Regulations 2024

CHOICE BASED CREDIT SYSTEM

B.Tech. Artificial Intelligence and Data Science

Curriculum and Syllabi for Semesters I TO VIII

I. Program Educational Objectives (PEOs)

Graduates can:

1. Utilize their proficiencies in the fundamental knowledge of basic sciences, mathematics, Artificial Intelligence, data science and statistics to build systems that require management and analysis of large volumes of data.
2. Advance their technical skills to pursue pioneering research in the field of AI and Data Science and create disruptive and sustainable solutions for the welfare of ecosystems.
3. Think logically, pursue lifelong learning and collaborate with an ethical attitude in a multidisciplinary team.
4. Design and model AI based solutions to critical problem domains in the real world.
5. Exhibit innovative thoughts and creative ideas for effective contribution towards economy building.

II. Program Outcomes (POs)

PO# Graduate Attribute

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
5. **Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. **The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. **Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write

effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

III. Program Specific Outcomes (PSOs)

Graduates should be able to:

1. Evolve AI based efficient domain specific processes for effective decision making in several domains such as business and governance domains.
2. Arrive at actionable Foresight, Insight, hind sight from data for solving business and engineering problems.
3. Create, select and apply the theoretical knowledge of AI and Data Analytics along with practical industrial tools and techniques to manage and solve wicked societal problems.
4. Develop data analytics and data visualization skills, skills pertaining to knowledge acquisition, knowledge representation and knowledge engineering, and hence be capable of coordinating complex projects.
5. Able to carry out fundamental research to cater the critical needs of the society through cutting edge technologies of AI.

Mapping of Course Outcome and Programme Outcome

Mapping of Course Outcome and Programme Outcome

Year	Sem	Course Name	PO												PSO		
			1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
I	I	Induction Programme	3	2											3		
		Professional English - I	3	3	3	2								2		3	2
		Matrices and Calculus			3			1		1	1			3		3	
		Engineering Physics	3	3	1.6	1.2	1.8	1						1			
		Engineering Chemistry	2.8	1.3	1.6	1		1.5	1.8					1.5			
		Problem Solving and Python Programming			3		1	2	3						3		3
		தமிழர்மரபு /Heritage of Tamils															
		Problem Solving and Python Programming Laboratory	2	3	3	3	2	-	-	-	-	-	2	2	3	3	-
		Physics and Chemistry	3	2	3	1	1										
		English Laboratory [s]	3	3	3	3	1	3	3	3	3	3	3	3	-	-	-
	II	Professional English - II	3	3	3	3	3	3	3	3	2	3	3	3	-	-	
		Statistics and Numerical Methods	3	3	1	1	1	0	0	0	2	0	2	3	-	-	-
		Physics for Information Science	3	1	3	1	2	1	1	-	-	-	-	2	-	-	-
		Basic Electrical and Electronics Engineering	2	2	1	-	-	-	-	1	-	-	-	2	-	-	1

		Engineering Graphics	3	1	2	-	2	-	-	-	-	3	-	2	2	2	-
		Data Structures Design	2	2.4	2.5	2.6	2.4								2.8	2	2
		தமிழரும் தொழில்நுட்பமும் /Tamils and Technology															
		Engineering Practices Laboratory	3	2	-	-	1	1	1	-	-	-	-	2	2	1	1
		Data Structures Design Laboratory	2.0	2.4	2.5	2.6	2.4								2.8	2	2
		Communication Laboratory / Foreign Language [$]	2	3	3	3	2	3	3	3	3	3	3	3	-	-	-
II	III	Discrete Mathematics	1	3	2	1	-	-	-	-	-	1	-	-	-	-	
		Digital Logic and Computer Organization	3	3	3	3	2	2	1	1	1	1	2	3	1	3	2
		Database Design and Management	2	2	2	2	1	-	-	-	2	2	1	1	2	2	2
		Design and Analysis of Algorithms	3	2	2	2	2	-	-	-	2	2	2	2	2	2	2
		Fundamentals of Data Science	2	1	2	2	1	-	-	-	2	2	2	2	2	2	2
		Object Oriented Programming Using Java	2	1	2	2	1	-	-	-	2	2	2	2	2	2	
		Skill Enhancement III	1	1	2	2	2	2	2	2	2	2	2	2	-	-	-
	IV	Probability and Statistics	3	3	1	1	0	0	0	0	2	0	0	2	-	-	-
		Operating Systems	2	2	2	2	1	-	-	-	2	2	2	2	2	1	2
		Machine Learning	2	2	3	2	2	-	-	-	2	2	2	2	2	2	1
		Artificial Intelligence	2	1	2	2	1				2	2	2	2	2	2	2
		Data Analytics	1	1	2	2	2	-	-	-	3	2	2	2	3	2	1
		Computer Networks	2	2	2	2	2	-	-	-	2	2	2	1	2	2	2
		Engineering Entrepreneurship Development	3	2	1	1	-	2	2	-	-	-	-	2	-	-	-
		Skill Enhancement IV	1	1	2	2	2	-	-	-	3	2	2	2	3	2	1
III	V	Generative AI and Prompt Engineering	2.2	2.6	1.4	1.4	2.4	0.4	0.2	0.6	0.2	0.2	0	2.2	1.2	1	2.2
		Deep Learning	3	2	2	2	2	-	-	-	2	2	1	2	2	2	3
		Cloud Foundations Using AWS	2	2	2	2	2	-	-	-	3	2	2	2	2	2	2
		Devops	3	3	3	3	3	-	-	-	2	2	3	2	2	3	3
		Summer Internship															
		Skill Enhancement V	2	2	2	2	2	-	-	-	2	2	2	2	2	2	2
	VI	Embedded Systems and IoT	3	2	3	2	2	-	-	-	1	2	2	2	2	2	3
		Skill Enhancement VI					3	-	-	-	3	2	3	3	-	-	3
		Mini Project	2	2.5	2.6	2.2	2.5	-	-	-	2	3	-	1.3	2.4	2.4	-
IV	VII	Human Values and Ethics	1	1	1.2	0	0	2.8	2	3	1.6	1.8	1	2	1	2	2

		Skill Enhancement VII	2	2	2	2	2	-	-	-	2	2	2	2	2	2	2
	VIII	Project Work / Internship	2	2.5	2.6	2.2	2.5	-	-	-	2	3	-	1.3	2.4	2.4	-

SUMMARY

Name of the Programme: B.Tech. Artificial Intelligence and Data Science									
S.No	**Subject Area**	**Credits Per Semester**							**Total Credits**
		I	**II**	**III**	**IV**	**V**	**VI**	**VII**	**VIII**
1	HSMC	4	3					5		12
2	BSC	11	7	4	4					26
3	ESC	5	8							13
4	PCC		5	20	20	15	4			64
5	PEC					6	12			18
6	OEC						3	6		9
7	EEC	1	2	1	4	3	3	1	10	25
8	IC									
9	Non-Credit I (Mandatory)		1			✓	✓			1
10	Total	21	26	25	28	24	22	12	10	168

Stella Mary's College of Engineering
Experience Excellence

Regulations 2024

CHOICE BASED CREDIT SYSTEM

B.Tech. Artificial Intelligence and Data Science

Curriculum and Syllabi for Semesters I to VIII

SEMESTER I

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1		Induction Programme	-	-	-	-	-	0
THEORY								
2	24HS3152	Professional English-I	HSMC	3	0	0	3	3
3	24MA3151	Matrices and Calculus	BSC	3	1	0	3	3
4	24PH3151	Engineering Physics	BSC	3	0	0	3	3
5	24CY3151	Engineering Chemistry	BSC	3	0	0	3	3
6	24GE3151	Problem Solving and Python Programming	ESC	3	0	0	3	3
7	24GE3152	தமிழர்மரபு /Heritage of Tamils	HSMC	1	0	0	1	1
PRACTICALS								
8	24GE3171	Physics & Chemistry Laboratory	BSC	0	0	4	4	2
9	24BS3171	Problem Solving and Python Programming Laboratory	ESC	0	0	4	4	2
10	24GE3172	English Laboratory	EEC	0	0	2	2	1
EMPLOYABILITY ENHANCEMENT COURSES								
11	24TP3101	Skill Enhancement I	EEC	0	0	2	2	0
			TOTAL	**16**	**1**	**10**	**27**	**21**

SEMESTER II

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1	24HS3252	Professional English – II	HSMC	2	0	0	2	2
2	24MA3251	Statistics & Numerical Methods	BSC	3	1	0	4	4
3	24PH3256	Physics for Information Science	BSC	3	0	0	3	3
4	24BE3251	Basic Electrical and Electronics Engineering	ESC	3	0	0	3	3
5	24AD3251	Data Structures Design	PCC	3	0	0	3	3

6	24GE3251	Engineering Graphics	ESC	2	0	4	6	4
7	24GE3252	தமிழரும் தொழில்நுட்பமும் /Tamils and Technology	HSMC	1	0	0	1	1
8		NCC Credit Course Level 1	ECR	0	0	2	2	1
PRACTICALS								
9	24GE3271	Engineering Practices Laboratory	ESC	0	0	2	2	1
10	24AD3271	Data Structures Laboratory	PCC	0	0	4	4	2
11	24GE3272	Communication Laboratory / Foreign Language	EEC	0	0	4	4	2
EMPLOYABILITY ENHANCEMENT COURSES								
12	24TP3201	Skill Enhancement II	EEC	0	0	2	2	0
			TOTAL	**17**	**1**	**18**	**36**	**25**

#NCC Credit Course level1 is offered for NCC students only. The grades earned by the students will be recorded in the Mark Sheet, however the same shall not be considered for the computation of CGPA.

SEMESTER – III

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1	24MA3354	Discrete Mathematics	BSC	3	1	0	4	4
THEORY WITH PRACTICAL COMPONENTS								
2	24CS3351	Digital Logic and Computer Organization	PCC	3	0	2	5	4
3	24AD3391	Database Design and Management	PCC	3	0	2	5	4
4	24AD3351	Design and Analysis of Algorithms	PCC	3	0	2	5	4
5	24AD3301	Fundamentals of Data Science	PCC	3	0	2	5	4
6	24AD3302	Object Oriented Programming using JAVA	PCC	3	0	2	5	4
EMPLOYABILITY ENHANCEMENT COURSES								
7	24TP3301	Skill Enhancement III	EEC	0	0	2	2	1
			TOTAL	**18**	**1**	**12**	**31**	**25**

SEMESTER – IV

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1	24MA3391	Probability and Statistics	BSC	3	1	0	4	4

THEORY WITH PRACTICAL COMPONENTS								
2	24AL3452	Operating Systems	PCC	2	0	2	4	4
3	24AL3451	Machine Learning	PCC	3	0	2	5	4
4	24AD3401	Data Analytics	PCC	3	0	2	5	4
5	24CS3591	Computer Networks	PCC	2	0	2	4	4
6	24AD3491	Artificial Intelligence	PCC	3	0	2	5	4
7	24IC3401	Engineering Entrepreneurship Development	EEC	2	0	2	4	3
EMPLOYABILITY ENHANCEMENT COURSES								
8	24TP3401	Skill Enhancement IV	EEC	2	0	0	2	1
			TOTAL	**20**	**1**	**12**	**33**	**28**

SEMESTER – V

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1	24AL3551	Generative AI and Prompt Engineering	PCC	3	0	0	3	3
THEORY WITH PRACTICAL COMPONENTS								
2	24AD3501	Deep Learning	PCC	3	0	2	4	4
3	24CS5501	Cloud Foundations Using AWS	PCC	3	0	2	5	4
4	24AD5502	Devops	PCC	3	0	2	5	4
5		Professional Elective I	PEC	3	0	0	3	3
6		Professional Elective II	PEC	3	0	0	3	3
MANDATORY COURSE								
7		Mandatory Course - I	MC	3	0	0	3	0
EMPLOYABILITY ENHANCEMENT COURSES								
8	24AD512	Summer Internship	EEC	0	0	0	0	2
9	24TP3501	Skill Enhancement V	EEC	2	0	0	2	1
			TOTAL	**23**	**0**	**6**	**28**	**24**

SEMESTER – VI

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY WITH PRACTICAL COMPONENTS								
1	24CS3691	Embedded Systems and IoT	PCC	3	0	2	5	4
2		Open Elective – I *	OEC	3	0	0	3	3
3		Professional Elective III	PEC	3	0	0	3	3
4		Professional Elective IV	PEC	3	0	0	3	3
5		Professional Elective V	PEC	3	0	0	3	3
6		Professional Elective VI	PEC	3	0	0	3	3
MANDATORY COURSE								

7		Mandatory Course - II	AC	3	0	0	3	0
EMPLOYABILITY ENHANCEMENT COURSES								
8	24TP3601	Skill Enhancement VI	EEC	2	0	0	2	1
9	24AD3601	Mini Project	EEC	0	0	2	2	2
			TOTAL	**21**	**-**	**4**	**27**	**22**

***Open Elective – I shall be chosen from the list of open electives offered by other Programmes &**
#Mandatory Course-II is a Non-credit Course (Student shall select one course from the list Given under Mandatory Course-II)

SEMESTER VII

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
THEORY								
1	24GE3791	Human Values and Ethics	HSMC	2	0	0	2	2
2		Elective - Management	HSMC	3	0	0	3	3
3		Open Elective-II **	OEC	3	0	0	3	3
4		Open Elective III**	OEC	3	0	0	3	3
EMPLOYABILITY ENHANCEMENT COURSES								
5	24TP3701	Skill Enhancement	EEC	2	0	0	2	1
			TOTAL	**13**	**0**	**2**	**15**	**12**

***If students undergo internship in Semester VII, then the courses offered during semester II will be offered during semester VIII.**
****Open Elective II- III (Shall be chosen from the list of open electives offered by other Programmes).**

SEMESTER VIII

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
PRACTICALS								
1	24AD3811	Project Work / Internship	EEC	0	0	20	20	10
			TOTAL	**0**	**0**	**20**	**20**	**10**

***If students undergo internship in Semester VII, then the courses offered during semester VII will be offered during semester VIII.**

TOTAL CREDITS: 168

ELECTIVE – MANAGEMENT COURSES

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24GE3751	Principles of Management	HSMC	3	0	0	3	3
2	24GE3752	Total Quality Management	HSMC	3	0	0	3	3
3	24GE3753	Engineering Economics and Financial Accounting	HSMC	3	0	0	3	3
4	24GE3754	Human Resource Management	HSMC	3	0	0	3	3
5	24GE3755	Knowledge Management	HSMC	3	0	0	3	3
6	24GE3792	Industrial Management	HSMC	3	0	0	3	3

MANDATORY COURSES I

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24MX3081	Introduction to Women and Gender Studies	MC	3	0	0	3	0
2	24MX3082	Indian knowledge systems	MC	3	0	0	3	0
3	24MX3083	Production and Operations Management for Entrepreneurs	MC	3	0	0	3	0
4	24MX3084	Disaster Risk Reduction and Management	MC	3	0	0	3	0
5	24MX3085	Well -being with traditional practices-yoga, ayurveda And siddha	MC	3	0	0	3	0

MANDATORY COURSES II

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24MX3086	Environmental Sciences and Sustainability	MC	3	0	0	3	0
2	24MX3087	History of Science and Technology in India	MC	3	0	0	3	0
3	24MX3088	Political and Economic Thought for a Humane Society	MC	3	0	0	3	0
4	24MX3089	State, Nation Building and Politics in India	MC	3	0	0	3	0
5	24MX3090	Industrial Safety	MC	3	0	0	3	0

PROFESSIONAL ELECTIVE COURSES: VERTICALS

Vertical I Generative AI	Vertical II Full Stack Development For IT	Vertical III Cloud Computing And Data Center Technologies	Vertical IV Data Privacy Cyber Security And Data Privacy	Vertical V Creative Media	Vertical VI Emerging Technologies
Knowledge Engineering	Web Technologies	Cloud Computing	Ethical Hacking	Augmented Reality/Virtual Reality	Health Care Analytics
Recommender Systems	App Development	Virtualization	Digital and Mobile Forensics	Multimedia and Animation	Robotic Process Automation
Vision Language Models	Cloud Services Management	Cloud Service Provisioning	Social Network Security	Video Creation and Editing	Neural Networks and Deep Learning
Text and Speech Analysis	UI and UX Design	Data Warehousing	Modern Cryptography	Digital Product Design	Cyber Security
Ethics in AI	Software Testing and Automation	Storage Technologies	Engineering Secure Software Systems	Digital marketing	Quantum Computing
Image and Video Analytics	Web Application Security	Software Defined Networks	Cryptocurrency and Blockchain Technologies	Multimedia Data Compression and Storage	Cryptocurrency and Blockchain Technologies
Computer Vision	Reinforcement Learning	Stream Processing	Network Security	Game Development	Game Development
Medical Imaging	Principles of Programming Languages	Security and Privacy in Cloud	Secure Cloud Computing	Visual Effects	3D Printing and Design

Registration of Professional Elective Courses from Verticals:

Professional Elective Courses will be registered in Semesters V and VI. These courses are listed in groups called verticals that represent a particular area of specialisation / diversified group. Students are permitted to choose all the Professional Electives from a particular vertical or from different verticals. Further, only one Professional Elective course shall be chosen in a semester horizontally (row-wise). However, two courses are permitted from the same row, provided one course is enrolled in Semester V and another in semester VI.

The registration of courses for B.E./B.Tech (Honours) or Minor degree shall be done from Semester V to VIII. The procedure for registration of courses explained above shall be followed for the courses of B.E/B.Tech (Honours) or Minor degree also. For more details on B.E./B.Tech (Honours) or Minor degree refer to the Regulations 2021, Clause 4.10 (Amendments).

PROFESSIONAL ELECTIVE COURSES:VERTICALS

VERTICAL 1: VERTICALS FOR GENERATIVE AI

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24CCS350	Knowledge Engineering	PEC	2	0	2	4	3
2	24CCS360	Recommender Systems	PEC	2	0	2	4	3
3	24CCS364	Vision Language Models	PEC	2	0	2	4	3
4	24CCS369	Text and Speech Analysis	PEC	2	0	2	4	3
5	24CCS345	Ethics in AI	PEC	2	0	2	4	3
6	24CCS349	Image and Video Analytics	PEC	2	0	2	4	3
7	24CCS338	Computer Vision	PEC	2	0	2	4	3
8	24CCS349	Medical Imaging	PEC	2	0	2	4	3

VERTICAL 2: FULL STACK DEVELOPMENT FOR IT

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24CCS375	Web Technologies	PEC	2	0	2	4	3
2	24CCS332	App Development	PEC	2	0	2	4	3
3	24CCS336	Cloud Services Management	PEC	2	0	2	4	3
4	24CCS370	UI and UX Design	PEC	2	0	2	4	3
5	24CCS366	Software Testing and Automation	PEC	2	0	2	4	3
6	24CCS374	Web Application Security	PEC	2	0	2	4	3
7	24CCS398	Reinforcement Learning	PEC	2	0	2	4	3
8	24CCS358	Principles of Programming Languages	PEC	2	0	2	4	3

VERTICAL 3: CLOUD COMPUTING AND DATA CENTER TECHNOLOGIES

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24CCS335	Cloud Computing	PEC	2	0	2	4	3
2	24CCS372	Virtualization	PEC	2	0	2	4	3
3	24CSS336	Cloud Service Provisioning	PEC	2	0	2	4	3
4	24CCS341	Data Warehousing	PEC	2	0	2	4	3

5	24CCS367	Storage Technologies	PEC	2	0	2	4	3
6	24CCS365	Software Defined Networks	PEC	2	0	2	4	3
7	24CCS368	Stream Processing	PEC	2	0	2	4	3
8	24CCS362	Security and Privacy in Cloud	PEC	2	0	2	4	3

VERTICAL 4: DATA PRIVACY CYBER SECURITY AND DATA PRIVACY

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24CCS344	Ethical Hacking	PEC	2	0	2	4	3
2	24CCS343	Digital and Mobile Forensics	PEC	2	0	2	4	3
3	24CCS363	Social Network Security	PEC	2	0	2	4	3
4	24CCS351	Modern Cryptography	PEC	2	0	2	4	3
5	24CB3591	Engineering Secure Software Systems	PEC	2	0	2	4	3
6	24CCS339	Cryptocurrency and Blockchain Technologies	PEC	2	0	2	4	3
7	24CCS354	Network Security	PEC	2	0	2	4	3
8	24CSS362	Secure Cloud Computing	PEC	2	0	2	4	3

VERTICAL 5: CREATIVE MEDIA

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24CCS333	Augmented Reality/Virtual Reality	PEC	2	0	2	4	3
2	24CCS352	Multimedia and Animation	PEC	2	0	2	4	3
3	24CCS371	Video Creation and Editing	PEC	2	0	2	4	3
4	24CSS370	Digital Product Design	PEC	2	0	2	4	3
5	24CCW332	Digital marketing	PEC	2	0	2	4	3
6	24CCS353	Multimedia Data Compression and Storage	PEC	2	0	2	4	3
7	24CCS347	Game Development	PEC	2	0	2	4	3
8	24CCS373	Visual Effects	PEC	2	0	2	4	3

VERTICAL 6: EMERGING TECHNLOGIES

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24AD3002	Health Care Analytics	PEC	2	0	2	4	3
2	24CCS361	Robotic Process Automation	PEC	2	0	2	4	3
3	24CCS355	Neural Networks and Deep Learning	PEC	2	0	2	4	3
4	24CCS340	Cyber Security	PEC	2	0	2	4	3
5	24CCS359	Quantum Computing	PEC	2	0	2	4	3
6	24CCS339	Cryptocurrency and Blockchain Technologies	PEC	2	0	2	4	3
7	24CCS347	Game Development	PEC	2	0	2	4	3
8	24CCS331	3D Printing and Design	PEC	2	0	2	4	3

***Students shall choose the open elective courses, such that the course contents are not similar to any other course contents / title under other course categories.**

**** Students are not permitted to opt for Open Elective(OE) courses offered by their parent department**

OPEN ELECTIVES

OPEN ELECTIVE-I

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24OEEE01	Semiconductor Memories	OEC	3	0	0	3	3
2	24OEEE02	Electrical Safety And Safety Management	OEC	3	0	0	3	3
3	24OEEC01	IoT Concepts And Applications	OEC	2	0	2	3	3
4	24OEEC02	Drone Technologies	OEC	3	0	0	3	3
5	24OECE01	Plastic And E-Waste Management	OEC	3	0	0	3	3
6	24OECE02	Remote Sensing And GIS Applications In	OEC	3	0	0	3	3

		Environmental Management						
7	24OECS01	Advanced Java Technologies	OEC	3	0	0	3	3
8	24OECS02	Machine Learning Paradigms	OEC	3	0	0	3	3
9	24OEME01	Fundamentals Of Aeronautical Engineering	OEC	3	0	0	3	3
10	24OEME02	Energy Technology	OEC	3	0	0	3	3
11	24OEAD101	Artificial Intelligence and Machine Learning Fundamentals	OEC	3	0	0	3	3
12	24OEAD102	Business Intelligence and Its Applications	OEC	3	0	0	3	3

OPEN ELECTIVE-II

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24OEEE03	Energy Storage System	OEC	3	0	0	3	3
2	24OEEE04	Energy Management And Auditing	OEC	3	0	0	3	3
3	24OEEC03	Robotic Process Automation	OEC	2	0	2	3	3
4	24OEEC04	Fundamentals Of Embedded And IoT	OEC	2	0	2	3	3
5	24OECE03	Green Building Design	OEC	3	0	0	3	3
6	24OECE04	Safety in Construction	OEC	3	0	0	3	3
7	24OECS03	IoT And Edge Computing	OEC	2	0	2	3	3
8	24OECS04	IT In Agricultural System	OEC	3	0	0	3	3
9	24OEME03	Environmental Engineering And Pollution Control	OEC	3	0	0	3	3
10	24OEME04	Elements Of Marine Engineering	OEC	3	0	0	3	3
11	24OEAD03	Augmented Reality / Virtual Reality	OEC	3	0	0	3	3

12	24OEAD04	Digital Forensics	OEC	3	0	0	3	3

OPEN ELECTIVE-III

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24OEEE05	Electric Vehicles	OEC	3	0	0	3	3
2	24OEEE06	Green Energy Sources	OEC	3	0	0	3	3
3	24OEEC05	Consumer Electronics	OEC	3	0	0	3	3
4	24OEEC06	Sensors And Actuators	OEC	3	0	0	3	3
5	24OECE05	Urban Agriculture	OEC	3	0	0	3	3
6	24OECE06	Irrigation Engineering	OEC	3	0	0	3	3
7	24OECS05	Deep Learning Techniques	OEC	3	0	0	3	3
8	24OECS06	Ethical Hacking And Network Defense	OEC	3	0	0	3	3
9	24OEME05	Alternative Fuels And Energy Systems	OEC	3	0	0	3	3
10	24OEME06	Foundation of Robotics	OEC	3	0	0	3	3
11	24OEAD05	Block chain Architecture And Design	OEC	3	0	0	3	3
12	24OEAD06	Full Stack Development	OEC	3	0	0	3	3

VERTICALS FOR MINOR DEGREE

(In addition to all the verticals of other programmes)

Vertical I Fintech and Block Chain	Vertical II Entrepreneurship	Vertical III Public Administration	Vertical IV Business Data Analytics	Vertical V Environment and Sustainability
Financial Management	Foundations of Entrepreneurship	Principles of Public Administration	Statistics for Management	Sustainable infrastructure Development
Fundamentals of Investment	Team Building & Leadership Management for Business	Constitution of India	Data mining for Business Intelligence	Sustainable Agriculture and Environmental Management
Banking, Financial Services and Insurance	Creativity & Innovation in Entrepreneurship	Public Personnel Administration	Human Resource Analytics	Sustainable Bio Materials
Fintech Personal Finance and Payments	Principles of Marketing Management for Business	Administrative Theories	Marketing and Social Media Web Analytics	Materials for Energy Sustainability
Introduction to Fintech	Human Resource Management for Entrepreneurs	Indian Administrative System	Operation and Supply Chain Analytics	Green Technology
-	Financing New Business Ventures	Public Policy Administration	Financial Analytics	Environmental Quality Monitoring and Analysis
-	-	-	-	Integrated Energy Planning for Sustainable Development
-	-	-	-	Energy Efficiency for Sustainable Development

(choice of courses for Minor degree is to be made from any one vertical of other programmes or from anyone of the following verticals)

VERTICAL 1: FINTECH AND BLOCK CHAIN

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24CMG331	Financial Management	PEC	3	0	0	3	3
2	24CMG332	Fundamentals of Investment	PEC	3	0	0	3	3
3	24CMG333	Banking, Financial Services and Insurance	PEC	3	0	0	3	3
4	24CMG334	Introduction to Blockchain and its Applications	PEC	3	0	0	3	3
5	24CMG335	Fintech Personal Finance and Payments	PEC	3	0	0	3	3
6	24CMG336	Introduction to Fintech	PEC	3	0	0	3	3

VERTICAL 2: ENTREPRENEURSHIP

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24CMG337	Foundations of Entrepreneurship	PEC	3	0	0	3	3
2	24CMG338	Team Building &Leadership Management for Business	PEC	3	0	0	3	3
3	24CMG339	Creativity & Innovation in Entrepreneurship	PEC	3	0	0	3	3
4	24CMG340	Principles of Marketing Management For Business	PEC	3	0	0	3	3
5	CMG341	Human Resource Management for Entrepreneurs	PEC	3	0	0	3	3
6	CMG342	Financing New Business Ventures	PEC	3	0	0	3	3

VERTICAL 3: PUBLIC ADMINISTRATION

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24CMG343	Principles of Public Administration	PEC	3	0	0	3	3
2	24CMG344	Constitution of India	PEC	3	0	0	3	3
3	24CMG345	Public Personnel Administration	PEC	3	0	0	3	3
4	24CMG346	Administrative Theories	PEC	3	0	0	3	3

5	24CMG347	Indian Administrative System	PEC	3	0	0	3	3
6	24CMG348	Public Policy Administration	PEC	3	0	0	3	3

VERTICAL 4: BUSINESS DATA ANALYTICS

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24CMG349	Statistics for Management	PEC	3	0	0	3	3
2	24CMG350	Data mining For Business Intelligence	PEC	3	0	0	3	3
3	24CMG351	Human Resource Analytics	PEC	3	0	0	3	3
4	24CMG352	Marketing And Social Media Web Analytics	PEC	3	0	0	3	3
5	24CMG353	Operation And Supply Chain Analytics	PEC	3	0	0	3	3
6	24CMG354	Financial Analytics	PEC	3	0	0	3	3

VERTICAL 5: ENVIRONMENT AND SUSTAINABILITY

Si.No	Course Code	Course Name	Category	Periods Per Week			Total Contact Periods	Credits
				L	T	P		
1	24CES331	Sustainable infrastructure Development	PEC	3	0	0	3	3
2	24CES332	Sustainable Agriculture and Environmental Management	PEC	3	0	0	3	3
3	24CES333	Sustainable Bio Materials	PEC	3	0	0	3	3
4	24CES334	Materials for Energy Sustainability	PEC	3	0	0	3	3
5	24CES335	Green Technology	PEC	3	0	0	3	3
6	24CES336	Environmental Quality Monitoring and Analysis	PEC	3	0	0	3	3
7	24CES337	Integrated Energy Planning for Sustainable Development	PEC	3	0	0	3	3
8	24CES338	Energy Efficiency For Sustainable Development	PEC	3	0	0	3	3