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 2021-2022 / 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:	**DIFFERENT METHODOLOGIES FOR IC DESIGN**				
Resource Person:	**Resource Person 1:** Mrs.V.Nithyapoorani, AP / ECE		**Resource Peron 2:** Mrs.R.Yogeshwari, AP / ECE		
Date of conduct from :	**07.3.2022**	**To:**	**11.3.2022**	**Duration:**	**30 Hours**
Organized Department :	**ELECTRONICS AND COMMUNICATION ENGINEERING**				
Participant Year:	**2/ 3 /4**	**Semester:**	**EVEN**	**No. of Students Registered :**	**32**
Venue:	**Seminar Hall, ,Ground Floor, SBECW**				

TABLE OF CONTENTS

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 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 to11.03.2022.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.

HoD/ECE

HOD / ECE
SRI BHARATHI ENGINEERING
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KAIKKURICHI,
PUDUKKOTTAI - 622 303

Cc:

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

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

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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

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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

Course Coordinator

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KAIKKURICHI, PUDUKKOTTAI-622 303

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.Abi
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. Jeya
5	912620106006	SENPAGAHARINI V	II/ECE	/	/	/	/	/	/	/	/	/	/	10	V. Shri
6	912620106007	SONIYA P	II/ECE	/	/	/	/	/	/	/	/	/	/	10	P. Soniya
7	912620106301	ABITHA S	II/ECE	/	/	/	/	/	/	/	/	/	/	10	Abi. S
8	912620106302	DESIKA G	II/ECE	/	/	/	/	/	/	a	/	/	/	9	G. Desi
9	912620106303	SABAREESWARI S	II/ECE	/	/	/	/	/	/	/	/	/	/	10	S. Sabari
10	912620106304	SUBBULAKSHMI P	II/ECE	a	a	/	/	/	/	/	/	/	/	8	Subb
11	912619106001	AASHIMA M	III/ECE	/	/	/	/	/	/	/	/	/	/	10	Aash.
12	912619106002	ANANTHI P	III/ECE	/	/	/	/	/	/	a	/	/	/	9	A. Anji.
13	912619106004	JAFFARNISHA R	III/ECE	/	/	/	/	/	/	a	a	/	/	8	R. Jaf
14	912619106005	MAHESWARI K	III/ECE	/	/	/	/	/	/	/	/	/	/	10	Mah
15	912619106006	MANISHA S	III/ECE	/	/	/	/	/	/	/	/	/	/	10	S. Man

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

Course Coordinator

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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** **Principal**

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE OF PARTICIPATION

This is to Certify that Mr/Ms. **ABIRAMI.S** (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.

COURSE COORDINATOR

PRINCIPAL

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

COURSE COORDINATOR

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

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

CERTIFICATE OF PARTICIPATION

This is to Certify that Mr/Ms. **JAYASRI.M** (Reg.No: **912618106006**), **IV** 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.

COURSE COORDINATOR

Dr. S.THILAGAVATHI M.E., Ph.D.,
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SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

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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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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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20. In base diffusion step ---------impurities are diffused?
    a) p-type
    b) n-type
    c) Both p & n-type
    d) None of the above.

21. The resistivity of the base layer is------- the isolation region?
    a) Equal to
    b) Lower than
    c) Higher than
    d) Reciprocal

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
    b) P-type
    c) Inert
    d) Metallic

24. ---------- prevents the formation of the p-n junction when aluminium is used for ohmic contact?
    a) A large concentration of phosphorus
    b) A large concentration of Silicon
    c) A large concentration of Polysilicon
    d) None of these

25. The interconnections are made during -------
    a) Emitter diffusion process
    b) Photolithography process
    c) Epitaxial growth
    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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Name of the Student : Sowya . P **Year/Sem:** II / IV

AU Register Number: 912620106007

Certificate Course on **"Different Methodologies For IC Design"**

18/25

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?
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8. IC fabrication depends upon---?
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   b) process
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9. ----- protects the wafer from contamination due to impurities?
   a) SiO2 layer
   b) Masks
   c) Photo resist layer
   d) Diffusion

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Name of the Student : Rajapraba.m **Year/Sem:** III / V

AU Register Number: 912619106010

Certificate Course on **"Different Methodologies For IC Design"**

23/25

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
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   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
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9. ----- protects the wafer from contamination due to impurities?
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Name of the Student : Thaiyal Nayagi . K **Year/Sem:** Final year / VIII

AU Register Number: 912618106012

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DEPARTMENT OF ELECTRONICS AND COMMUNICATIONENGINEERING

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 Attented	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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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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