

SRI KRISHNA ARTS AND SCIENCE COLLEGE

An Autonomous College Affiliated to Bharathiar University
Coimbatore - 641008, Tamil Nadu, India.

LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (LOCF)

B.Sc. Mathematics

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	Prepare industry relevant quality graduates with programming and critical AEC skills to serve the domestic and global community.
PEO 2	Disseminate the conceptual knowledge in the concerned discipline for societal development and transformation.
PEO 3	Develop as a capable technical industry leader with outstanding communication skills.
PEO 4	Become technically competent in the field of computer science with a passion for lifelong learning.

I. PROGRAMME LEARNING OUTCOMES (PLOs)

No.	The Graduates of B.Sc Mathematics Programme will be able to:
PLO1	Ability to apply knowledge of mathematics to the solutions of complex problems in all fields. (Critical Thinking) (Cognitive)
PLO2	Graduates will equip with skills and knowledge to get employment in industry / institution as well as government departments by imparting the computational skills. (Cognitive)
PLO3	Graduates will have capability to work in a team to become leaders and entrepreneurs with ethical responsibility. (Psychomotor)
PLO4	Graduates will be motivated to pursue higher education in various universities across the globe.
PLO5	Imbibe effective scientific and/or technical communication in both oral and writing. (Affective)
PLO6	To encourage the use of relevant mathematical software's like LaTeX, MATLAB, and further the use of the R-programming, PYTHON to the expectations of Industry 4.0 and 5.0. (Digital Skills) (Affective)
PLO7	An ability to develop and conduct appropriate experimentation, analyze and interpret data by using statistical tools (HOT) (Cognitive)
PLO8	Demonstrate effective leadership skills to work efficiently in a competitive domestic and global environment. (Affective)
PLO9	Apply the Mathematical concepts, in all the fields of learning including higher research, and recognize the need and prepare for lifelong learning . (Affective)
PLO10	Enhance entrepreneurial skills and professional development through consultancy and extension services at a competitive level. (Affective)
PLO11	Apply ethical principles and commit to professional ethics, responsibilities and norms in the society. (Affective)

II. PROGRAMME LEARNING OUTCOMES VS GRADUATE ATTRIBUTES VSTAXONOMY OF VERBS														
PLO	Graduate Attributes											Blooms		
	Knowledge	Critical Thinking	Practical Skills	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											√			√

I. PROGRAMME LEARNING OUTCOMES 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		√		

III. ADDITIONAL PROGRAMME OUTCOMES (APOs)	
APO 1	Graduates will have ability with good IQ and EQ (Intelligent Quotient and Emotional Quotient)
APO 2	Graduates will have an ability to virtually collaborate.
APO 3	Graduates will have an ability to o effectively use social media for productive purposes.
APO 4	Graduates will have critical thinking and innovative skills to perform given task in their profession.
APO 5	Graduates will have a good distinct footprint.

IV. PROGRAMME SPECIFIC OUTCOMES (PSO's)

PSO 1	Understand the concepts and methodologies in the field of mathematical sciences and apply the min Mathematical and Statistical applications such as Business, Scientific Research and Technological Computations.
PSO 2	Apply techniques and tools of computational science to provide real time solutions with latest applications.

VII. Curriculum Structure for B.Sc Mathematics**Course Components, Credits & Marks Distribution**

Part No	Group	Basic Structure: Distribution of Courses	Number of Courses	Total Marks	Total Credits
I - III	1	AEC – Ability Enhancement Courses	10	1000	24
III & IV	2	DSC – Discipline Specific Courses	15	1500	60
	3	DSE – Discipline Specific Electives	10	1000	40
	4	GEC – Generic Elective Courses	4	400	12
	5	SEC – Skill Enhancement Courses	2	100	4
IV	6	ANCC I & II – Audit Non-Credit Courses	3	-	-
V		ANCC III – Audit Non-Credit Courses	1	Completed	
-	7	DTC – Drive Through Courses (SWAYAM-NPTEL, Coursera, Any courses certified by statutory bodies, etc)	Any number	-	Addl. Credits
Total				4000	140

Group 1. Ability Enhancement Courses (AECs) (I & II Semesters)

AEC are the courses based upon the content that leads to knowledge enhancement. Ability Enhancement Courses (AEC) are the following:

S. No.	Course Code	Course Title	Semester	Ownership Department	Contact Hours	Credits	Marks
1	23AEC02/ 23AEC07/ 23AEC11	AEC Part I: Language – I: Tamil - I - Tamil Aazhi / Hindi-I/ French-I	I	Language Dept.	6	3	100
2	23AEC22	AEC Part II: English-I: English for Professional Communication	I	English Dept.	4	3	100
3		AEC Part I:	II	Language	6	3	100

	23AEC04/ 23AEC08/ 23AEC12	Language – II: Tamil-II - Sudar Tamil / Hindi-II/ French-II		Dept.			
4	23AEC24	AEC Part II: English – II: Campus to Corporate	II	English Dept	4	3	100
5	23AEC32	AEC Part III: Academic Skills for Mathematics	II	Maths Dept.	2	2	100

Group 2. 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 six 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	23MAU01	DSC 1: Classical Algebra	I	4	4	100
2	23MAU02	DSC 2: Calculus	I	4	4	100
3	23MAU05	DSC 3: Analytical Geometry and Vector Calculus	II	6	4	100

Group 3. 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 TEN courses from the following list.

S. No.	Course Code	Course Title	Ownership Department	Semester	Contact Hours	Credits	Marks
1	23MAU03A	DSE1: Mathematical Statistics-I	Mathematics	I	3	3	50
	23MAU03B	DSE 1: Practical Mathematical Statistics - I			2	2	50
	23MAU04A	DSE 1: Applied and Computational Statistics			3	3	50
	23MAU04B	DSE 1: Practical - Applied and Computational Statistics			2	2	50
2	23MAU06A	DSE 2: Mathematical Statistics- II		II	3	3	50
	23MAU06B	DSE 2: Practical -Mathematical			2	2	50

		Statistics- II						
	23MAU07A	DSE 2: Statistical Quality Control			3	3	50	
	23MAU07B	DSE 2: Practical Statistical Quality Control			2	2	50	

Group 4. 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 4 courses in the following list:

Sl. No.	Course Code	Course Title	Sem ester	Ownership Department	Contact Hours	Credits	Marks	SD/EM/EN	G/L/R/N
1	23GEU20A	Programming in C and Data Structures	I	Computer Applications	3	2	50	EM	G
	23GEU20B	Programming in C and Data Structures Lab			2	2	50	EM	G
	23GEU21A	Programming in C++			3	2	50	EM	G
	23GEU21B	Programming in C++ Lab			2	2	50	EM	G
2	23GEU22A	JAVA Programming	II		3	2	50	EM	G
	23GEU22B	JAVA Programming Lab			2	2	50	EM	G
	23GEU23A	Web Development using PHP			3	2	50	EM	G
	23GEU23B	Web Development using PHP Lab			2	2	50	EM	G

Group 5 : Skill Enhancement Courses(SEC)

SEC I : Compulsory Course : Talent Enhancement Course : Career Guidance

SEC II : A Bucket of Skill based Courses are offered for the Under Graduate programmes aimed at imparting advanced skill. A Student has to subscribe one course from list offered by the department.

Courses Offered by Nan Mudhalvan Scheme/Certification in Core Area/Department offered Certification Course.

Group 6. Audit Non-Credit Courses (ANCC)

Non-Credit Courses are intended for students who want to gain general knowledge, learn a new skill, upgrade existing skills, enrich their understanding of a wide range of topics, or develop personal interests. A student has to complete any two courses during Semester I and II.

Part IV- ANCC		
S. No.	Course Code	Course Name
Semester I - ANCC 1		
1.	23ANC01	Environmental Studies
Semester II - ANCC 2 - Values & Ethics		
2.	23ANC02	Human Rights
3.	23ANC03	Women's Rights
4.	23ANC04	Yoga for Human Excellence
5.	23ANC05	Indian Culture and Heritage
6.	23ANC06	Introduction to Cyber Security
7.	23ANC07	Consumer Protection
8.	23ANC08	Constitution of India
9.	23ANC09	Waste Management
10.	23ANC10	Cyber Ethics

Group 7.**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

3. Any courses certified by statutory bodies.**ii) Drive-Through Course (DTC – III) – To be Completed****Internship Training/Mini Project/ Spoken Tutorial/Economic Talent test etc.**

Students individually or with the maximum of four members per batch should take up either Internship training or mini project for a period of fifteen days during IV Semester vacation. The report will be evaluated and viva-voce examination will be conducted during 5th semester.

Otherwise, the students have to complete one spoken tutorial course or any certification course suggested by the department.

VIII. Semester-wise Scheme

Semester I										
Course Code	Course Title	T/P/E	ESE Dur. Hrs	Ins. Hrs/Week	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	G/L/R/N
23AEC02/ 23AEC07/ 23AEC11	AEC PART I: Language I: Tamil-I - Tamil Aazhi/ Hindi - I/ French-I	T	3	6	25	75	100	3	SD	R/ N/ G
23AEC22	AEC PART II: English-I: English for Professional Communication	T	3	4	25	75	100	3	EM	G
23MAU01	DSC1: Classical Algebra	T	3	4	25	75	100	4	SD	G
23MAU02	DSC 2: Calculus	T	3	4	25	75	100	4	SD	G
23MAU03A	DSE 1: Mathematical Statistics – I	E	3	3	10	40	50	3	EM	G
23MAU03B	DSE 1: Practical Mathematical Statistics – I			2	10	40	50	2	EM	G
23MAU04A	DSE 1: Applied and Computational Statistics	E		3	10	40	50	3	EM	G
23MAU04B	DSE 1: Practical – Applied and Computational Statistics			2	10	40	50	2	EM	G
23GEU20A	GEC 1: Programming in C and Data Structures	E	3	3	10	40	50	2	EM	G
23GEU20B	GEC 1: Programming in C and Data Structures Lab			2	10	40	50	2	EM	G
23GEU21A	GEC 1: Programming in C++	E		3	10	40	50	2	EM	G
23GEU21B	GEC 1: Programming in C++ Lab			2	10	40	50	2	EM	G

DTC - I - Additional Credit Courses (NPTEL/Coursera)								4		
23ANC01	ANCC-1 (NF2F) Environmental Studies	T	-	2	-	-	Completed			
Total				30			600	23 + 4		
Semester II										
Course Code	Course Title	T/P/E	ESE Dur. Hrs	Ins. Hrs/Week	CIA Marks	ES Marks	Total Marks	Credits	SD/EM/EN	G/L/R/N
23AEC04/ 23AEC08/ 23AEC12	AEC - PART I : Language II: Tamil-II - Sudar Tamil/ Hindi-II/ French-II	T	3	6	25	75	100	3	SD	R/ N/ G
23AEC24	AEC - PART II: English - II: Campus to Corporate	T	3	4	25	75	100	3	EM	G
23AEC32	AEC Part III: Academic Skills for Mathematics	T	3	2	100	-	100	2	SD	G
23MAU05	DSC 3: Analytical Geometry and Vector Calculus	T	3	6	25	75	100	4	SD	G
23MAU06A	DSE 2: Mathematical Statistics- II			3	10	40	50	3	EM	N
23MAU06B	DSE 2: Practical - Mathematical Statistics- II	E	3	2	10	40	50	2	EM	N
23MAU07A	DSE 2: Statistical Quality Control			3	10	40	50	3	EM	G
23MAU07B	DSE 2: Practical -Statistical Quality Control	E		2	10	40	50	2	EM	G
23GEU22A	GEC 2 : JAVA Programming			3	10	40	50	2		
23GEU22B	GEC 2 : JAVA Programming Lab	E	3	2	10	40	50	2	EM	G
23GEU23A	GEC 2 : Web Development using PHP			3	10	40	50	2		
23GEU23B	GEC 2 : Web Development	E	3	2	10	40	50	2	EM	G

	using PHP Lab									
DTC II : Additional Credit Courses (NPTEL/Coursera)								4		
23ANC02	ANCC-2 (NF2F) Values & Ethics: HUMAN RIGHTS	T	-	2	-	-	Completed			
Total				30			600	21+4	EN	R
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	600	23+4
II	600	21+4

OFFERED BY (I & II Semesters)**List of Courses Offered by Maths Department**

Se m	Course Code	Course Name	Programme	T/ P/ E	Ins. hrs	CIA	ES	Total Marks	Credit	SD/ EM/ EN	L/R/ N/G
I	23GEU01	Mathematics-I	ECS	T	4	25	75	100	4	SD	G
I	23GEU03	Statistics for Management	BBA/BBA CA/BBA Logistics/BSC ISM)	T	5	25	75	100	3	EM	G
I	23GEU04	Mathematics for Management	BBA/BBA CA/BBA Logistics/BSC ISM)	T	5	25	75	100	3	EM	G
I	23GEU07	Probability and Statistics	B.Sc CS with Cognitive Systems	T	5	25	75	100	3	EM	G
I	23GEU09	Statistics for Machine Learning	B.Sc AI & DS	T	5	25	75	100	3	EM	G
I	23GEU11	Mathematical Foundation for Computer Science	B.Sc., CS/IT/CT/BC A/SS/CSA	T	5	25	75	100	3	EM	G
I	23COU04/ 23CCU04/ 23CIU04/ 23BPU04/ 23CFU04/ 23CNU04/ 23CEU04/ 23CBU04/ 23CYU04	Business Mathematics	All commerce streams except B.COM PA	T	5	25	75	100	4	EM	G
I	23CPU04	Business Mathematics and Logical Reasoning	B.Com PA	T	5	25	75	100	3	EM	G
II	23GEU02	Mathematics-II	ECS	T	4	25	75	100	4	SD	G
II	23GEU05	Operations Research for Management	BBA/BBA CA/BBA Logistic	T	5	25	75	100	4	EM	G

II	23GEU06	Mathematics for Business	BSc ISM	T	5	25	75	100	4	SD	G
II	23GEU08	Discrete Mathematics	BSc CS with Cog Sys	T	5	25	75	100	3	SD	G
II	23GEU10	Linear Algebra for Machine Learning	B.Sc AI & DS	T	5	25	75	100	3	SD	G
II	23GEU12	Numerical Methods and Statistics	B.Sc., CS/IT/CT/BCA/SS/ CSA	T	5	25	75	100	3	SD	G
II	23GEU13A	Biostatistics	B.Sc. (BT/MB)	E	3	10	40	50	2	EN	G
	23GEU13B	Practical: Biostatistics Lab			2	10	40	50	2	EN	G
II	23GEU14A	Statistics for Bioscience		E	3	10	40	50	2	EN	G
	23GEU14B	Practical : Statistics for Bioscience Lab			2	10	40	50	2	EN	G
II	23GEU15	Business Statistics and Applications	All commerce streams except B.COM PA	T	5	25	75	100	3	EM	G
II	23GEU16	Business Statistics and Logical Reasoning	B.Com PA	T	5	25	75	100	3	EM	G

List of courses offered by Computer Application Department

Sem	Course Code	Course Name	Program me	T/P/E	Ins. Hrs	CI A	ES E	Total Marks	Cre dit	SD/EM/EN	L/R/N/G
I	23GEU20A	Programming in C and Data Structures	B.Sc., Mathematics	E	3	10	40	50	2	EM	G
	23GEU20B	Programming in C and Data Structures Lab			2	10	40	50	2	EM	G
	23GEU21A	Programming in C++		E	3	10	40	50	2	EM	G
	23GEU21B	Programming in C++ Lab			2	10	40	50	2	EM	G
II	23GEU22A	JAVA Programming		E	3	10	40	50	2	EM	G
	23GEU22B	JAVA Programming Lab			2	10	40	50	2	EM	G

	23GEU23A	Web Development using PHP			3	10	40	50	2	EM	G
	23GEU23B	Web Development using PHP Lab		E	2	10	40	50	2	EM	G