1. **PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):**

I. Develop proficiency as a computer science engineer with an ability to solve a wide range of computational problems and have sustainable development in industry or any other work environment.

II. Analyze and adapt quickly to new environments and technologies, gather new information, and work on emerging technologies to solve multidisciplinary engineering problems.

III. Possess the ability to think analytically and logically to understand technical problems with computational systems for a lifelong learning which leads to pursuing research.

IV. Adopt ethical practices to collaborate with team members and team leaders to build technology with cutting-edge technical solutions for computing systems

V. Strongly focus on design thinking and critical analysis to create innovative products and become entrepreneurs.

2. **PROGRAM OUTCOMES (POs):**

1. An ability to independently carry out research / investigation and development work to solve practical problems.
2. An ability to write and present a substantial technical report/document.
3. Students should be able to demonstrate a degree of mastery over the area of Computer Science and Engineering.
4. Efficiently design, build and develop system application software for distributed and centralized computing environments in varying domains and platforms.
5. Understand the working of current Industry trends, the new hardware architectures, the software components and design solutions for real world problems by Communicating and effectively working with professionals in various engineering fields and pursue research orientation for a lifelong professional development in computer and automation arenas.
6. Model a computer based automation system and design algorithms that explore the understanding of the tradeoffs involved in digital transformation.

PEO/PO Mapping:

PEO	POs					
	PO1	PO2	PO3	PO4	PO5	PO6
I.	1	2	3	4	5	6
II.	3	2	3	3	3	3
III.	3	3	3	3	2	3
IV.	3	3	2	3	3	2
V.	1	2	3	2	2	2

Contribution 1: Reasonable 2: Significant 3: Strong

MAPPING OF COURSE OUTCOMES AND PROGRAMME OUTCOMES

			COURSE NAME	PO1	PO2	PO3	PO4	PO5	PO6
YEAR I	SEMESTER I	MA4151	Applied Probability and Statistics for Computer Science Engineers	2.00	1.67	2.00	2.00	2.00	2.00
		RM4151	Research Methodology and IPR	3.00	2.00	2.00	1.67	1.20	2.00
		CP4151	Advanced Data Structures and Algorithms	3.00	2.00	1.25	1.67	1.67	2.00
		CP4152	Database Practices	2.40	2.00	1.50	1.60	1.00	1.20
		CP4153	Network Technologies	1.00	2.80	2.20	1.75	1.50	1.50
		CP4154	Principles of Programming Languages	1.00	1.67	1.00	1.00	1.50	2.00
		CP4161	Advanced Data Structures and Algorithms Laboratory	1.00	1.50	1.75	1.40	2.00	1.00
	SEMESTER II	CP4291	Internet of Things	1.60	1.80	1.60	1.40	2.00	2.20
		CP4292	Multicore Architecture and Programming	1.80	1.00	1.50	1.25	1.60	2.20
		CP4252	Machine Learning	1.80	2.20	1.25	1.75	1.00	2.20
		SE4151	Advanced Software Engineering	2	2.75	2	2.4	2.67	2
		CP4211	Term Paper Writing and seminar						
		CP4212	Software Engineering Laboratory	2.5	2.5	2.25	2.5	2	2.34
YEAR II	SEMESTER III	CP4391	Security Practices	1.50	1.67	1.60	1.60	1.80	2.40
	SEMESTER IV	CP4411	Project Work II						

PROFESSIONAL ELECTIVE COURSES [PEC]

S. NO.	CODE	COURSE TITLE	PO1	PO2	PO3	PO4	PO5	PO6
1.	MP4092	Human Computer Interaction	2	2.75	2	2.4	2.67	2
2.	MP4251	Cloud Computing Technologies	2.6	2.5	2	2	1.5	2
3.	BD4151	Foundations of Data Science	1.75	1.5	2.7	3	2.5	2.5
4.	MP4152	Wireless Communications	2.5	2.7	2.7	2	3	2.75
5.	SE4071	Agile Methodologies	2.2	2	2.3	2.5	2.2	3
6.	CP4095	Performance Analysis of Computer Systems	1.6	1.75	2.2	1.33	2	1
7.	CP4001	Advanced Operating System	1.25	1.75	2.33	2	1.5	2
8.	MU4251	Digital Image Processing	2.4	2.3	2.5	2.4	2.3	3
9	BD4071	High Performance Computing for Big Data	1.75	1.5	2	2	2.25	3
10.	CP4093	Information Retrieval Techniques	1.6	1.6	1.8	2.6	2.2	2.4
11.	CP4096	Software Quality Assurance	2.2	1.8	1.8	2.8	1.6	2.4
12.	CP4091	Autonomous Systems	1.8	1.5	2.25	2	2	2
13.	CP4097	Web Analytics	2.2	2	3	1.6	1.8	1.4
14.	MP4091	Cognitive Computing	1.5	2.3	2	1.5	2	1.5
15.	AP4093	Quantum Computing	1.75	1.7	2.4	2	2	2.73
16.	BD4251	Big Data Mining and Analytics	1.5	3	2	2	2.8	2.8
17.	CP4094	Mobile and Pervasive Computing	1.8	2.5	1.6	1.8	1.6	2
18.	MP4094	Web Services and API Design	1	3	2.4	3	1	2
19.	CP4092	Data Visualization Techniques	2.2	1	2.4	2.4	1.4	1.6
20.	IF4091	Compiler Optimization Techniques	2.6	2.6	2.8	3	2.5	2.6
21.	CP4002	Formal Models of Software Systems	2	1.4	2.33	2.67	1.8	3
22.	AP4094	Robotics	1.2	2.3	3	2.7	2.2	2
23.	ML4291	Natural Language Processing	1.75	2	2.4	2.6	1	3
24.	IF4093	GPU Computing	3	2	2.5	2.5	2.5	3
25.	IF4073	Devops and Microservices	3	2	1.5	2	2.6	3
26.	MP4292	Mobile Application Development	3	1.6	1.75	2.8	3	2.25
27.	IF4071	Deep Learning	2	2	1.6	3	2.6	2.6
28.	CP4072	Blockchain Technologies	2	1	2.5	2.25	2	2
29.	SE4073	Embedded Software Development	1.3	2	2	2	2.25	2
30.	IF4291	Full Stack Web Application Development	2.33	3	1.75	3	3	3
31.	CP4071	Bioinformatics	1	1.6	1.5	1.67	2	2.6
32.	MP4291	Cyber Physical Systems	2.3	2.5	2.6	1.7	1.7	1.7
33.	MU4291	Mixed Reality	3	1	3	1	1	2

3

ANNA UNIVERSITY, CHENNAI
NON - AUTONOMOUS COLLEGES AFFILIATED ANNA UNIVERSITY
M.E. COMPUTER SCIENCE AND ENGINEERING
REGULATIONS – 2021
CHOICE BASED CREDIT SYSTEM
I TO IV SEMESTERS CURRICULA AND SYLLABI

SEMESTER I

S. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	MA4151	Applied Probability and Statistics for Computer Science Engineers	FC	3	1	0	4	4
2.	RM4151	Research Methodology and IPR	RMC	2	0	0	2	2
3.	CP4151	Advanced Data Structures and Algorithms	PCC	3	0	0	3	3
4.	CP4152	Database Practices	PCC	3	0	2	5	4
5.	CP4153	Network Technologies	PCC	3	0	0	3	3
6.	CP4154	Principles of Programming Languages	PCC	3	0	0	3	3
7.		Audit Course – I*	AC	2	0	0	2	0
PRACTICALS								
8.	CP4161	Advanced Data Structures and Algorithms Laboratory	PCC	0	0	4	4	2
			TOTAL	19	1	6	26	21

*Audit course is optional

SEMESTER II

S. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	CP4291	Internet of Things	PCC	3	0	2	5	4
2.	CP4292	Multicore Architecture and Programming	PCC	3	0	2	5	4
3.	CP4252	Machine Learning	PCC	3	0	2	5	4
4.	SE4151	Advanced Software Engineering	PCC	3	0	0	3	3
5.		Professional Elective I	PEC	3	0	0	3	3
6.		Professional Elective II	PEC	3	0	0	3	3
7.		Audit Course – II*	AC	2	0	0	2	0
PRACTICALS								
8.	CP4211	Term Paper Writing and seminar	EEC	0	0	2	2	1
9.	CP4212	Software Engineering Laboratory	PCC	0	0	2	2	1
			TOTAL	20	0	10	30	23

*Audit course is optional

SEMESTER III

S. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
THEORY								
1.	CP4391	Security Practices	PCC	3	0	0	3	3
2.		Professional Elective III	PEC	3	0	0	3	3
3.		Professional Elective IV	PEC	3	0	2	5	4
4.		Open Elective	OEC	3	0	0	3	3
PRACTICALS								
5.	CP4311	Project Work I	EEC	0	0	12	12	6
			TOTAL	**12**	**0**	**14**	**26**	**19**

SEMESTER IV

S. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
PRACTICALS								
1.	CP4411	Project Work II	EEC	0	0	24	24	12
			TOTAL	**0**	**0**	**24**	**24**	**12**

TOTAL NO. OF CREDITS: 75

PROFESSIONAL ELECTIVES
SEMESTER II, ELECTIVE I

S. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	MP4092	Human Computer Interaction	PEC	3	0	0	3	3
2.	MP4251	Cloud Computing Technologies	PEC	3	0	0	3	3
3.	BD4151	Foundations of Data Science	PEC	3	0	0	3	3
4.	MP4152	Wireless Communications	PEC	3	0	0	3	3
5.	SE4071	Agile Methodologies	PEC	3	0	0	3	3
6.	CP4095	Performance Analysis of Computer Systems	PEC	3	0	0	3	3
7.	CP4001	Advanced Operating System	PEC	3	0	0	3	3
8.	MU4251	Digital Image Processing	PEC	3	0	0	3	3

SEMESTER II, ELECTIVE II

S. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	BD4071	High Performance Computing for Big Data	PEC	3	0	0	3	3
2.	CP4093	Information Retrieval Techniques	PEC	3	0	0	3	3
3.	CP4096	Software Quality Assurance	PEC	3	0	0	3	3
4.	CP4091	Autonomous Systems	PEC	3	0	0	3	3
5.	CP4097	Web Analytics	PEC	3	0	0	3	3
6.	MP4091	Cognitive Computing	PEC	3	0	0	3	3
7.	AP4093	Quantum Computing	PEC	3	0	0	3	3
8.	BD4251	Big Data Mining and Analytics	PEC	3	0	0	3	3

SEMESTER III, ELECTIVE III

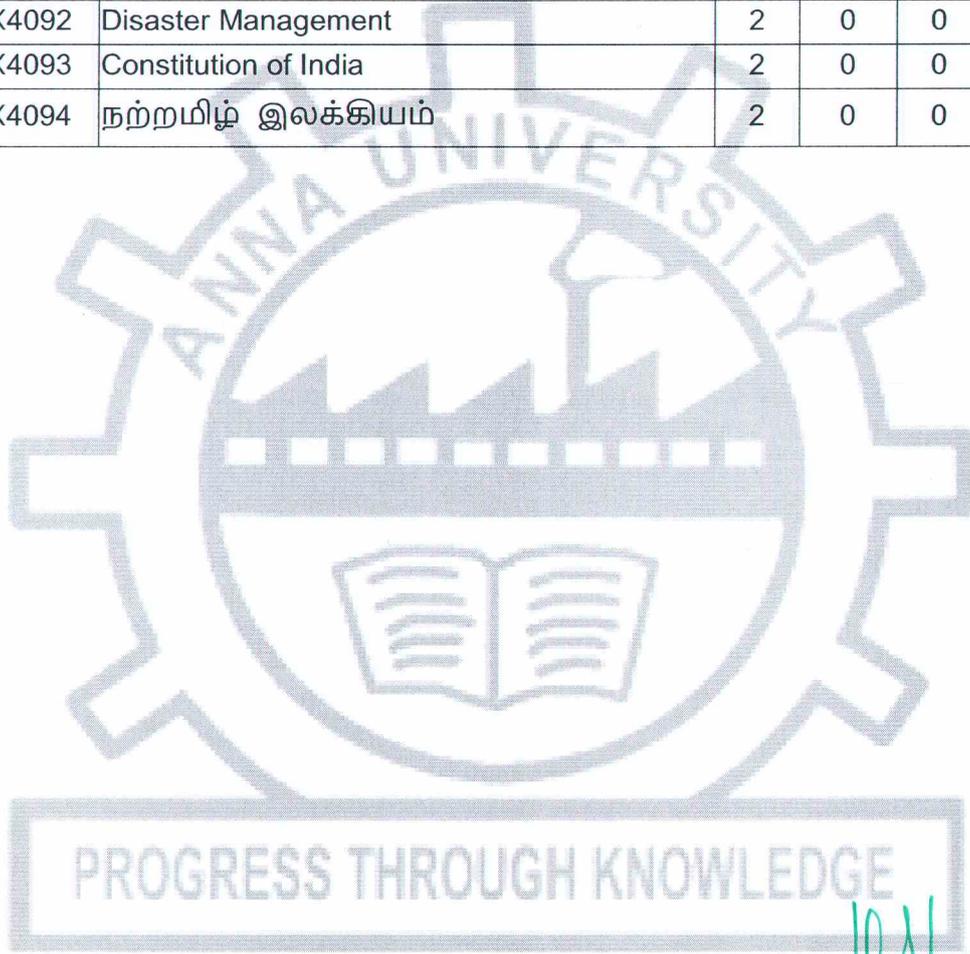| S. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	CP4094	Mobile and Pervasive Computing	PEC	3	0	0	3	3
2.	MP4094	Web Services and API Design	PEC	3	0	0	3	3
3.	CP4092	Data Visualization Techniques	PEC	3	0	0	3	3
4.	IF4091	Compiler Optimization Techniques	PEC	3	0	0	3	3
5.	CP4002	Formal Models of Software Systems	PEC	3	0	0	3	3
6.	AP4094	Robotics	PEC	3	0	0	3	3
7.	ML4291	Natural Language Processing	PEC	2	0	2	4	3
8.	IF4093	GPU Computing	PEC	3	0	0	3	3

SEMESTER III, ELECTIVE IV

S. NO.	COURSE CODE	COURSE TITLE	CATE-GORY	PERIODS PER WEEK			TOTAL CONTACT PERIODS	CREDITS
				L	T	P		
1.	IF4073	Devops and Microservices	PEC	3	0	2	5	4
2.	MP4292	Mobile Application Development	PEC	3	0	2	5	4
3.	IF4071	Deep Learning	PEC	3	0	2	5	4
4.	CP4072	Blockchain Technologies	PEC	3	0	2	5	4
5.	SE4073	Embedded Software Development	PEC	3	0	2	5	4
6.	IF4291	Full Stack Web Application Development	PEC	3	0	2	5	4

7.	CP4071	Bioinformatics	PEC	3	0	2	5	4
8.	MP4291	Cyber Physical Systems	PEC	3	0	2	5	4
9.	MU4291	Mixed Reality	PEC	3	0	2	5	4

AUDIT COURSES (AC)

Registration for any of these courses is optional to students

SL. NO.	COURSE CODE	COURSE TITLE	PERIODS PER WEEK			CREDITS
			L	T	P	
1.	AX4091	English for Research Paper Writing	2	0	0	0
2.	AX4092	Disaster Management	2	0	0	0
3.	AX4093	Constitution of India	2	0	0	0
4.	AX4094	நற்றமிழ் இலக்கியம்	2	0	0	0

LIST OF OPEN ELECTIVES FOR PG PROGRAMMES

SL. NO.	COURSE CODE	COURSE TITLE	PERIODS PER WEEK			CREDITS
			L	T	P	
1.	OCE431	Integrated Water Resources Management	3	0	0	3
2.	OCE432	Water, Sanitation and Health	3	0	0	3
3.	OCE433	Principles of Sustainable Development	3	0	0	3
4.	OCE434	Environmental Impact Assessment	3	0	0	3
5.	OME431	Vibration and Noise Control Strategies	3	0	0	3
6.	OME432	Energy Conservation and Management in Domestic Sectors	3	0	0	3
7.	OME433	Additive Manufacturing	3	0	0	3
8.	OME434	Electric Vehicle Technology	3	0	0	3
9.	OME435	New Product Development	3	0	0	3
10.	OBA431	Sustainable Management	3	0	0	3
11.	OBA432	Micro and Small Business Management	3	0	0	3
12.	OBA433	Intellectual Property Rights	3	0	0	3
13.	OBA434	Ethical Management	3	0	0	3
14.	ET4251	IoT for Smart Systems	3	0	0	3
15.	ET4072	Machine Learning and Deep Learning	3	0	0	3
16.	PX4012	Renewable Energy Technology	3	0	0	3
17.	PS4093	Smart Grid	3	0	0	3
18.	DS4015	Big Data Analytics	3	0	0	3
19.	NC4201	Internet of Things and Cloud	3	0	0	3
20.	MX4073	Medical Robotics	3	0	0	3
21.	VE4202	Embedded Automation	3	0	0	3
22.	CX4016	Environmental Sustainability	3	0	0	3
23.	TX4092	Textile Reinforced Composites	3	0	0	3
24.	NT4002	Nanocomposite Materials	3	0	0	3
25.	BY4016	IPR, Biosafety and Entrepreneurship	3	0	0	3

PRINCIPAL
Mohamed Sathak A.J. College of Engineering
No.34, Rajiv Gandhi Salai (OMR)
Sipcot - IT Highway Egattur,
Chenai - 603103.

FOUNDATION COURSES (FC)

S. NO	COURSE CODE	COURSE TITLE	PERIODS PER WEEK			CREDITS	Sem
			Lecture	Tutorial	Practical		
1.	MA4153	Advanced Mathematical Methods	3	1	0	4	1

PROFESSIONAL CORE COURSES (PCC)

S. NO	COURSE CODE	COURSE TITLE	PERIODS PER WEEK			CREDITS	SEM 1
			Lecture	Tutorial	Practical		
1.	CP4151	Advanced Data Structures and Algorithms	3	0	0	3	I
2.	CP4152	Database Practices	3	0	2	4	I
3.	CP4153	Network Technologies	3	0	0	3	I
4.	CP4154	Principles of Programming	3	0	0	3	I
5.	CP4161	Advanced Data Structures and Algorithms Laboratory	0	0	4	2	I
6.	CP4291	Internet of Things	3	0	2	4	II
7.	CP4292	Multicore Architecture and Programming	3	0	2	4	II
8.	CP4252	Machine Learning	3	0	2	4	II
9.	SE4151	Advanced Software Engineering	3	0	0	3	II
10.	CP4212	Software Engineering Laboratory	0	0	2	1	II
11.	CP4391	Security Practices	3	0	0	3	III

RESEARCH METHODOLOGY AND IPR COURSES (RMC)

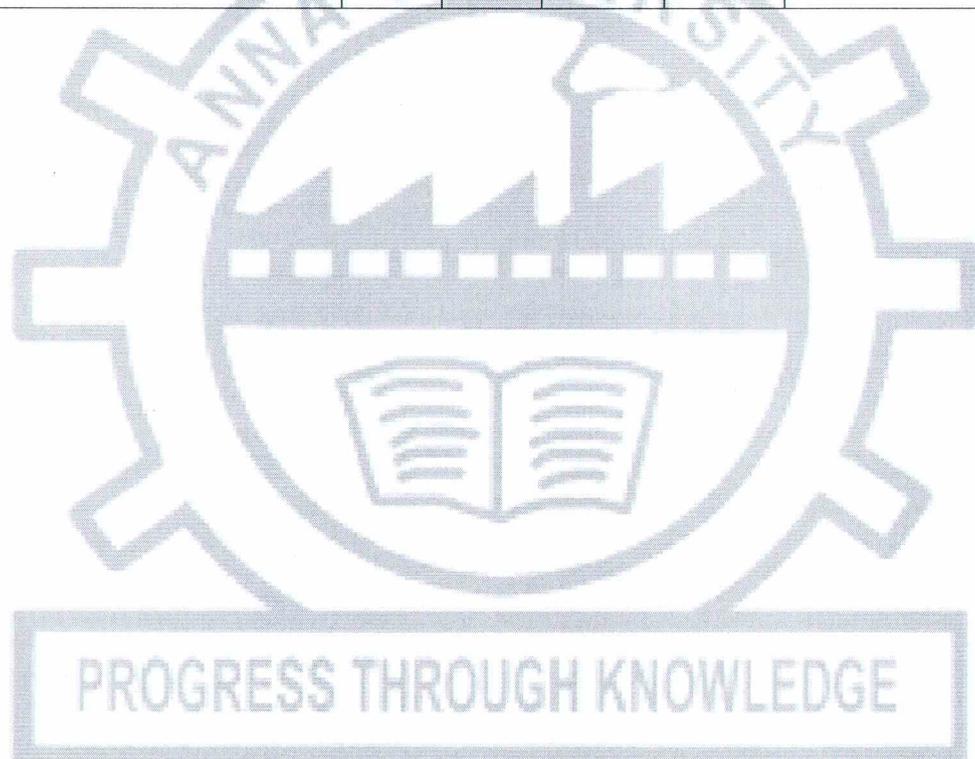| S. NO	COURSE CODE	COURSE TITLE	PERIODS PER WEEK			CREDITS	SEMESTER
			Lecture	Tutorial	Practical		
1.	RM4151	Research Methodology and IPR	2	0	0	2	I

EMPLOYABILITY ENHANCEMENT COURSES (EEC)

S. NO	COURSE CODE	COURSE TITLE	PERIODS PER WEEK			CREDITS	SEMESTER
			Lecture	Tutorial	Practical		
1.	CP4211	Technical Seminar	0	0	2	1	1
2.	CP4311	Project Work I	0	0	12	6	3
3.	CP4411	Project Work II	0	0	24	12	4

SUMMARY

SI. No.	NAME OF THE PROGRAMME: M.E COMPUTER SCIENCE AND ENGINEERING					
	SUBJECT AREA	CREDITS PER SEMESTER				CREDITS TOTAL
		I	II	III	IV	
1.	FC	04	00	00	00	04
2.	PCC	15	16	03	00	34
3.	PEC	00	06	07	00	13
4.	RMC	02	00	00	00	02
5.	OEC	00	00	03	00	03
6.	EEC	00	01	06	12	19
7.	Non Credit/Audit Course	✓	✓	00	00	
8.	**TOTAL CREDIT**	**21**	**23**	**19**	**12**	**75**