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. Mathematics with Big Data

For 2023-24 admitted students

DEPARTMENT OF MATHEMATICS

SRI KRISHNA ARTS AND SCIENCE COLLEGE
COIMBATORE – 641008

DEPARTMENT OF MATHEMATICS

(2023-2024)

I. PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)	
PEO 1	Graduates will be able to become Knowledgeable in multi-disciplinary area by applying Mathematical skills through analysis, interpretation and formulation of research knowledge.
PEO 2	Graduates will be able to apply up to date information in problem solving through numerical knowledge for lifelong learning and provide professional services with competence.
PEO 3	Graduates will be able to perform as a team leader and work with a group in solving complex problems through up- to date domain knowledge including the interdisciplinary fields by applying information from various sources effectively.
PEO 4	Graduates will be able to demonstrate ethical and professional values in providing services in the relevant field including entrepreneurial skills.

II. PROGRAMME LEARNING OUTCOMES (PLOs)	
S.No.	**The Graduates of M.Sc Mathematics Programme will be able to:**
PLO1	Describe the theoretical concepts and conventions through wider knowledge related to the current trends.(Cognitive)
PLO2	Develop skills in logical thinking and resolving complex problems through critical thinking skills.(Cognitive)
PLO3	Establish technical and operational skills in solving the multidisciplinary tasks related to current areas of research in the field.(Psychomotor)
PLO4	Form as a team in generating competitive decisions through projects in the field of Mathematics and strive for excellence.(Affective)
PLO5	Apply scientific approach and capability to undertake responsibilities for sustainable growth in professional by ensuring effective communication both in verbal and nonverbal form.(Affective)
PLO6	Using wide range of information, media and technological application and utilizing the recent social and digital skills platform in solving the current issues in the field of Mathematics.(Affective)
PLO7	Apply quantitative, numerical and statistical skills through the visual and graphical aids for related problems in order to develop research biased knowledge. (Cognitive)
PLO8	Progressively adopt effective leadership skills to work efficiently in a competitive domestic and global environment. (Affective)
PLO9	Display the skills and principles of lifelong learning in their academic, career, research development and contribute to the economic growth of a country.(Affective)
PLO10	Enhance entrepreneurial skills and professional development through consultancy and extension services at a competitive level.(Affective)
PLO11	Progressively adopt and appreciate professional ethics also commit professionally, ethically, and independently with the ultimate responsibility in line with code of conduct in related field.(Affective)

III. PROGRAMME LEARNING OUTCOMES VS GRADUATE ATTRIBUTES VSTAXONOMY OF VERBS																
PLO	Knowledge	Critical Thinking	Practical Skills	Digital skills	Team work	Numeracy	Communication Skills	Leadership skills	Lifelong learning	Entrepreneurial skills	Professionalism	Ethics &	Cognitive	Psychomotor	Affective
1	√	√													
2	√	√													
3	√	√													
4	√	√													
5	√	√													
6	√	√													
7	√	√													
8	√	√													
9	√	√													
10	√	√													
11	√	√													

IV. PROGRAMME LEARNING OUTOMES VS PROGRAMME EDUCATIONAL OBJECTIVES				
PLO	PEO 1	PEO 2	PEO 3	PEO 4
PLO 1	√			
PLO 2	√			
PLO 3	√			
PLO 4	√			
PLO 5	√			
PLO 6	√			
PLO 7	√			
PLO 8	√			
PLO 9	√			
PLO 10	√			
PLO 11	√			

V. ADDITIONAL PROGRAMME OUTCOMES (APOs)	
APO 1	Ability to build lasting network and broaden horizons through IQ and EQ.
APO 2	Ability to interpret vast data into set of equations in order to understand data base reasoning, and finding optimal solution.
APO 3	Ability to correlate different branches of subject to transfer various types of information by working in virtual collaborating platforms 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 (PSO's)	
PSO 1	Graduates will be able to design innovative solution to the critical problems in the areas of Mathematics, Statistics and Computer Science with social and ethical dimensions.
PSO 2	Graduates will be able to handle big data and formulate competitive strategies.
PSO3	Graduates will be able to develop theory and relevant research output with data visualization which will help to solve the problems relating to industries.

VII. Curriculum Structure for M.Sc Mathematics

Course Components, Credits & Marks Distribution

	Basic Structure: Distribution of Courses	Number of Courses	Total Marks	Total Credits
1	DSC – Discipline Specific Courses	20	1850	72
2	DSE – Discipline Specific Electives	2	200	10
3	GEC – Generic Elective Courses	2	200	8
	DTC – Drive Through Courses (SWAYAM-NPTEL, Coursera, Any courses certified by statutory bodies, etc)	Any number	-	Addl. Credits
Total			**2250**	**90**

Group 1. Discipline Specific Courses (DSCs) (I & II Semesters)

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. It includes Major project.

S. No.	Course Code	Course Title	Semester	Contact Hours	Credits	Marks
1	23MAP01	**DSC 1**: Algebra	**I**	**6**	**4**	100
2	23MAP02	**DSC 2**: Real Analysis	**I**	**6**	**4**	100
3	23MAP03	**DSC 3:** Ordinary Differential Equations	**I**	**6**	**4**	100
4	23MAP04	**DSC 4**: Graph Theory	**I**	**5**	**4**	100
5	23MAP05	**DSC 5**: Statistical Data Analysis	**I**	**5**	**4**	100
6	23MAP06	**DSC 6: Practical –** Statistical Data Analysis using R	**I**	**2**	**2**	50
7	23MAP07	**DSC 7**: Advanced Linear Algebra	**II**	**6**	**4**	100
8	23MAP08	**DSC 8**: Partial Differential Equations	**II**	**6**	**4**	100
9	23MAP09	**DSC 9**: Fluid Dynamics	**II**	**5**	**4**	100
10	23MAP10	**DSC 10: Self – Study** Excel Macros	**II**	**2**	**2**	50

Group 2. Discipline Specific Elective (DSEs) (I & II Semesters)

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 TWO courses from the following list.

S. No.	Course Code	Course Title	Ownership Department	Contact Hours	Credits	Marks
1	23MAP11 23MAP12	Numerical Analysis Inferential Statistics	Mathematics	5	5	100

Group 3. Generic Elective Courses (GECs) (I & II Semesters)

Generic Elective Courses are interdisciplinary in nature. They are additional courses based on expertise, specialization, requirements, scope, and need of the department. The student has to subscribe any 2 courses in the following list:

Sl. No.	Course Code	Course Title	Semester	Ownership Department	Contact Hours	Credits	Marks	SD/ EM/ EN	G/L/R/N
1	23GEP09	**GEC-1** RDBMS using Oracle	II	Computer Science	4	2	50	SD	G
	23GEP10	**GET-1:Practical-** RDBMS using Oracle Lab	II		2	2	50	EM	

Group 4.

i) Drive-Through Course (DTC)I & II– 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.

1. SWAYAM-NPTEL

- 4 Additional Credits will be given on submission of the certificate.

2. Coursera

- 4 Additional Credits will be given on completion of Specialization Course with 7 – 8 modules
- 3 Additional Credits will be given on completion of Specialization Course with 5 – 6 modules
- 2 Additional Credits will be given on completion of Specialization Course with 3 – 4 modules

VIII. Semester-wise Scheme

Semester I										
Course Code										
23MAP01	**DSC-1** Algebra	T	3	6	25	75	100	4	SD	N
23MAP02	**DSC-2** Real Analysis	T	3	6	25	75	100	4	SD	N
23MAP03	**DSC-3** Ordinary Differential Equations	T	3	6	25	75	100	4	EM	R
23MAP04	**DSC-4** Graph Theory	T	3	5	25	75	100	4	SD	R
23MAP05	**DSC-5** Statistical Data Analysis	T	3	5	25	75	100	4	EN	G
23MAP06	**DSC-6** Statistical Data Analysis using R	P	3	2	20	30	50	2	EM	G
DTC - I - Additional Credit Courses (NPTEL/Coursera)										
Total					**30**					

Semester II										
Course Code										
23MAP07	**DSC-7** Advanced Linear Algebra	T	3	6	25	75	100	4	EM	L
23MAP08	**DSC-8** Partial Differential Equations	T	3	6	25	75	100	4	EM	R
23MAP09	**DSC-9** Fluid Dynamics	T	3	5	25	75	100	4	EN	L
23MAP10	**DSC-10 Self – Study** Excel Macros	P	3	2	-	50	50	2	EM	N
	DSE-1 Numerical Analysis/ Inferential Statistics	T	3	5	25	75	100	5	EM	G
	GEC-1 RDBMS using Oracle	T	3	4	10	40	50	2	SD	G
23GEP10	**GEC –I Practical:** RDBMS using Oracle Lab	P	3	2	20	30	50	2	EM	G
DTC II : Additional Credit Courses (NPTEL/Coursera)										
Total				**30**			**550**	**23**		

550

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 VI

The Courses focuses the following needs:				
Needs	**G- Global**	**N -Regional**	**R-Regional**	**L-Local**
SD	Skill Development			
EM	Employability			
EN	Entrepreneurship			

Semester-wise Distribution of Marks and Credits:

Semester	Total Marks	Total Credits
I	550	22
II	550	23

OFFERED BY (I & II Semesters)

List of Courses Offered by Computer Science Department

Semester	Course Code								
II	23GEP09	RDBMS using Oracle	Mathematics	T	4	10	40	50	2
	23GEP10	Practical - RDBMS using Oracle Lab	Mathematics	P	2	20	30	50	2
III	23GEP11	Data Mining and Data warehousing	Mathematics	T	4	25	75	100	4

List of courses offered to other departments

Sem	Course Code								Credit	SD/ EM/ EN	L/R/ N/G
I	23GEP01	Discrete Mathematical Structures	M.Sc. (IT/ CS)	T	5	25	75	100	4	SD	G
II	23GEP02	Biological Statistics and Research Methodology	M.Sc. (BI/ BT)	T	4	25	75	100	3	SD	G
II/II/II/ III	23GEP03	Quantitative Aptitude	MA PA/ MSc BI/ MSc BT/MA English	T	4	25	75	100	3	EM	G
II	23GEP04	Quantitative Techniques	M.Com/ M.Com IB	T	5	25	75	100	4	SD	G
II & III	23GEP05	Statistical Methods	MSW/ MA (Public Administration)	T	3	10	40	50	2	SD	G
II/III/ III/III	23GEP06	Practical – Predictive Software Analysis	MSW/ MA (Public Administration) / M.Com/ M.Com IB	P	2	20	30	50	2	EM	G
I	23SSI03	Algebra	I M.Sc SS	T	4	25	75	100	3	SD	G
II	23SSI08	Calculus and Laplace Transforms	I M.Sc SS	T	4	25	75	100	3	SD	G