SRI KRISHNA ARTS AND SCIENCE COLLEGE

An Autonomous College Affiliated to Bharathiar University

Coimbatore - 641008, Tamil Nadu, India.

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (LOCF)

M.Sc. Computer Science

(I to IV Semester)

for 2024-25 admitted students

DEPARTMENT OF SOFTWARE SYSTEMS

SRI KRISHNA ARTS AND SCIENCE COLLEGE
COIMBATORE – 641008

DEPARTMENT OF SOFTWARE SYSTEMS

I. Programme Educational Objectives (PEOs)

Post Graduates from the Computer Science Programme are expected to achieve the following PEOs within two years of graduation

PEO 1	Develop programme with area of specialization with software skills through modern IT methods in the field with wider research knowledge.
PEO 2	Become a team leader and work with a group in solving complex problems through up-to-date domain knowledge of the relevant areas including the software and hardware skills through effective communicative skills.
PEO 3	Keep up-to-date information in advanced knowledge for lifelong learning and provide professional services with competence in the relevant field.
PEO 4	Demonstrate ethical and professional values in providing services in the relevant field including entrepreneurial skills.

II. Programme Learning Outcomes (PLOs)

The following Programme Learning Outcomes have been identified for M.Sc.Computer Science:

PLO 1	**Knowledge:** Apply the comprehensive knowledge to real life problems to meet the core competency with continuous up graduation **(Cognitive)**
PLO 2	**Critical Thinking Skills:** Learn the technological advancements and understand the usage of modern design and development tools. **(Cognitive)**
PLO 3	**Practical Skills:** Ability to become proficient in the concepts and applications in the key areas of computer science like Web designing and development, Mobile applications, Network and communication technologies by exploring the scope in the field of research **(Psychomotor)**
PLO 4	**Team-work Skills:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings with management principles, required to work in a team with stewardship of the society **(Affective)**
PLO 5	**Communication Skills:** Communicate in both oral and written forms, demonstrating the practice of professional ethics and the concerns for social welfare **(Affective)**

PLO 6	**Digital Skills:** Ability to model, analyze, design, visualize and realize physical systems or processes of increasing size and complexity **(Affective)**
PLO 7	**Numeracy Skills:** Demonstrate the extended investigation of mathematical models to resolve real time problems **(Cognitive)**
PLO 8	**Leadership Skills:** Develop technical and managerial skills needed to be an effective leader as an entrepreneur or in a software concern **(Affective)**
PLO 9	**Lifelong Learning Skills:** Recognize the need and ability to involve independent and life-long learning in the changing era of technology **(Affective)**
PLO 10	**Entrepreneurial Skills:** Apply designing skills to address various social problems identified in private and public sectors and to take up entrepreneurship in business applications **(Affective)**
PLO 11	**Ethics &Professional Skills:** Demonstrate professionally with social, cultural and ethical responsibility as an individual as well as in multifaceted teams with positive attitude **(Affective)**

III. Programme Learning Outcomes Vs Graduate Attributes Vs Taxonomy of Verbs

	Graduate Attributes											Blooms		
PLO	Critical Thinking	Practical	Team work	Communication skills	Digital skills	Numeracy	Leadership skills	Lifelong learning	Entrepreneurial skills	Ethics & Professionalism	Cognitive	Psychomotor	Affective
1	√											√		
2		√										√		
3			√										√	
4				√										√
5					√									√
6						√								√
7							√					√		
8								√						√
9									√					√
10										√				√
11											√			√

IV. Mapping of PEOs and PLOs

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11
PEO1	3		3			3					
PEO2		3					3				
PEO3				3				3		2	3
PEO4					3				2		

V. Additional Programme Outcomes (APOs)

The Additional Programme Outcomes for M.Sc. Computer Science are:

APO 1	The students will have an ability to build networks and broaden horizons and engaging authentically through social intelligence Quotient and Emotional Quotient
APO 2	Ability to translate vast data into abstract concepts and to understand data base reasoning
APO 3	Ability to develop working in virtual collaborating platforms to transfer different types of information and work towards a common goal
APO 4	Ability to develop critical thinking and innovative skills as a potential to advance career
APO 5	Having a good digital foot print

Vi. Programme Specific Outcomes (PSOs)

On the completion of M.Sc. Computer Science, the graduates will able to

PSO 1	Design, Build and maintain projects with the ability to practice and improve as computer professionals
PSO 2	Ability to utilize Computing knowledge and skills for the betterment of society.

VII. Curriculum Structure for M.Sc. Computer Science

Course Components, Credits & Marks Distribution

Course Type	Number of Courses	Credits per Course	Total Credits	Marks	Semester
Discipline Specific Courses (DSC)	18	2-8	69	1750	I to IV

Discipline Specific Elective Courses (DSE)	3	4	12	300	II & III
Generic Electives Courses (GEC)	3	2-4	9	200	II & III
DTC – Drive Through Courses (SWAYAM-NPTEL, Coursera, Any courses certified by statutory bodies, etc.)	Additional 4 Credits per Course will be given on submission of Certificate				I to IV
Total			**90**	**2250**	

1. Discipline Specific Courses (DSC)

These courses are to be studied compulsorily by the students as a core requirement. The students are required to take DSCs across four semesters. The courses designed under this category aim to cover the basics that a student is expected to imbibe in the particular discipline.

S. No.	Course Code	Course Title	Semester	Contact Hours	Credits	Marks
1	24CSP01/ 24ITP01	**DSC I**: Advanced Java Programming	I	5	4	100
2	24CSP02	**DSC II:** Machine Learning	I	5	4	100
3	24CSP03/ 24ITP03	**DSC III:** Design and Analysis of Algorithms	I	5	4	100
4	24CSP04/ 24ITP04	**DSC Practical-I**: Advanced Java Lab	I	5	4	100
5	24CSP05/ 24ITP05	**DSC IV:** Data Mining	I	5	4	100
6	24CSP06/ 24ITP06	**DSC V:** Cryptography and Network Security	II	5	4	100
7	24CSP07A/ 24ITP07A	**DSC VI:** Linux Programming	II	3	2	50
8	24CSP07B/ 24ITP07B	**DSC Practical-II**: Programming in Linux	II	2	2	50
9	24CSP08/ 24ITP08	**DSC VII:** Compiler Design	II	5	4	100
10	24CSP09/ 24ITP09/	**DSC Practical-III**: Cryptography and Network Security Lab Using NS3	II	3	3	100
11	24CSP10/ 24ITP10	**DSC VIII**: Python for Data Science	II	4	4	100

12	24CSP11/ 24ITP11	**DSC Practical-IV**: Data Science Lab Using Python	II	3	3	100
13	24CSP12/ 24ITP12	**DSC IX:**:Digital Image Processing	III	5	4	100
14	24CSP13/ 24ITP13	**DSC Practical –V** Image Processing Lab	III	4	4	100
15	24CSP14/ 24ITP14	**DSC X:** Artificial Intelligence	III	5	4	100
16	24CSP15/ 24ITP15	**DSC Practical-VI**: Self Study Paper- Software Testing Lab using Selenium	III	-	2	50
17	24CSP16/ 24ITP16	**DSC XI:** Mini Project	III	-	3	50
18	24CSP17	**DSC Practical VII:** Data Visualization using Tableau (open book)	IV	3	2	50
19	24CSP18/ 24ITP18	**DSC-XII**: Project	IV	-	8	200
		Total			**69**	**1750**

Project Work

During the fourth semester, each student has to undertake a Project Work individually. A guide will be allotted to each student by the department. Student can select any relevant topic in discussion with the guide. The project report shall be subject to internal evaluation followed by a viva-voce. The project should be demonstrated at the time of examination.

CIA marks: 40% of the total marks

3 Reviews – 50 Marks
Work Diary – 30 Marks
Attendance – 20 Marks
Total – **100 Marks** Will be converted into **80 (Internal Marks)**

End Semester Viva-Voce will be conducted for 120 (External) Marks.
(Dissertation - 80 Marks & Viva-voce - 40 Marks)

2. Discipline Specific Electives (DSE) (3 Courses)

Discipline Specific Elective Courses offered under the main discipline of study which may be specialized or advanced or supportive to the discipline of study. Students can choose any THREE courses from the following list. Students can opt one course from each group.

S. No.	Course Code	Course Title	Semester	Contact Hours	Credits	Marks
1	24CSP21/ 24ITP21	**DSE I:** Cloud Services / Data Science and Big Data Analytics	II	5	4	100
2	24CSP22/ 24ITP22	**DSE II:** Dot Net Programming/ Cyber Security	III	5	4	100
3	24CSP23/ 24ITP23	**DSE II Practical:** Dot Net Programming Lab/ Cyber Security Lab	III	4	4	100
Total				**14**	**12**	**300**

3. Generic Elective Courses (GEC) (3 Courses)

Generic Elective Courses are interdisciplinary in nature. They are additional courses based on expertise, specialization, requirements, scope, and need of the department. The students will have the choice of taking THREE GECs.

List of Courses Offered by Mathematics and ECS Department

Group	Course Code	Course Title	Semester	Contact Hours	Credits	Marks
I	24GEP01	Discrete Mathematical Structures	I	5	4	100
II	24GEP19	Robotics Programming	III	4	3	50
III	24GEP20	Robotics Programming Lab	III	3	2	50
Total					**9**	**200**

4. Drive Through Course (DTC)

i. (DTC) I & II – Online Certification - Additional Credits

These courses are intended to bring out and promote the self-learning initiative of the students – where their own motivation is what drives them to complete the course and not external compulsions. This fosters the habit of keeping oneself updated always by means of self-study. It gives opportunities to the students to explore new areas of interest and earn additional credits. Students can take any number of courses under this cafeteria system. The credits will not be taken for CGPA calculation. Additional 4 credits per Course will be given on submission of certificate.

a. SWAYAM-NPTEL
b. Coursera
c. Any courses certified by statuary bodies.

ii. (DTC) III & IV – Article/Book Publication - To be Completed

Students individually or with the maximum of four members per batch are asked to publish article in Scopus or Web of Science Journals (Or) publish book chapters. Additional 4 credits per Course will be given on submission of proof of the published paper (or) book chapter.

emester-wise Scheme

Semester I										
Course Code	Course Title	T/P	Ins. Hrs/ week	Examination				Credits	SD/ EM/ EN	L/R/ N/G
				Dur Hrs	CIA	ES	Total Marks			
24CSP01/ 24ITP01	**DSC I :** Advanced Java Programming	T	5	3	25	75	100	4	SD	G
24CSP02	**DSC II**: Machine Learning	T	5	3	25	75	100	4	SD	G
24CSP03/ 24ITP03	**DSC III**: Design and Analysis of Algorithms	T	5	3	25	75	100	4	SD	G
24CSP04/ 24ITP04	**DSC Practical-I:** Advanced Java Lab	P	5	3	40	60	100	4	SD/ EM/ EN	G
24CSP05/ 24ITP05	**DSC IV**: Data Mining	T	5	3	25	75	100	4	SD/ EM/ EN	G
24GEP01	**GEC-I:** Discrete Mathematical Structures	T	5	3	25	75	100	4	SD	G
DTC I - Additional Credit Courses (NPTEL/ Coursera)										
Total			**30**				**600**	**24**		

Semester II										
Course Code	Course Title	T/P	Ins. Hrs/ week	Examination				Credits	SD/ EM/ EN	L/R/ N/G
				Dur Hrs	CIA	ES	Total Marks			
24CSP06/ 24ITP06	**DSC V**: Cryptography and Network Security	T	5	3	25	75	100	4	EM	G
24CSP07A/ 24ITP07A	**DSC VI:** Linux Programming	T	3	3	10	40	50	2	SD/ EM	G
24CSP07B/ 24ITP07B	**DSC Practical-II**: Programming in Linux	P	2	2	10	40	50	2	EM	G
24CSP08/ 24ITP08	**DSC VII**: Compiler Design	T	5	3	25	75	100	4	SD	G

24CSP09/ 24ITP09	**DSC Practical-III**: Cryptography and Network Security Lab using NS3	P	3	3	40	60	100	3	SD	G
24CSP10/ 24ITP10	**DSC VIII:** Python for Data Science	T	4	3	25	75	100	4	SD/ ED	G
24CSP11/ 24ITP11	**DSC Practical IV** : Data Science Lab Using Python	P	3	3	40	60	100	3	SD/ ED	G
24CSP21/ 24ITP21	**DSE I:** Cloud Services / Data Science and Big Data Analytics	T	5	3	25	75	100	4	EM	G
DTC II - Additional Credit Courses (NPTEL/ Coursera)										
Total			**30**				**700**	**26**		

Semester III

Course Code	Course Title	T/ P	Ins. Hrs/ week	Examination				Credits	SD/ EM/ EN	L/R/ N/G
				Dur. Hrs	CIA	ES	Total Marks			
24CSP12/ 24ITP12	**DSC IX:**: Digital Image Processing	T	5	3	25	75	100	4	EM	G
24CSP13/ 24ITP13	**DSC Practical V** : Image Processing Lab	P	4	3	40	60	100	4	SD	G
24CSP14/ 24ITP14	**DSC X:** Artificial Intelligence	T	5	3	25	75	100	4	EM	G
24CSP15/ 24ITP15	**DSC Practical V**I: Self Study Paper- Software Testing Lab using Selenium	P	-	3	-	50	50	2	SD	G
24CSP16/ 24ITP16	**DSC XI:** Mini Project	P	-	-	-	50	50	3	EN	G
24CSP22/ 24ITP22	**DSE II:** Dot Net Programming/ Cyber Security	T	5	3	25	75	100	4	SD	G
24CSP23/ 24ITP23	**DSE II Practical:** Dot Net Programming Lab/ Cyber Security Lab	P	4	3	40	60	100	4	SD	G
24GEP19	**GEC-II:** Robotics Programming	T	4	3	10	40	50	3	EM	G
24GEP20	**GEC-II: Practical** Robotics ProgrammingLab	P	3	3	20	30	50	2	EM	G

Total		**30**				**700**	**30**		
DTC III – Article Publications / Book Publications									
Semester IV									
Course Code	**Course Title**	**T/P**	**Ins. Hrs/ week**	**Examination**				**Credits**	**SD/ EM/ EN**	**L/R/ N/G**
				Dur Hrs	**CIA**	**ES**	**Total Marks**			
24CSP17	**DSC Practical- VII:** Data Visualization using Tableau (Open Book)	P	3	3	-	50	50	2	SD	G
24CSP18/ 24ITP18	**DSC-XII**: Project	P	-	-	80	120	200	8	EN	G
DTC IV – Article Publications / Book Publications									
Total			**3**				**250**	**10**		
Total							**2250**	**90**		
Drive-Through Course (DTC): Courses offered in SWAYAM-NPTEL, Coursera OR Any courses certified by statutory bodies.			Additional 4 credits per Course will be given on submission of Certificate					During Semester I to Semester IV		

The Courses focus on the following needs	
SD	Skill Development
EM	Employability
EN	Entrepreneurship
L	Local
R	Regional
N	National
G	Global

Semester-wise Distribution of Marks and Credits:

Semester	Total Marks	Total Credits
I	600	24
II	700	26
III	700	30

IV	250	10
Total	**2250**	**90**

OFFERED BY

List of Courses Offered by Software Systems Department

SEM	Course Code	Course Title	Programme	T / P	Ins. Hrs/ week	Examination				Credits
						Dur. Hrs	CIA	ES	Total Marks	
II	24GEP26	PC Software Lab	M.A. English Literature	P	4	3	40	60	100	3
I	24GEP23	RDBMS using Oracle	M.Sc. Mathematics with Big Data	T	4	3	10	40	50	2
	24GEP24	RDBMS using oracle Lab	M.Sc. Mathematics with Big Data	P	2	3	20	30	50	2
II	24GEP25	Data Mining and Data Warehousing	M.Sc. Mathematics with Big Data	T	4	3	25	75	100	4
III	24GEP27/ 24GEP28	Introduction to Database and Data Mining / Data Analytics using R	M.Sc. Bioinformatics	T	4	3	25	75	100	4

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List of Courses Offered by Mathematics Department

Sem	Course code	Course title	Progr amme	T/ P	Ins. Hrs	Examination				Credit
						Dur Hrs	CIA	ES	Total Marks	
I	24GEP01	Discrete Mathematical Structures	M.Sc CS	T	5	3	25	75	100	4

List of Courses Offered by ECS Department

Sem	Course code	Course title	Progr amme	T/ P	Ins. Hrs	Examination				Credit
						Dur Hrs	CIA	ES	Total Marks	
III	24GEP19	Robotics Programming	M.Sc CS	T	4	3	10	40	50	3

III	24GEP20	Robotics Programming Lab	M.Sc CS	P	3	3	20	30	50	2