code?

```
all([1 0])
```

 - a) 1
 - b) 0
 - c) Error
 - d) None of these


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10. Choose the correct hierarchy of operations.

- a) |,&,+,-
- b) +,-,&,|
- c) :,+,-,&
- d) |, :,&.,^

11. The if-else structure does not allow _____

- a) Return statement
- b) End statement
- c) Endif statement
- d) Break statement

12. Before starting a new case, we have to end the previous case using _____

- a) Break statement
- b) Continue statement
- c) Return statement
- d) No statement

13. The continue statement can be used in a switch-case structure.

- a) True
- b) False

14. We cannot use a _____ statement if the if-else structure is not part of a loop.

- a) continue
- b) if-else
- c) clc
- d) plot()

15. Digital systems _____ in Simulink.

- a) Can be implemented
- b) Cannot be implemented
- c) Only ADC's
- d) Only DAC's

16. The no. of logical operations present in the logical operator block is _____

- a) 6
- b) 7
- c) 5
- d) 3

17. The limits of the graph obtained from the scope can be changed from the _____

- a) Configuration properties
- b) Style option
- c) Layout option
- d) Stepping option

18. The clipboard function cannot work without

- a) Python
- b) C
- c) JAVA
- d) Not present in MATLAB

19. What is the output of the following code?

```
clipboard('copy','poe')
```

- a) Logical Error
- b) Copies 'poe'
- c) Copies poe
- d) Syntactical Error

20. What is the output of the following code?

```
system('date')
```

- a) Shows the date in your system
- b) Shows the actual date
- c) Shows the date when MATLAB was installed
- d) Error


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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Academic Year 2021-2022/ODD Semester

Value Added Course on **Fundamentals of MATLAB and its uses**

MCQ ANSWER KEY

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

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Name of the Student : Arthi . S

Year/Sem: II / III

AU Register Number: 912620106003

Value Added Course on “Fundamental of MATLAB and its Uses”

MCQ QUESTIONS (20X1 = 20 Marks)

1. What does MATLAB stand for?
a) Math Analysis Language Tool
b) Matrix Analysis Language Tool
c) Mathematical Analysis Language
d) Matrix Laboratory
2. Which Command In Matlab Is Used To Create A New Variable?
a) new
b) var
c) create
d) let
3. What Is The Default Extension Of A Matlab Script File?
a) .mat
b) .m
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d) .txt
4. Which Of The Following Statements Is Used To Create A For Loop In Matlab?
a) while
b) do-while
c) for
d) repeat-until
5. Which Of The Following Commands Is Used To Create A Matrix With All Elements Set To 0?
a) zeros
b) ones
c) eye
d) rand
6. Which command in MATLAB is used to create a plot?
a) plot
b) createplot
c) drawplot
d) makeplot
7. Which of the following commands is used to calculate the dot product of two vectors in MATLAB?
a) dot
b) cross
c) inner
d) product
8. The functioning of all() and any() is same.
a) True
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9. What will be the output of the following code?
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a) 1
b) 0
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15
20



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10. Choose the correct hierarchy of operations.

a) |, &, +, -
b) /, -, &, |

c) :, +, -, &
d) |, :, &, ^

11. The if-else structure does not allow _____

a) Return statement
b) End statement

c) Endif statement
d) Break statement

12. Before starting a new case, we have to end the previous case using _____

a) Break statement
b) Continue statement

c) Return statement
d) No statement

13. The continue statement can be used in a switch-case structure.

a) True

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14. We cannot use a _____ statement if the if-else structure is not part of a loop.

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c) 5
d) 3

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d) Stepping option

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a) Python
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19. What is the output of the following code?

```
clipboard('copy', 'poe')
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a) Logical Error
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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

Name of the Student : Maheswari.K

Year/Sem: III / V

AU Register Number: 912619106005

Value Added Course on "Fundamental of MATLAB and its Uses"

MCQ QUESTIONS (20X1 = 20 Marks)

1. What does MATLAB stand for?
 - a) Math Analysis Language Tool
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 - c) drawplot
 - d) makeplot
7. Which of the following commands is used to calculate the dot product of two vectors in MATLAB?
 - a) dot
 - b) cross
 - c) inner
 - d) product
8. The functioning of all() and any() is same.
 - a) True
 - b) False
9. What will be the output of the following code?
all([1 0])
 - a) 1
 - b) 0
 - c) Error
 - d) None of these


Dr. S. THILAGAVATHI M.E., Ph.D.,
PRINCIPAL
SRI BHARATHI ENGINEERING
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13
20
[Signature]



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10. Choose the correct hierarchy of operations.

- a) |,&,+,-
b) +,-,&|
c) :,+,-,&
d) |, :,&,.^

11. The if-else structure does not allow _____

- a) Return statement
b) End statement
c) Endif statement
d) Break statement

12. Before starting a new case, we have to end the previous case using _____

- a) Break statement
b) Continue statement
c) Return statement
d) No statement

13. The continue statement can be used in a switch-case structure.

- a) True
b) False

14. We cannot use a _____ statement if the if-else structure is not part of a loop.

- a) continue
b) if-else
c) clc
d) plot()

15. Digital systems _____ in Simulink.

- a) Can be implemented
b) Cannot be implemented
c) Only ADC's
d) Only DAC's

16. The no. of logical operations present in the logical operator block is _____

- a) 6
b) 7
c) 5
d) 3

17. The limits of the graph obtained from the scope can be changed from the _____

- a) Configuration properties
b) Style option
c) Layout option
d) Stepping option

18. The clipboard function cannot work without

- a) Python
b) C
c) JAVA
d) Not present in MATLAB

19. What is the output of the following code?

`clipboard('copy','poe')`

- a) Logical Error
b) Copies 'poe'
c) Copies poe
d) Syntactical Error

20. What is the output of the following code?

`system('date')`

- a) Shows the date in your system installed
b) Shows the actual date
c) Shows the date when MATLAB was installed
d) Error

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

Name of the Student : P. Sountharya

Year/Sem: IV / VII

AU Register Number: 912618106010

14
20

Value Added Course on “Fundamental of MATLAB and its Uses”

MCQ QUESTIONS (20X1 = 20 Marks)

1. What does MATLAB stand for?
a) Math Analysis Language Tool
b) Matrix Analysis Language Tool
c) Mathematical Analysis Language
 d) Matrix Laboratory
2. Which Command In Matlab Is Used To Create A New Variable?
a) new
b) var
c) create
d) let
3. What Is The Default Extension Of A Matlab Script File?
a) .mat
b) .m
c) .md
d) .txt
4. Which Of The Following Statements Is Used To Create A For Loop In Matlab?
a) while
b) do-while
c) for
d) repeat-until
5. Which Of The Following Commands Is Used To Create A Matrix With All Elements Set To 0?
a) zeros
b) ones
c) eye
d) rand

6. Which command in MATLAB is used to create a plot?
a) plot
b) createplot
c) drawplot
d) makeplot

7. Which of the following commands is used to calculate the dot product of two vectors in MATLAB?
a) dot
b) cross
c) inner
d) product

8. The functioning of all() and any() is same.
 a) True
b) False

9. What will be the output of the following code?
all([1 0])
a) 1
b) 0
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d) None of these

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10. Choose the correct hierarchy of operations,

- a) |,&,+,-
 b) +,-,&,|

- c) :,+,-,&
d) |, :,&,.^

11. The if-else structure does not allow _____

- a) Return statement
b) End statement

- c) Endif statement
d) Break statement

12. Before starting a new case, we have to end the previous case using _____

- a) Break statement
b) Continue statement

- c) Return statement
 d) No statement

13. The continue statement can be used in a switch-case structure.

- a) True

- b) False

14. We cannot use a _____ statement if the if-else structure is not part of a loop.

- a) continue
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- c) clc
d) plot()

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18. The clipboard function cannot work without

- a) Python
b) C

- c) JAVA
d) Not present in MATLAB

19. What is the output of the following code?

```
clipboard('copy',poe)
```

- a) Logical Error
b) Copies 'poe'

- c) Copies poe
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20. What is the output of the following code?

```
system('date')
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- a) Shows the date in your system installed
b) Shows the actual date

- c) Shows the date when MATLAB was installed
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR ODD SEMESTER (2021-2022)

MARK SHEET FOR VALUE ADDED COURSE- FUNDAMENTALS OF MATLAB AND ITS USES

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 Attended	Marks (100)	No.of Correct Answer	Marks (100)	
1	912620106001	ABIRAMI S	II /ECE	10	100	18	90	95
2	912620106002	ANUSHYA M	II /ECE	10	100	13	65	83
3	912620106003	ARTHI S	II /ECE	9	90	15	75	83
4	912620106004	JEYASRI K	II /ECE	10	100	16	80	90
5	912620106006	SENPAGAHARINI V	II /ECE	9	90	15	75	83
6	912620106007	SONIYA P	II /ECE	9	90	15	75	83
7	912620106301	ABITHA S	II/ECE	10	100	19	95	98
8	912620106302	DESIKA G	II/ECE	9	90	14	70	80
9	912620106303	SABAREESWARI S	II/ECE	10	100	18	90	90
10	912620106304	SUBBULAKSHMI P	II/ECE	8	80	13	65	73
11	912619106001	AASHIMA M	III /ECE	10	100	17	85	93
12	912619106002	ANANTHI P	III /ECE	10	100	13	65	83
13	912619106004	JAFFARNISHA R	III /ECE	10	100	14	70	85
14	912619106005	MAHESWARI K	III /ECE	8	80	13	65	73

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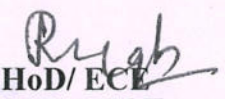
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15	912619106006	MANISHA S	III /ECE	10	100	16	80	90
16	912619106007	MEGAVADHANA A	III /ECE	10	100	13	65	83
17	912619106008	PRIYANGA R	III /ECE	10	100	14	70	85
18	912619106009	RAGAVI V	III /ECE	10	100	19	95	98
19	912619106010	RAJAPRABA M	III /ECE	10	100	18	90	95
20	912619106011	SASIKA K	III /ECE	10	100	16	80	90
21	912618106001	ANUSHAA S	IV /ECE	10	100	14	60	80
22	912618106002	ARIVARASI A	IV /ECE	10	100	18	90	95
23	912618106003	ASMATH HAZEENA N	IV /ECE	10	100	14	70	85
24	912618106004	ATCHAYA R	IV/ECE	10	100	12	60	80
25	912618106005	JAYAPRIYA T	IV /ECE	10	100	15	75	88
26	912618106006	JAYASRI M	IV /ECE	10	100	18	90	95
27	912618106007	NAGALAKSHMI P	IV /ECE	10	100	16	80	90
28	912618106008	NAVITHRA D	IV /ECE	8	80	19	95	88
29	912618106009	ROHINI K	IV /ECE	10	100	12	60	80
30	912618106010	SOUNTHARYA P	IV /ECE	10	100	14	60	80
31	912618106012	THAIYAL NAYAGI K	IV /ECE	10	100	13	65	83
32	912618106701	JANANI.R	IV /ECE	9	90	15	75	83


VAC Coordinator


Dr. S.THILAGAVATHI M.E., Ph.D.,
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KAIKKURICHI,



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Kaikkurichi, Pudukottai - 622 303.



MARCELLO TECH



CERTIFICATE

OF COMPLETION

This is certify that Mr./Ms./Mrs. **ANUSHYA M, II Yr / ECE** of

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

has successfully completed Five Days Value Added Course on "**Fundamentals of MATLAB and its Uses**" organized by the **Department of Electronics and Communication Engineering**, Sri Bharathi Engineering College for Women, Pudukottai in association with **Marcellotech** from **09.08.2021** to **13.08.2021**

S. Anudairi

MANAGER



[Handwritten Signature]

Dr S.THILAGAVATHI M.E.,Ph.D.,
PRINCIPAL

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Kaikkurichi - 622 303, Pudukottai Dt.**

[Handwritten Signature]

HOD - ECE



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MARCELLO TECH



CERTIFICATE

OF COMPLETION

This is certify that Mr./Ms./Mrs. **RAJAPRABA M, III Yr / ECE** of

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

has successfully completed Five Days Value Added Course on "**Fundamentals of MATLAB and its Uses**" organized by the **Department of Electronics and Communication Engineering , Sri Bharathi Engineering College for Women, Pudukottai in association with Marcellotech from 09.08.2021 to 13.08.2021**

S. Arudaini

MANAGER



[Signature]
Dr S.THILAGAVATHI M.E.,Ph.D.,
PRINCIPAL
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Kaikkurichi - 622 303, Pudukkottai Dt.

[Signature]

HOD - ECE



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MARCELLO TECH



CERTIFICATE

OF COMPLETION

This is certify that Mr./Ms./Mrs. ANUSHAA S, IV Yr / ECE of
SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

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S. Anudairi

MANAGER



[Signature]

Dr. S. THILAGAVATHI M.E., Ph.D.

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COLLEGE FOR WOMEN**

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HOD - ECE



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING ACADEMIC YEAR 2021-2022/EVEN SEMESTER

DEPARTMENT CIRCULAR

Date: 21.02.2022

Certificate Course offered by the Department of ECE will be conducted for all Second, Third and Final year students on “**Different Methodologies for IC Design**” in our college campus from 07.03.2022 to 11.03.2022. Certificates will be issued to the eligible participants at the end of the course.

S.No	Name of the Course	Resource Person
1	Different Methodologies for IC Design	1.Mrs.V.NITHYAPOORANI, Assistant Professor/ECE, Department of ECE.
		2.Mr.C.PALANIYAPPAN, Assistant Professor/ECE, Department of ECE.

Cc:

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


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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR 2021-2022/EVEN SEMESTER

Certificate Course on “Different Methodologies for IC Design”

SYLLABUS

S.NO	TOPIC COVERED	DURATION (in hours)	DATE	RESOURCE PERSON
1	Integration Scales and Applications	3	7.03.2022	Mrs.V.Nithyapoorani
2	Device Modelling for Digital ICs MOSFETs Layout and fabrication related topics.	3	7.03.2022	Mr.C.Palaniyappan
3	The Inverter CMOS: DC and transient characteristics.	3	8.03.2022	Mr.C.Palaniyappan
4	Basic Logic Families - CMOS Logic Circuits - Combinational logic gates- Dynamic circuits and clocking	3	8.03.2022	Mrs.V.Nithyapoorani
5	Digital Logic Units	3	9.03.2022	Mrs.V.Nithyapoorani
6	Sequential design and timing	3	9.03.2022	Mr.C.Palaniyappan
7	Arithmetic logic circuits	3	10.03.2022	Mrs.V.Nithyapoorani
8	Memories Cells and Arrays: SRAMs, DRAMs	3	10.03.2022	Mr.C.Palaniyappan
9	Applications to Practical Design Problems	3	11.03.2022	Mr.C.Palaniyappan
10	Examples from current literature including microprocessors, control systems, and signal processing.	3	11.03.2022	Mrs.V.Nithyapoorani
Total Hours			30	


Course Coordinator


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

DEPARTMENT OF ELECTRONICS AN COMMUNICATIONENGINEERING
ACADEMIC YEAR EVEN SEMESTER (2021-2022)

STUDENT PARTICIPATION LIST FOR CERTIFICATE COURSE PROGRAM

Different Methodologies for IC Design

S.NO	REG.NO	NAME	YEAR & BRANCH
1	912620106001	ABIRAMI S	II & ECE
2	912620106002	ANUSHYA M	II & ECE
3	912620106003	ARTHI S	II & ECE
4	912620106004	JEYASRI K	II & ECE
5	912620106006	SENPAGAHARINI V	II & ECE
6	912620106007	SONIYA P	II & ECE
7	912620106301	ABITHA S	II & ECE
8	912620106302	DESIKA G	II & ECE
9	912620106303	SABAREESWARI S	II & ECE
10	912620106304	SUBBULAKSHMI P	II & ECE
11	912619106001	AASHIMA M	III & ECE
12	912619106002	ANANTHI P	III & ECE
13	912619106004	JAFFARNISHA R	III & ECE
14	912619106005	MAHESWARI K	III & ECE
15	912619106006	MANISHA S	III & ECE
16	912619106007	MEGAVADHANA A	III & ECE
17	912619106008	PRIYANGA R	III & ECE
18	912619106009	RAGAVI V	III & ECE
19	912619106010	RAJAPRABA M	III & ECE
20	912619106011	SASIKA K	III & ECE
21	912618106001	ANUSHAA S	IV& ECE
22	912618106002	ARIVARASI A	IV& ECE
23	912618106003	ASMATH HAZEENA N	IV& ECE
24	912618106004	ATCHAYA R	IV& ECE
25	912618106005	JAYAPRIYA T	IV& ECE
26	912618106006	JAYASRI M	IV& ECE
27	912618106007	NAGALAKSHMI P	IV& ECE

D.S. THILAGAVATHI M.E., Ph.D.,

PRINCIPAL

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Kaikkurichi - 622 303, Pudukkottai, Dt.

S.NO	REG.NO	NAME	YEAR & BRANCH
28	912618106008	NAVITHRA D	IV& ECE
29	912618106009	ROHINI K	IV& ECE
30	912618106010	SOUNTHARYA P	IV& ECE
31	912618106012	THAIYAL NAYAGI K	IV& ECE
32	912618106701	JANANI.R	IV& ECE


Course Coordinator


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Dr. S.THILAGAVATHI M.E., Ph.D.,
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING
ACADEMIC YEAR EVEN SEMESTER (2021-2022)

ATTENDANCE SHEET FOR CERTIFICATE COURSE PROGRAM-DIFFERENT METHODOLOGIES FOR IC DESIGN

S.No	REG. NO	NAME	YEAR/ BRANCH	07.3.2021		8.3.2021		9.3.2021		10.03.2021		11.03.2021		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	912620106001	ABIRAMI S	II/ECE	/	/	/	/	/	/	/	/	/	/	10	S. Anji
2	912620106002	ANUSHYA M	II/ECE	/	/	/	/	/	/	/	/	/	/	10	M. Anushya
3	912620106003	ARTHI S	II/ECE	/	/	/	/	/	/	/	/	/	/	10	S. Arthi
4	912620106004	JEYASRI K	II/ECE	/	/	a	a	/	/	/	/	/	/	8	K. Jeyasri
5	912620106006	SENPAGAHARINI V	II/ECE	/	/	/	/	/	/	/	/	/	/	10	N. Shreya
6	912620106007	SONIYA P	II/ECE	/	/	/	/	/	/	/	/	/	/	10	P. Soniya
7	912620106301	ABITHA S	II/ECE	/	/	/	/	/	/	/	/	/	/	10	Abitha S
8	912620106302	DESIKA G	II/ECE	/	/	/	/	/	/	a	/	/	/	9	Desika
9	912620106303	SABAREESWARI S	II/ECE	/	/	/	/	/	/	/	/	/	/	10	S. Sabari
10	912620106304	SUBBULAKSHMI P	II/ECE	a	a	/	/	/	/	/	/	/	/	8	Subbula
11	912619106001	AASHIMA M	III/ECE	/	/	/	/	/	/	/	/	/	/	10	Aashima
12	912619106002	ANANTHI P	III/ECE	/	/	/	/	/	/	a	/	/	/	9	Ananthi
13	912619106004	JAFFARNISHA R	III/ECE	/	/	/	/	/	/	a	a	/	/	8	R. Jaffar
14	912619106005	MAHESWARI K	III/ECE	/	/	/	/	/	/	/	/	/	/	10	Maheswari
15	912619106006	MANISHA S	III/ECE	/	/	/	/	/	/	/	/	/	/	10	S. Manisha

Dr. S. THILAGAVATHI, M.E., Ph.D.,
PRINCIPAL

SRI BHARATHI ENGINEERING
COLLEGE FOR WOMEN

16	912619106007	MEGAVADHANA A	III/ECE	a	/	/	/	/	/	/	/	/	/	9	Amo A
17	912619106008	PRIYANGA R	III/ECE	/	/	/	/	/	/	/	/	/	/	10	R.B
18	912619106009	RAGAVI V	III/ECE	/	/	/	/	/	/	a	a	/	/	8	Rt
19	912619106010	RAJAPRABA M	III/ECE	/	/	/	/	/	/	/	/	/	/	10	M.T.P
20	912619106011	SASIKA K	III/ECE	/	/	/	/	/	/	/	/	/	/	10	f.p.d.
21	912618106001	ANUSHAA S	IV/ECE	/	/	/	/	/	/	/	/	/	/	10	Amsha.
22	912618106002	ARIVARASI A	IV/ECE	/	/	/	/	/	/	/	/	/	/	10	Arivarasi. t
23	912618106003	ASMATH HAZEENA N	IV/ECE	/	/	a	a	/	/	/	/	/	/	8	Asmatha
24	912618106004	ATCHAYA R	IV/ECE	/	/	/	/	/	/	/	/	/	/	10	ATCHAYA R
25	912618106005	JAYAPRIYA T	IV/ECE	/	/	/	/	/	/	a	a	/	/	8	Jayapriya
26	912618106006	JAYASRI M	IV/ECE	/	/	a	a	/	/	/	/	/	/	8	Jayasri
27	912618106007	NAGALAKSHMI P	IV/ECE	/	/	/	/	/	/	/	/	/	/	10	Nagla
28	912618106008	NAVITHRA D	IV/ECE	/	/	/	/	/	/	/	/	/	/	10	Navithra
29	912618106009	ROHINI K	IV/ECE	/	/	/	/	/	/	a	/	/	/	9	Rohini
30	912618106010	SOUNTHARYA P	IV/ECE	/	/	/	/	/	/	/	/	/	/	10	Sountharya
31	912618106012	THAIYAL NAYAGI K	IV/ECE	/	/	/	/	/	/	/	/	/	/	10	Thaiyal Nayagi
32	912618106701	JANANI.R	IV/ECE	/	/	/	/	/	/	/	/	/	/	10	Janani.R

V. N. N. N.
Course Coordinator

Dr. S. THILAGAVATHI M.E., Ph.D.,
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R. N. N.
HOD / ECE
SRI BHARATHI ENGINEERING
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PUDUKKOTTAI - 622 303

SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

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

Report on Certificate Course

Title: Different Methodologies for IC Design

Resource Person:

1.Mrs.V.NITHYAPOORANI,
Assistant Professor/ECE.

2.Mr.C.PALANIYAPPAN,
Assistant Professor/ECE.

Date of conduct from : 7.3.2022

To: 11.3.2022

Duration:

30 Hours

Organized Department :

Electronics and Communication Engineering

Participant Year: 2/ 3 /4

Semester:

ODD

No. of Students Registered :

32

Venue:

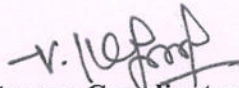
Seminar Hall, ,Ground Floor, SBECW

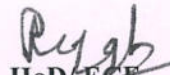
Outcome of Certificate Course (CC) :At the end of Course ,Students can able to

- Analyze functionality of digital circuits including combinational, sequential, and memory
- Characterize speed, energy consumption, and robustness of combinational, sequential, and memory circuits.
- Design combinational, sequential, and memory circuits to meet specified functionality, speed, energy, and robustness targets
- Perform simulation of digital circuits, and write reports conforming to technical writing standards.
- Understand EDA tool design flow for digital IC design.
- No. of students successfully completed the certificate course is **32 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
HOD / ECE

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PUDUKKOTTAI - 622 303.


Principal

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

Name of the Student :

Year/Sem:

AU Register Number:

Certificate Course on “Different Methodologies For IC Design”

MCQ QUESTIONS (25X1 = 25 Marks)

1. An IC contains-----
 - a) Passive elements
 - b) Active elements
 - c) Both Passive and active elements
 - d) None of the above
2. The most complicated component fabricated on IC is -----?
 - a) Diode
 - b) Resistor
 - c) Transistor
 - d) Conductor.
3. The bottom layer of an IC serves as?
 - a) Connector layer
 - b) Insulating layer
 - c) Substrate
 - d) None of the above
4. All the active and passive elements are grown on the-----layer of the IC?
 - a) First substrate layer
 - b) The second layer which is a single crystal extension of the substrate
 - c) The SiO₂ layer
 - d) The Polysilicon layer
5. The substrate is typically of size-----?
 - a) 25 mils thick
 - b) 16 mils thick
 - c) 2 mils thick
 - d) 6 mils thick.
6. The second layer of IC is of ----- mils thickness?
 - a) 2
 - b) 1
 - c) 5
 - d) 0
7. The diffusion of impurities is done on the-----layer?
 - a) Substrate layer
 - b) Second layer
 - c) SiO₂ layer
 - d) All of the above
8. IC fabrication depends upon---?
 - a) Materials
 - b) process
 - c) design technologies
 - d) all the above
9. ----- protects the wafer from contamination due to impurities?
 - a) SiO₂ layer
 - b) Masks
 - c) Photo resist layer
 - d) Diffusion

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20. In base diffusion step -----impurities are diffused?
- a) p-type
b) n-type
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21. The resistivity of the base layer is----- the isolation region?
- a) Equal to
b) Lower than
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22. In emitter diffusion step----- are formed?
- a) Transistor
b) emitters
c) Resistors
d) Only a & c
23. Aluminum is a----- type impurity in a silicon
- a) N-type
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24. ----- prevents the formation of the p-n junction when aluminium is used for ohmic contact?
- a) A large concentration of phosphorus
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d) None of these
25. The interconnections are made during -----
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d) Metallization process


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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Academic Year 2021-2022/EVEN Semester

Certificate Course on **Different Methodologies for IC design**

MCQ ANSWER KEY

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

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10. Selective etching is done using-----?

- a) Diffusion process
- b) Photolithography process
- c) Metallization process
- d) Masking process

11. Usually, the substrate of IC is made up of-----

- a) Germanium
- b) metal
- c) Silicon SiO₂
- d) Aluminum.

12. The process of forming an IC on a single silicon chip is known as-----

- a) Single Process IC
- b) Monolithic IC
- c) Epitaxial IC
- d) All the above

13. The process of forming an IC on a single silicon chip is known as-----

- a) Independent of the substrate
- b) Dependent on the substrate
- c) Equal to that of the substrate
- d) Zero

14. Silicon dioxide helps the penetration of impurities.

- a) True
- b) False
- c) Partially
- d) All the above

15. Silicon dioxide helps the penetration of impurities.

- a) Different isolation regions
- b) Same isolation regions
- c) Epitaxial region
- d) Photoresist region

16. To make p-n junctions reverse biased, with respect to isolation region the p-type substrate must also be held at---?

- a) Zero
- b) Unity
- c) Positive potential
- d) Negative potential

17. While operating circuit, the isolation will be lost if the p-n junction is-----

- a) Reverse biased
- b) Forward biased
- c) Short circuited
- d) Open circuited

18. To prevent the connection between two isolation islands, the concentration of acceptor ions between isolation regions should be...?

- a) Zero
- b) Lower than that of the substrate
- c) Higher than that of the substrate
- d) Equal to that of the substrate.

19. Using base diffusion step----- are formed on IC?

- a) Transistor b) base regions Resistors
- c) Resistors d) All of the above

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- a) A large concentration of phosphorus
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25. The interconnections are made during -----

- a) Emitter diffusion process
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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

Name of the Student : Rajaprabam

Year/Sem: III / V

AU Register Number: 912619106010

Certificate Course on “Different Methodologies For IC Design”

MCQ QUESTIONS (25X1 = 25 Marks)

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d) All of the above
8. IC fabrication depends upon---?
- a) Materials
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9. ----- protects the wafer from contamination due to impurities?
- a) SiO₂ layer
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c) Photo resist layer
d) Diffusion

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Kaikkurichi, Pudukkottai, Tamil Nadu – 622 303, India

Name of the Student : *Thaiyal Nayagi . K* Year/Sem: *final year / VIII*

AU Register Number: *912618106012*

Certificate Course on “Different Methodologies For IC Design”

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19
25

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ACADEMIC YEAR EVEN SEMESTER (2021-2022)

MARK SHEET FOR CERTIFICATE COURSE- DIFFERENT METHODOLOGIES FOR IC DESIGN

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 Attended	Marks (100)	No.of Correct Answer	Marks (100)	
1	912620106001	ABIRAMI S	II /ECE	10	100	22	88	94
2	912620106002	ANUSHYA M	II /ECE	10	100	19	76	88
3	912620106003	ARTHI S	II /ECE	10	100	18	72	86
4	912620106004	JEYASRI K	II /ECE	8	80	20	80	80
5	912620106006	SENPAGAHARINI V	II /ECE	10	100	20	80	90
6	912620106007	SONIYA P	II /ECE	10	100	18	72	86
7	912620106301	ABITHA S	II /ECE	10	100	19	76	78
8	912620106302	DESIKA G	II /ECE	9	90	18	72	81
9	912620106303	SABAREESWARI S	II /ECE	10	100	18	72	86
10	912620106304	SUBBULAKSHMI P	II /ECE	8	80	17	68	74
11	912619106001	AASHIMA M	III /ECE	10	100	22	88	94
12	912619106002	ANANTHI P	III /ECE	9	90	19	76	83
13	912619106004	JAFFARNISHA R	III /ECE	8	80	18	72	76
14	912619106005	MAHESWARI K	III /ECE	10	100	19	76	88

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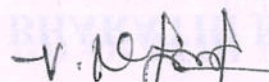


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15	912619106006	MANISHA S	III /ECE	10	100	22	88	94
16	912619106007	MEGAVADHANA A	III /ECE	9	90	18	72	81
17	912619106008	PRIYANGA R	III /ECE	10	100	19	76	88
18	912619106009	RAGAVI V	III /ECE	8	80	21	84	82
19	912619106010	RAJAPRABA M	III /ECE	10	100	23	92	96
20	912619106011	SASIKA K	III /ECE	10	100	21	84	92
21	912618106001	ANUSHAA S	IV /ECE	10	100	23	92	96
22	912618106002	ARIVARASI A	IV /ECE	10	100	19	76	88
23	912618106003	ASMATH HAZEENA N	IV /ECE	8	80	19	76	78
24	912618106004	ATCHAYA R	IV/ECE	10	100	18	72	86
25	912618106005	JAYAPRIYA T	IV /ECE	8	80	23	82	81
26	912618106006	JAYASRI M	IV /ECE	8	80	18	72	76
27	912618106007	NAGALAKSHMI P	IV /ECE	10	100	18	72	86
28	912618106008	NAVITHRA D	IV /ECE	10	100	19	76	88
29	912618106009	ROHINI K	IV /ECE	9	90	18	72	81
30	912618106010	SOUNTHARYA P	IV /ECE	10	100	20	80	90
31	912618106012	THAIYAL NAYAGI K	IV /ECE	10	100	19	76	88
32	912618106701	JANANI.R	IV /ECE	10	100	18	72	86


Course Coordinator


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HoD/ ECE
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KAIKKURICHI, PUDUKKOTTAI-622303

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE OF PARTICIPATION

This is to Certify that Mr/Ms. **ABIRAMIS** (Reg.No: **912620106001**), II ECE has successfully completed Certificate Course on “ Different Methodologies for IC Design” held at our college campus from 07.03.2022 to 11.03.2022 for the academic year 2021-2022.


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This is to Certify that Mr/Ms. **AASHIMA.M** (Reg.No: **912619106001**), **III ECE** has successfully completed Certificate Course on “ Different Methodologies for IC Design” held at our college campus from 07.03.2022 to 11.03.2022 for the academic year 2021-2022.


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Criteria 2

Teaching-Learning and Evaluation

350

Key Indicator- 2.3. Teaching- Learning Process (40)

2021-2022

**ELECTRONICS AND
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PARTICIPATIVE LEARNING

SYMPOSIUM, CONFERENCE WORKSHOP



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PARTICIPATIVE LEARNING (SYMPOSIUM/WORKSHOP/SEMINAR)

ACADEMIC YEAR 2021-2022

S.No	Register No	Student Name	Year/Sem	Name of the Learning Method (Participative learning)
1	912618106003	ASMATH HAZEENA N	IV/VIII	Symposium-Paper Presentation
2	912618106012	THAIYAL NAYAGI K		
3	912618106001	ANUSHAA S	IV/VIII	Symposium-Paper Presentation
4	912618106004	ATCHAYA R		
5	912618106003	ASMATH HAZEENA N	IV/VII	(Workshop -Artificial Intelligence) Galwin Technology, Trichy
6	912618106005	JAYAPRIYA T		
7	912618106010	SOUNTHARYA P		
8	912618106012	THAIYAL NAYAGI K		
9	912618106001	ANUSHAA S	IV/VII	Workshop -Centroid of Engineering in AL And ML
10	912618106003	ASMATH HAZEENA N		
11	912618106007	NAGALAKSHMI P		
9	912618106009	ROHINI K		
10	912618106010	SOUNTHARYA P	IV/VIII	Conference
11	912618106001	ANUSHAA S		
12	912618106002	ARIVARASI A		
13	912618106003	ASMATH HAZEENA N	III/V	(Workshop - VLSI design using open source EDA ,Trichy)
14	912619106001	AASHIMA M		
15	912619106002	ANANTHI P		
16	912619106004	JAFFARNISHA R		
17	912619106005	MAHESWARI K		
18	912619106006	MANISHA S		
19	912619106007	MEGAVADHANA A		
20	912619106008	PRIYANGA R		
21	912619106009	RAGAVI V		
22	912619106010	RAJAPRABA M		
23	912619106011	SASIKA K		


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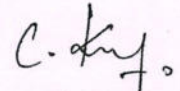


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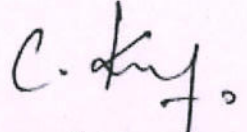
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OF PESTISIDES AND FERTILIZERS USING RASPBERRY PI & AI**

Volume 11, Issue 6, June 2022

DOI: 10.17148/IJARCCCE.2022.11678

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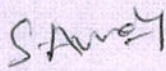
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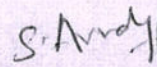
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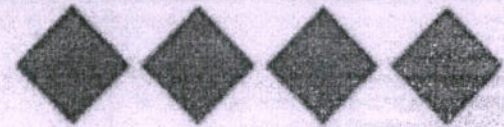
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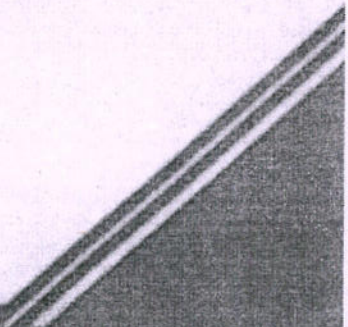
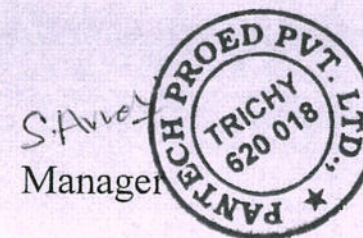
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