MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE

(An Autonomous College)

Affiliated to Periyar University, Salem | Accredited by **NAAC** with '**A**' Grade

Recognized by **UGC** under Section 2(f) & 12 (B)

ESTD-1994

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous)

A UNIT OF VANETRA GROUP

Learn. Lead

DEGREE OF BACHELOR OF SCIENCE

Learning Outcomes - Based Curriculum Framework

- Choice Based Credit System

Syllabus for B.Sc.,Mathematics

(Semester Pattern)

(For Candidates admitted from the academic year 2023-2024 and onwards)

Regulation and Syllabus

for B.Sc., Mathematics

(With effect from the Academic Year 2023-24)

Vision:

To redefine the scope of higher education by infusing into each of our pursuits, initiatives that will encourage intellectual, emotional, social and spiritual growth, thereby nurturing a generation of committed, Knowledgeable and socially responsible citizens.

Mission:

*To Ensure State of the world learning experience

*To Espouse value based Education

*To Empower rural education

*To Instill the sprite of entrepreneurship and enterprise

*To create a resource pool of socially responsible world citizens

QUALITY POLICY

To Seek – To Strive – To Achieve greater heights in Arts and Science, Engineering, Technological and Management Education without compromising on the Quality of Education.

DEPARTMENT OF MATHEMATICS

Vision:

* To train the students through Mathematical Analysis and Research of holistic persons to promote better living conditions of the under privileged.

Mission:

* To learn Mathematical concepts and develop capability through indications.
* To instill the spirit of humanity through value based training

PREAMBLE

The curriculum of B.Sc. Mathematics is structured in a way that the students acquire in-depth knowledge to perceive the principles of the core. Basics in Algebra, Calculus, Analytical Geometry, Differential Equations and Transform Techniques are covered exclusively to prepare the students to proceed to the next level of Higher Mathematics of Linear Algebra, Real and Complex Analysis, Mechanics. A list of varied electives namely, Operations Research, Graph Theory, Number Theory, Programming Language 'C', Mathematical Modelling, Programming with Python are furnished to bridge between the Main and Applied Mathematics. The comprehensive curriculum design yields an excellent career opportunity in Research, Education, Public and Private Sectors, Business sectors, Banking, IT Industries and in every domain of contemporaries.

PROGRAMME LEARNING OUTCOME

NATURE AND EXTENT OF THE PROGRAMME

Mathematics is the culmination of in-depth of knowledge of Algebra, Calculus, Differential equations and several other branches of Mathematics. This also leads to selected areas like Computer science and Statistics. Mathematics is a diverse discipline that deals with data, *measurement* and observations from science, with inference, deduction and proof and with mathematical models of natural phenomena of human behaviour and of social systems.

AIM OF THE PROGRAMME

The aim of the undergraduate degree in Mathematics is to

- develop broad and balanced knowledge and understanding of definitions, concepts, principles and theorems.
- enhance the ability of learners to apply the knowledge and skills acquired by them during the programme to solve specific theoretical and applied problems in mathematics.
- provide students/learners sufficient knowledge and skills enabling them to undertake further studies in mathematics and its allied areas on multiple disciplines concerned with mathematics.

GRADUATE ATTRIBUTES

The students graduating in this degree must have an intricate knowledge of the fundamentals of Mathematics as applicable to wide ranging contexts. They should have the appropriate skills of Mathematics so as to perform their duties as Mathematician. They must be able to analyze the problems related to Mathematics and come up with most suitable solutions. As Mathematics is an inter – disciplinary subject the students might have to take inputs from other areas of expertise. So the students must develop the spirit of team work. Mathematics is a very dynamic subject and practitioners might have to face several newer problems. To this end, the Mathematicians must be trained to be innovative to solve such newer problems. Several newer developments are taking place in Mathematics. The students aretrained to pick up leads and see the possibility of converting these into products through entrepreneurship. Furthermore, the students are made to interact with industry experts so that they may able to see the possibility of their transition in to entrepreneurs. They are also made aware of the requirements of developing a Mathematics enterprise by having knowledge of patents, copyrights and various regulatory processes to make their efforts a success.

Besides attaining the attributes related to the Profession of Mathematics, the graduates in this discipline should also develop ethical awareness which is mandatory for practicing a scientific discipline including ethics of working in a laboratory and ethics followed for scientific publishing of their research work in future. The students graduating in Mathematics should also develop excellent communication skills both in the written as well as spoken language which is indispensable for them to pursuehigher studies from some of the best and internationally acclaimed universities and research institutions spread across the globe.

GA 1 Analytical Reasoning

GA 2 Critical Thinking

GA 3 Problem Solving Skills

GA 4 Communication Skills

GA 5 Leadership Quality

GA 6 Team work

GA 7 Lifelong Learning

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO1: Graduates will be able to promote learning environment to meet the industry Expectation

PEO2: Graduates will be incorporated the critical thinking with Good Communication and Leadership skills to become a self-employed

PEO3: Graduates will be uphold the human values and environmental sustenance for the betterment of the society.

PROGRAMME OUTCOMES (POs)

PO1: Graduates will acquire dynamic skills through proper perception of the course Objectives that leads to scientific and analytical comprehension of the concepts.

PO2: Graduates will focus on sustainable goals that might bring about spherical Developments

PO3: Graduates will infuse a spirit converging on bricking a team work, interpersonal and administrative skills to think critically and execute Effectively

PO4: Graduates will apply reasoning appropriately to scale the humps in learning and solute them to the core.

PO5: Graduates will engage the skills obtained in independent and collaborative learning as a perennial process.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO-1: Students are able to understand and view mathematical structures.

PSO-2: Students shall acquire Aptitude skills that will help to take up research in pure and applied mathematics.

PSO-3: Students shall learn various techniques to solve numerical problems, think critically and communicate clearly the mathematical concepts and solutions for real world problems.

PSO-4: Students are able to apply positive approach towards Higher Education in Mathematics.

PSO-5: Students are able to be equipped with mathematical modeling ability, problem solving skills, creative talent and power of communication necessary for various kinds of employment.

REGULATIONS (2023-2024)

1. DURATION OF THE PROGRAME

1.1. Three years (six semesters)

1.2. Each academic year shall be divided into two semesters. The odd semesters shall consist of the period from June to November of each year and the even semesters from December to May of each year.

1.3. There shall be not less than 90 working days for each semester.

2. ELIGIBILITY FOR ADMISSION

2.1. Candidate for admission to the first year of B.Sc. Degree Course in Mathematics shall be required to have passed the Higher Secondary Examination with Mathematics as one of the subjects as per norms set by the Government of Tamilnadu or an Examination Accepted as equivalent there to by the syndicate.

3. CREDIT REQUIRMENTS AND ELIGIBILITY FOR AWARD OF DEGREE

3.1. A Candidate shall be eligible for the award of the Degree only if he/she has undergone the prescribed course of study in a College affiliated to the University for a period of not less than three academic years and passed the examinations of all the Six Semesters prescribed earning a minimum of 140 credits as per the distribution given in Regulation for Part I, II, III, IV & V and also fulfilled such other conditions as have been prescribed thereof.

4. COURSE OF STUDY, CREDITS AND SCHEME OF EXAMINATION

4.1. The Course Components and Credit Distribution shall consist of the following:

(Minimum Number of Credits to be obtained)

Part Wise Distribution	Study Components	Credit Distribution
PART I	Tamil or Other Languages	12
PART II	English	12
PART III	Core, Allied, Elective and Project Courses	91
PART IV	i. Basic Tamil/ Advanced Tamil/ NME	04
	ii. Soft Skill Courses / SBEC	10
	iii. Environmental Studies	02
	iv. Value Education	02
	v. Internship	02
	vi. Foundation Course	02
	vii. Professional Competency Skills	02
PARTV	Extension Activity	01
Total Credits		140

4.2 DETAILS OF COURSE OF STUDY OF PARTS I – V

4.2.1 PART I: Tamil and Other Languages Hindi or French at the option of candidates and according to the syllabus and text-books prescribed from time to time:

4.2.2 PART II: English: According to the syllabus and text-books prescribed from time to time

4.2.3 PART III: Core, Allied Project and Elective Courses: As prescribed by the concerned Board of Studies

4.2.4 PART IV:

i. Basic Tamil / Advanced Tamil/NME:

a. Students who have not studied Tamil up to XII STD and have taken any Language other than Tamil in Part I shall take Basic Tamil comprising of Two Courses (level will be at 6th Standard).
b. Students who have studied Tamil up to XII STD and have taken any Language other than Tamil in Part – I shall take Advanced Tamil comprising of Two Courses.
c. Students who have studied Tamil up to XII STD and also have taken Tamil in Part – I shall take Non-Major Elective comprising of Two Courses.

i. Soft Skill Courses/SBEC
ii. Environmental Studies
iii. Value Education
iv. Internship
v. Foundation Course
vi. Professional Competency Skills(Online)

4.2.5 PART V: Extension Activity:

Students shall be awarded a maximum of 1 Credit for Compulsory Extension Service. All the Students shall have to enroll for NSS /NCC/ NSO (Sports & Games) Retract / Youth Red Cross or any other Service Organizations in the College and shall have to put in compulsory minimum attendance of 40 hours which shall be duly certified by the Principal of the College before 31st March in a year. If a student lacks 40 hours attendance in the first year, he or she shall have to compensate the same during the subsequent years.

Those students who complete minimum attendance of 40 hours in one year will get 'half-a- credit and those who complete the attendance of 80 or more hours in Two Years will get 'one credit'. Literacy and Population Education and Field Work shall be compulsory components in the above extension service activities.

4.3. Inclusion of the Massive Open Online Courses (MOOCs)available on SWAYAM and NPTEL

4.3.1 Students can choose the MOOC Course Available on SWAYAM and NPTEL under Core, Elective or Soft skill category. He/ she will be awarded degree only after producing valid certificate of the MOOC course for credit Mobility

5. REQUIREMENTS FOR PROCEEDING TO SUBSEQUENT SEMESTER

5.1 Eligibility: Students shall be eligible to go to subsequent semester only if they earn sufficient attendance as prescribed by the Periyar University.

5.2. Attendance: All Students must earn 75% and above of attendance for appearing for the End Semester Examination.(Theory/Practical)

5.3. Condonation of shortage of attendance: If a Student fails to earn the minimum attendance (Percentage stipulated), the Principals shall condone the shortage of attendance up to a maximum limit of 10% (i.e. between 65% and above and less than 75%) after collecting the prescribed fee for Theory/Practical examination separately, towards the condonation of shortage of attendance. Such fees collected and should be remitted to the University.

5.4. Non-eligibility for condonation of shortage of attendance: Students who have secured less than 65% but more than 50% of attendance are NOT ELIGIBLE for condonation of shortage of attendance and such Students will not be permitted to appear for the regular examination, but will be allowed to proceed to the next year/next semester of the program and they may be permitted to take next University examination by paying the prescribed condonation fee

5.5. Detained students for want of attendance: Students who have earned less than 50% of attendance shall not be permitted to proceed to the next semester and to complete the Program of study. Such Students shall have to repeat the semester, which they have missed by rejoining after completion of final semester of the course, by paying the fee for the break of study as prescribed by the College from time totime.

5.6. Condonation of shortage of attendance for married women students: In respect of married women students undergoing UG programs, the minimum attendance for condonation (Theory/Practical) shall be relaxed and prescribed as 55% instead of 65% if they conceive during their academic career. Medical certificate from the Doctor (D.G.O) from the Government Hospital and the prescribed fee along with attendance details shall be forwarded to the college to consider the condonation of attendance mentioning the category

5.7. Zero Percent (0%) Attendance: The Students, who have earned 0% of attendance, have to repeat the program (by rejoining) without proceeding to succeeding semester and they have to obtain prior permission from the College/University immediately to rejoin the program.

5.8 Transfer of Students and Credits: The strength of the credits system is that it permits inter Institutional transfer of students. By providing mobility, it enables individual students to develop their capabilities fully by permitting them to move from one Institution to another in accordance with their aptitude and abilities by obtaining necessary permission from the university.

5.8.1 Transfer of Students is permitted from one Institution to another Institution for the same program with same nomenclature.

Provided, there is a vacancy in the respective program of Study in the Institution where the transfer is requested.

Provided the Student should have passed all the courses in the Institution from where the transfer is requested.

5.8.2 The marks obtained in the courses will be converted and grades will be assigned as per the College norms.

5.8.3 The transfer students are eligible for classification.

5.8.4 The transfer students are not eligible for Ranking, Prizes and Medals.

5.8.5 Students who want to go to foreign Universities up to two semesters or Project Work with the prior approval of the Departmental/College Committee are allowed to get transfer of credits and marks which will be converted in to Grades as per the University norms and are eligible to get CGPA and Classification; they are not eligible for Ranking, Prizes and Medals.

5.9 Students are exempted from attendance requirements for online courses of the College and MOOC's.

6. EXAMINATION AND EVALUATION

6.1. Register for all subjects: Students shall be permitted to proceed from the First Semester up to Final Semester irrespective of their failure in any of the Semester Examination. For this purpose, Students shall register for all the arrear subjects of earlier semesters along with the current (subsequent) Semester Subjects.

6.2. Marks for Internal and End Semester Examinations for PART I, II, III, and IV

Category	Theory	Practical
Internal Assessment	25	**40**
End semester Examination	**75**	**60**

6.3. Procedure for Awarding Internal Marks

Internal Examination Marks – Theory

Components	Marks
CIA I&II	**15**
Attendance	**5**
Assignment/Quiz	**5**
Total	**25**

6.4 Awarding Marks for Attendance (out of 5)

Percentage of Attendance	Marks
Below 60%	0 marks
60% to 75%	3 marks
75% to 90%	4 marks
Above 90%	5 marks

6.5 Components for Practical CIA.

Components	Marks
CIA -I	**15**
CIA - II	**15**
Observation Note	**05**
Attendance	**5**
Total	**40**

6.6 Components for Practical ESE.

Components	Marks
Completion of Experiments	**50**
Record	**05**
Viva voce	**05**
Total	**60**

6.7 Guidelines for Value Education Yoga and Environmental Studies(Part IV)

6.7.1. The Course Value Education Yoga is to be treated as 100% CIA course which is offered in V Semester for I year UG students.

6.7.2. The Course Environmental Studies is to be treated as 100% CIA course which is offered in IV Semester for I year UG students.

6.7.3 Total Marks for the Course = 100

Components	Marks
Two Tests(2 x30)	**60**
Field visit and report (10+10)	**20**
Two assignments (2 x10)	**20**
Total	**100**

The passing minimum for this course is 40%

6.7.3 In case, the candidate fails to secure 40% passing minimum, he/she may have to reappear for the same in the subsequent odd/even semesters.

6.8 Internship/ Industrial Training, Mini Project and Major Project Work

Internship/Industrial Training		Mini Project	Major Project Work		
Components	**Marks**	**Marks**	**Components**		Marks
CIA*2			**CIA** a) Attendance b) Review / Work Diary*1	10 Marks 30 Marks	**40**
Work Diary	25	-			
Report	50	50			
Viva-voce	25	50			
Examination					
Total	**100**	**100**	**ESE*2** a) Final Report 40Marks b)Viva-voce 20Marks		**60**
			Total		100

*1. Review is for Individual Project and Work Diary is for Group Projects (Group consisting of minimum 3 and maximum 5)

*2 Evaluation of report and conduct of viva voce will be done jointly by Internal and External Examiners

6.9 Guidelines for Professional Competency Skill- Online Mode(Part IV)- Online Exam 3 hours

Components	Marks
100 Objective Type Questions 100*1=100 Marks	**100**

Objective type Questions from Question Bank.

- The passing minimum for this paper is 40%
- In case, the candidate fails to secure 40% passing minimum, he/ she may have to reappear for the same in the subsequent semesters.

QUESTION PAPER PATTERN FOR CIA I, II AND ESE	
(3 HOURS)	**MAXIMUM:75Marks**
SECTION-A (Objective Type) **Answer ALL Questions** ALL Questions Carry EQUAL Marks	(10 x1=10 marks)
SECTION-B (Either or Type) **Answer ALL Questions** ALL Questions Carry EQUAL Marks	(5 x 5 = 25 marks)
SECTION-C (Either or Type) **Answer ALL Questions** ALL Questions Carry EQUAL Marks	(5 x 8 = 40 marks)
(Syllabus for CIA-I 2.5 Unit ,Syllabus for CIA-II All 5 Unit)	

6.6 PASSING MINIMUM

6.6.1 There shall be no passing minimum for Internal.

6.6.2 For external examination, passing minimum shall be 40% [Forty Percentage] of the maximum marks prescribed for the course for each Course/Practical/Project and Viva-Voce.

6.6.2 In the aggregate [External/Internal] the passing minimum shall be of 40%.

6.6.3 He / She shall be declared to have passed the whole examination, if he/she passes in all the Courses and Practical wherever prescribed as per the scheme of the examinations by earning 140 CREDITS in Part I, II, III, IV& V. He/she shall also fulfill the extension activities prescribed earning a minimum of 1 credit to qualify for the Degree.

6.7. SUPPLIMENTARY EXAMINATION:

Supplementary Examinations is conducted for the students who appeared in the final semester examinations. Eligible criteria for appearing in the Supplementary Examinations are as follows:

6.7.1. Eligibility: A Student who is having arrear of only one theory course in any of the semester or two theory course in the Final semester of the UG degree programme alone is eligible for Supplementary Examinations.

6.7.2 Non-eligibility for those completed the program: Students who have completed their Program duration but having arrears are not eligible to appear for Supplementary Examinations.

6.8. RETOTALLING, REVALUATION AND PHOTOCOPY OF THE ANSWER SCRIPTS:

6.8.1. Re-totaling: All UG Students who appeared for their Semester Examinations are eligible for applying for re-totaling of their answer scripts.

6.8.2. Revaluation: All current batch Students who have appeared for their Semester Examinations are eligible for Revaluation of their answer scripts. Passed out candidates are not eligible for Revaluation.

6.8.3. Photo copy of the answer scripts: Students who have applied for revaluation can apply for the Photocopy of answer scripts by paying prescribed fee.

7. CLASSIFICATION OF SUCCESSFUL STUDENTS

RANGE OF MARKS	GRADE POINTS	LETTER GRADE	DESCRIPTION
90-100	9.0-10.0	O	Outstanding
80-89	8.0-8.9	D+	Excellent
75-79	7.5-7.9	D	Distinction
70-74	7.0-7.4	A+	Very Good
60-69	6.0-6.9	A	Good
50-59	5.0-5.9	B	Average
40-49	4.0-4.9	C	Satisfactory
00-39	0.0	U	Re-appear

ABSENT	0.0	AAA	**ABSENT**

7.1 Computation of Grade Point Average (GPA) in a Semester, Cumulative Grade Point Average(CGPA) and Classification

GPA for a Semester: = ∑iCiGi ,∑iCi

That is, GPA is the sum of the multiplication of grade points by the credits of the courses divided by the sum of the credits of the courses in a semester.

CGPA for the entire programme: = ∑n∑iCniGni ,∑n∑iCni That is, CGPA is the sum of the multiplication of grade points by the credits of the entire programme divided by the sum of the credits of the courses of the entire programme

Where,

Ci= Credits earned for course I in any semester,

Gi=GradePointsobtainedforcourseiinanysemestern=Semesterinwhichsuchcourseswere credited.

7.2 Letter Grade and Classification

CGPA	GRADE	CLASSIFICATION OF FINAL RESULT
9.5-10.0	O+	First Class -Exemplary*
9.0 and above but below9.5	O	
8.5 and above but below 9.0	D++	First Class with Distinction*
8.0 and above but below 8.5	D+	
7.5 and above but below 8.0	D	
7.0 and above but below 7.5	A++	First Class
6.5 and above but below 7.0	A+	
6.0 and above but below 6.5	A	
5.5 and above but below 6.0	B+	Second Class
5.0 and above but below 5.5	B	
4.5 and above but below 5.0	C +	Third Class
4.0 and above but below 4.5	C	
0.0 and above but below 4.0	U	Re-appear

*The Students who have passed in the first appearance and within the prescribedsemester of the UG Programme (Major, Allied and Elective courses only) are eligible.

8. RANKING

Students who pass all the examinations prescribed for the Program in the FIRSTAPPEARANCE ITSELF ALONE are eligible for Ranking I, II and III.

9. MAXIMUM PERIOD FOR COMPLETION OF THE PROGRAM TO QUALIFY FOR A DEGREE

9.1. A Student who for whatever reasons is not able to complete the program within the normal period (N) or the Minimum duration prescribed for the programme, may beallowed two years period beyond the normal period to clear the backlog to be qualified for the degree. (Time Span =N+2years for the completion of programme.)

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MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous)

B.Sc., MATHEMATICS abstract under LOCF-CBCS Pattern with effect from 2023-2024 Onwards
Structure of Credit Distribution as per the TANSCHE / UGC Guidelines

S.No	Study Components	Part	Sem I		Sem II		Sem III		Sem IV		Sem V		Sem VI		No.of course	Total Credit
			No.of course	Credit	No.of course	Credit	No.of course	Credit	No.of course	Credit	No.of course	Credit	No.of course	Credit		
1	LANGUAGE - I	I	1	3	1	3	1	3	1	3					4	12
2	LANGUAGE - II	II	1	3	1	3	1	3	1	3					4	12
3	DISCIPLINE SPECIFIC COURSE(DSC)-THEORY	III	2	8	2	8	2	8	2	7	4	16	3	12	15	59
4	GENERIC ELECTIVE COURSES(GEC)-THEORY	III	1	3	1	3	1	3	1	3					4	12
5	GEC PRACTICAL	III			1	2			1	2					2	4
6	DISCIPLINE SPECIFIC ELECTIVE COURSES(DSE)	III									2	6	2	6	4	12
7	PROJECT WORK	III											1	4	1	4
8	INTERNSHIP	IV									1	2			1	2
9	PROFESSIONAL COMPETENCY SKILL	IV											1	2	1	2
10	SKILL ENHANCEMENT COURSES(SEC)-SBEC	IV			1	2	2	4	2	4					5	10
11	NON MAJOR ELECTIVE COURSES(NMEC)	IV	1	2	1	2									2	4
12	FOUNDATION COURSE	IV	1	2											1	2
13	ABILITY ENHANCEMENT COMPULSORY COURSES(AECC)-EVS	IV							1	2					1	2
14	ABILITY ENHANCEMENT COMPULSORY COURSES(AECC)-VALUE EDUCATION - YOGA	IV									1	2			1	2
15	EXTENSION ACTIVITY	V											1	1	1	1
	Cumulative Credits		7	21	8	23	7	21	9	24	8	26	8	25	47	140

Total No.of Subjects	47
Marks	4600

PART	No.of Credits
PART - I	12
PART - II	12
PART - III	91
PART - IV	24
PART - V	1
Grand Total	140

Extra Credit (2+2)	4
	144

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MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE(Autonomous) – Rasipuram
Scheme of Examinations LOCF-CBCS Pattern
(for the Students Admitted from the Academic Year:2023-2024 Onwards)
Programme : B.Sc. MATHEMATICS

S.No	PART	STUDY COMPONENTS	COURSE CODE	TITLE OF THE COURSE	Hrs./W		CREDIT POINTS	MAX.MARKS		
					Lect	Lab		CIA	ESE	TOTAL
SEMESTER - I										
1	I	LANGUAGE-I	23M1UFTA01	TAMIL-I	6	-	3	25	75	100
2	II	LANGUAGE-II	23M1UFEN01	ENGLISH-I	6	-	3	25	75	100
3	III	DSC THEORY - I	23M1UMAC01	ALGEBRA AND TRIGONOMETRY	4	-	4	25	75	100
4	III	DSC THEORY - II	23M1UMAC02	DIFFERENTIAL CALCULUS	4	-	4	25	75	100
5	III	GEC THEORY - I	23M1UPHA01	ALLIED- PHYSICS I	4	-	3	25	75	100
6	III	GEC PRACTICAL - I	23M2UPHAP1	PRACTICAL : ALLIED PHYSICS	-	2	-	-	-	-
7	IV	NMEC - I	23M1UCSN01	FUNDAMENTALS OF INFORMATION TECHNOLOGY	2	-	2	25	75	100
8	IV	FC - I	23M1UMAFC1	BRIDGE MATHEMATICS	2	-	2	25	75	100
				TOTAL	28	2	21	175	525	700
SEMESTER - II										
1	I	LANGUAGE - I	23M2UFTA02	TAMIL-II	6	-	3	25	75	100
2	II	LANGUAGE - II	23M2UFEN02	ENGLISH - II	6	-	3	25	75	100
3	III	DSC THEORY - III	23M2UMAC03	ANALYTICAL GEOMETRY (TWO AND THREE DIMENSIONS)	4	-	4	25	75	100
4	III	DSC THEORY - IV	23M2UMAC04	INTEGRAL CALCULUS	4	-	4	25	75	100

5	III	GEC THEORY - II	23M2UPHA02	ALLIED- PHYSICS II	4		3	25	75	100
6	III	GEC PRACTICAL - I	23M2UPHAP1	PRACTICAL : ALLIED PHYSICS	-	2	2	40	60	100
7	IV	NMEC - II	23M2UCSN02	INTRODUCTION TO HTML	2	-	2	25	75	100
8	IV	SEC THEORY - I	23M2UMAS01	COMPUTATIONAL MATHEMATICS	2	-	2	25	75	100
				TOTAL	28	2	23	215	585	800
SEMESTER - III										
1	I	LANGUAGE - I	23M3UFTA03	TAMIL-III	6	-	3	25	75	100
2	II	LANGUAGE - II	23M3UFEN03	ENGLISH - III	6	-	3	25	75	100
3	III	DSC THEORY - V	23M3UMAC05	VECTOR CALCULUS AND ITS APPLICATIONS	4	-	4	25	75	100
4	III	DSC THEORY - VI	23M3UMAC06	DIFFERENTIAL EQUATIONS AND ITS APPLICATIONS	4	-	4	25	75	100
5	III	GEC THEORY - III	23M3USTA06	ALLIED : STATISTICAL METHODS - I	4	-	3	25	75	100
6	III	GEC PRACTICAL - II	23M4USTAP1	PRACTICAL : ALLIED STATISTICS	-	2	-	-	-	-
7	IV	SEC THEORY - II	23M3UMAS02	STATISTICS WITH EXCEL PROGRAMMING	2	-	2	25	75	100
8	IV	SEC THEORY - III	23M3UMAS03	QUANTITATIVE APTITUDE - I	2	-	2	25	75	100
				TOTAL	28	2	21	175	525	700
SEMESTER - IV										
1	I	LANGUAGE - I	23M4UFTA04	TAMIL-IV	6	-	3	25	75	100
2	II	LANGUAGE - II	23M4UFEN04	ENGLISH-IV	6	-	3	25	75	100
3	III	DSC THEORY - VII	23M4UMAC07	INDUSTRIAL STATISTICS	4	-	3	25	75	100

4	III	DSC THEORY - VIII	23M4UMAC08	ELEMENTS OF MATHEMATICAL ANALYSIS	4	-	4	25	75	100
5	III	GEC THEORY - IV	23M4USTA07	ALLIED : STATISTICAL METHODS - II	4	-	3	25	75	100
6	III	GEC PRACTICAL - II	23M4USTAP1	PRACTICAL : ALLIED STATISTICS	-	2	2	40	60	100
7	IV	SEC THEORY - IV	23M4UMAS04	QUANTITATIVE APTITUDE - II	2	-	2	25	75	100
8	IV	SEC PRACTICAL - I	23M4UMASP1	LATEX PRACTICAL	-	2	2	40	60	100
9	IV	AECC - ENVIRONMENTAL STUDIES*	23M4UEVS01	ENVIRONMENTAL STUDIES	-	-	2	100	-	100
		*SELF STUDY		TOTAL	26	4	24	330	570	900
SEMESTER - V										
1	III	DSC THEORY - IX	23M5UMAC09	ABSTRACT ALGEBRA	5	-	4	25	75	100
2	III	DSC THEORY - X	23M5UMAC10	REAL ANALYSIS	5	-	4	25	75	100
3	III	DSC THEORY - XI	23M5UMAC11	MATHEMATICAL MODELLING	4	-	4	25	75	100
4	III	DSC THEORY - XII	23M5UMAC12	OPTIMIZATION TECHNIQUES	4	-	4	25	75	100
5	III	DSE THEORY - I		ELECTIVE-I	5	-	3	25	75	100
6	III	DSE THEORY - II		ELECTIVE-II	5	-	3	25	75	100
7	IV	AECC - VALUE EDUCATION	23M5UVED01	YOGA	2	-	2	100	-	100
8	IV	INTERNSHIP	23M5UMAIS1	INTERNSHIP	-	-	2	100	-	100
				TOTAL	30	0	26	350	450	800
SEMESTER - VI										
1	III	DSC THEORY - XIII	23M6UMAC13	LINEAR ALGEBRA	5	-	4	25	75	100
2	III	DSC THEORY - XIV	23M6UMAC14	COMPLEX ANALYSIS	5	-	4	25	75	100
3	III	DSC THEORY - XV	23M6UMAC15	MECHANICS	5	-	4	25	75	100
4	III	DSE THEORY - III		ELECTIVE - III	5	-	3	25	75	100

5	III	DSE THEORY - IV		ELECTIVE - IV	5	-	3	25	75	100
6	III	PROJECT WORK	23M6UMAPR1	PROJECT WORK	5	-	4	40	60	100
7	IV	PROFESSIONAL COMPETENCY SKILL	23M6UMAOE1	MATHEMATICS FOR COMPETITIVE EXAMINATIONS	-	-	2	100	-	100
8	V	EXTENSION ACTIVITY	23M6UEXA01	EXTENSION ACTIVITY	-	-	1	-	-	-
				TOTAL	30	0	25	265	435	700
				OVERALL TOTAL	170	10	140	1510	3090	4600
		EXTRA CREDIT COURSE	23M6UMAEC1	MOOC Courses offered in SWAYAM / NPTEL	-	-	2	-	-	-
		EXTRA CREDIT COURSE		VALUE ADDED COURSE	-	-	2	-	-	-

HOD **MEMBER SECRETARY ACADEMIC COUNCIL** **PRINCIPAL**

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M1UMAC01	ALGEBRA AND TRIGONOMETRY	DSC THEORY - I	I	4	4	-	-	4
Objective	To get Basic ideas on the Theory of Equations, Matrices and Number Theory. Knowledge to find expansions of trigonometry functions, solve theoretical and applied problems.							

Unit	Course Content	Knowledge Levels	Sessions
I	Reciprocal Equations-Standard form–Increasing or decreasing the roots of a given equation- Removal of terms– related problems. (Book1 – Chapter6: Sections 16,17,19)	K1	10
II	Summation of Series: Binomial– Exponential –Logarithmic series (Theorems without proof) – Approximations - related problems. (Book1–Chapter3: Sections 10,14; Chapter4: Sections-1,2,3,5,7,8,9, 11)	K2	10
III	Inverse of a square matrix up to order 3, Characteristic equation – Eigen values and Eigen Vectors-Similar matrices - Cayley – Hamilton Theorem (Statement only) - Finding powers of square matrix, Diagonalization of square matrices - related problems. (Book2 – Chapter2: Sections -8,16)	K2,K3	10
IV	Expansions of sinnθ, cosnθ in powers of sinθ, cosθ - Expansion of tannθ in terms of tan θ, Expansions of $\cos^n\theta$, $\sin^n\theta$, $\cos^m\theta\sin^n\theta$ – Expansions of tan(θ1+θ2+,…,+θn)-Expansions of sinθ, cosθ and tanθ in terms of θ - related problems. (Book 3 – Chapter 3: Sections 1 to 5)	K4	9
V	Hyperbolic functions – Relation between circular and hyperbolic functions Inverse hyperbolic functions, Logarithm of complex quantities, Summation of trigonometric series - related problems. (Book3 – Chapter 4; Chapter 5; Chapter 6: Sections 1, 3, 3.1 Related problems.)	K4,K5	9
	CO1: Remember the reciprocal equations.	K1	
	CO2: Understand the sum of binomial, exponential and logarithmic series	K2	

Course Outcome	**CO3:**Determineto Find Eigen values, eigen vectors, verify Cayley – Hamilton theorem and diagonalize a given matrix	K3
	CO4: Analyze the powers and multiples of trigonometric functions in terms of sine and cosine	K4
	CO5: Evaluate the relationship between circular and hyperbolic functions and the summation of trigonometric series	K5

Learning Resources	
Text Books	1. Manickavasagam Pillai, T.K., T. Natarajan and Ganapathy KS – Algebra Vol-I, Viswanathan Publishers and Printers Pvt Ltd., - 2008. 2. Manickavasagam Pillai, T.K., T. Natarajan and Ganapathy KS – Algebra Vol-II, Viswanathan Publishers and Printers Pvt Ltd., - 2008. 3. Manichavasagam Pillai, T.K. and S. Narayanan, Trigonometry–Viswanathan Publishers and Printers Pvt. Ltd. 2013.
Reference Books	1.W.S. Burnstine and A.W. Panton, Theory of equations 2. David C. Lay, Linear Algebra and its Applications, 3rd Ed., Pearson Education Asia, Indian Reprint, 2007 3.G.B. Thomas and R.L. Finney, Calculus, 9th Ed., Pearson Education, Delhi, 2005 4.C.V.Durell and A. Robson, Advanced Trigonometry, Courier Corporation, 2003 5.J.Stewart, L. Redlin, and S. Watson, Algebra and Trigonometry, Cengage Learning, 2012. 6.Calculus and Analytical Geometry, G.B. Thomas and R. L. Finny, Pearson Publication, 9th Edition, 2010.
Website Link	1.https://www.youtube.com/watch?v=H3ewmorcYjU 2.https://www.youtube.com/watch?v=0XqIOw-hdo4 3.https://www.youtube.com/watch?v=uMXcKY_w3w4

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**	
23M1UMAC01	ALGEBRA AND TRIGONOMETRY	DSC THEORY - I	I	4	4	-	-	4	

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	S	S	S	S
CO2	S	S	S	M	S	S	S	S	M	M
CO3	S	M	S	M	S	S	S	S	S	S
CO4	S	S	S	M	S	S	S	S	S	M
CO5	S	S	S	M	S	S	S	S	M	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
Mrs.P.SUBHA	Dr.K.LOGAARASI	Head CDC

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M1UMAC02	DIFFERENTIAL CALCULUS	DSC THEORY - II	I	4	4	-	-	4

Objective	To understand the basic skills of differentiation, successive differentiation, and their applications. Basic knowledge on the notions of curvature, evolutes, involutes and polar co-ordinates and in solving related problems.

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**Successive Differentiation**: Introduction (Review of basic concepts) – The n^{th}derivative – Standard results – Fractional expressions – Trigonometrical transformation – Formation of equations involving derivatives – Leibnitz formula for the n^{th} derivative of a product. (Chapter3: Sections 1.1 to 1.6 and 2.1, Related problems.)	K1,K2	10
II	**Partial Differentiation:** Partial derivatives – Successive partial derivatives – Function of a function rule – Total differential coefficient – A special case – Implicit Functions. (Chapter8: Sections 1.1 to 1.5.)	K2	10
III	**PartialDifferentiation(Continued)**:Homogeneous functions – Partial derivatives of a function of two variables – Maxima and Minima of functions of two variables - Lagrange's method of undetermined multipliers. (Chapter8: Sections 1.6, 1.7 and Sections 4, 5.)	K3,K4	10
IV	**Envelope:**Method of finding the envelope – Another definition of envelope – Envelope of family of curves which are quadratic in the parameter. (Chapter10: Sections 1.1 to 1.4.)	K4	9
V	**Curvature:** Definition of Curvature – Circle, Radius and Centre of Curvature –Cartesian formula for the radius of curvature – The coordinates of the centre of curvature- Evolutes and Involutes – Radius of Curvature in Polar Co-ordinates. (Chapter10: Sections 2.1 to 2.6)	K5	9
Course Outcome	**CO1:** Remember the n^{th} derivative, form equations involving derivatives and apply Leibnitz formula.	K1	
	CO2: Understand the partial derivative and total derivative coefficient.	K2	
	CO3: Determine maxima and minima of functions of two variables and to use the Lagrange's method of undetermined multipliers.	K3	
	CO4: Analyze the envelope of a given family of curves.	K4	
	CO5: Evaluate the evolutes and involutes and to find the radius of curvature using polar co-ordinates.	K5	

Learning Resources				
Text Books	1. S. Narayanan and T.K. Manicavachagom Pillay, Calculus-Volume I,(2011), S. Viswananthan Printers Pvt. Ltd.			
Reference Books	1. H.Anton, I.Birens and S.Davis, Calculus, John Wiley and Sons, Inc., 2002. 2. G.B.Thomas and R.L. Finney,Calculus, Pearson Education, 2010. 3. M.J. Strauss, G.L. Bradley andK. J. Smith, Calculus, 3rd Ed.,Dorling Kindersley(India)P.Ltd.(PearsonEducation), Delhi,2007. 4. R.Courant and F.John, Introduction to Calculus and Analysis(VolumesI&II),Springer-Verlag,New York,Inc.,1989. 5. T.Apostol, Calculus, VolumesI and II. 6. S.Goldberg,Calculus and mathematical analysis.			
Website Link	1. https://youtu.be/f2CWlgCH58Q 2. https://youtu.be/jGwA4hknYp4 3.https://youtu.be/H9xxLXYSrCw			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards										
Course Code	**Course Title**			**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M1UMAC02	DIFFERENTIAL CALCULUS			DSC THEORY - II	I	4	4	-	-	4

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	L	S	L	L	S	M	S	L	M
CO2	M	L	S	L	L	S	M	M	L	M
CO3	S	M	S	M	L	S	S	M	M	M
CO4	S	M	S	M	S	S	S	M	S	S
CO5	S	M	S	M	S	M	M	S	S	M
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	**Verified By**	**Approved By**
Mrs.R.MALATHI	Dr.K.LOGAARASI	Head CDC

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M2UMAC03	ANALYTICAL GEOMETRY (TWO AND THREE DIMENSIONS)	DSC THEORY - III	II	4	4	-	-	4
Objective	Necessary skills to analyze characteristics and properties of two- and three-dimensional geometric shapes. To present mathematical arguments about geometric relationships. To solve real world problems on geometry and its applications.							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	Pole, Polar - conjugate points and conjugate lines – diameters – conjugate diameters of an ellipse - semi diameters- conjugate diameters of hyperbola.(Book1: Chapter9, 10)	K1	10
II	Polar coordinates: General polar equation of straight line – Polar equation of a circle given a diameter, Equation of a straight line, circle, conic – Equation of chord, tangent, normal. Equations of the asymptotes of a hyperbola. (Book2: Chapter9)	K2	10
III	System of Planes-Length of the perpendicular–Orthogonal projection.(Book3: Chapter2:Sections 2.5,2.7,2.9)	K2,K3	10
IV	Representation of line–angle between a line and a plane – co – planar lines–shortest distance between two skew lines –length of the perpendicular–intersection of three planes. (Book3: Chapter3:Sections 3.1, 3.2, 3.4, 3.6, 3.7, 3.8)	K4	9
V	Equation of a sphere-general equation-section of a sphere by a plane-equation of the circle- tangent plane- angle of intersection of two spheres- condition for the orthogonality- radical plane. (Book3: Chapter6:Sections 6.1, 6.2, 6.3, 6.4, 6.6, 6.7, 6.8)	K4,K5	9

Course Outcome	**CO1:** Remember the Pole, polar for conics, diameters, conjugate diameters for ellipse and hyperbola.	K1	
	CO2: Understand the polar equations of straight line and circle, equations of chord, tangent and normal and to find the asymptotes of hyperbola.	K2	
	CO3: Determine the system of Planes.	K3	
	CO4: Analyze the system of Straight lines.	K4	
	CO5: Evaluate the angle of intersection of two spheres.	K5	

Learning Resources

Text Books	1. Vittal P.R. and Malini V, Algebra, Analytical Geometry andTrignometry,Margam Publications, India.2018. 2. Manicavachagom Pillay T.K.and Natarajan T, A Text book of Analytical Geometry Part I-Two Dimensions, S.Viswananthan Printers Pvt. Ltd.1996. 3. Shanti Narayan and Mittal P.K., Analytical Solid Geometry, S Chand Publishing, 2021
Reference Books	1. S. L. Loney, Co-ordinate Geometry. 2. Robert J. T. Bell, Co-ordinate Geometry of Three Dimensions. 3. William F. Osgood and William C. Graustein, Plane and Solid Analytic Geometry, Macmillan Company, NewYork, 2016. 4. Calculus and Analytical Geometry, G.B. Thomas and R. L. Finny, Pearson Publication, 9th Edition, 2010. 5. Robert C. Yates, Analytic Geometry with Calculus, Prentice Hall, Inc., New York, 1961. 6. Earl W. Swokowski and Jeffery A. Cole, Algebra and Trigonometry with Analytic Geometry, Twelfth Edition, Brooks/Cole, Cengage Learning, CA, USA, 2010. 7. William H. McCrea, Analytical Geometry of Three Dimensions, Dover Publications, Inc, New York, 2006. 8. John F. Randelph, Calculus and Analytic Geometry, Wadsworth Publishing Company, CA, USA, 1969. 9. Ralph Palmer Agnew, Analytic Geometry and Calculus with Vectors, McGraw-Hill Book Company, Inc. New York, 1962.
Website Link	1. https://www.youtube.com/watch?v=cJ9XU7fi56c 2. https://www.youtube.com/watch?v=aSdaT62ndYE 3. https://www.youtube.com/watch?v=wtpwM2y86So

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc-Mathematics Syllabus LOCF- CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**	
23M2UMAC03	ANALYTICAL GEOMETRY (TWO AND THREE DIMENSIONS)	DSC THEORY - III	II	4	4	-	-	4	

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	S	S	M	M
CO2	S	S	S	M	S	S	M	S	S	M
CO3	S	S	S	M	S	S	S	S	M	M
CO4	S	S	M	S	S	S	S	S	S	M
CO5	S	S	S	M	S	S	S	S	M	M
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
Mrs.P.SUBHA	Dr.K.LOGAARASI	Head CDC

B.Sc -Mathematics Syllabus LOCF-CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UMAC04	INTEGRAL CALCULUS	DSC THEORY - IV	II	4	4	-	-	4
Objective	To understand the basics of Integration and to use its techniques for Geometrical and Physical application related problems.							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	Reduction formulae -Types, integration of product of powers of algebraic and trigonometric functions, integration of product of powers of algebraic and logarithmic functions - Bernoulli's formula. (Chapter1: Sections 13.2 – 13.10,15.1)	K1	10
II	Multiple Integrals - Definition of double integral – Evaluation of double integral – Double integral in polar coordinates - Change of order of integration. (Chapter5: Sections 1, 2.1, 2.2 ,3.1,3.2)	K2	10
III	Triple integrals – Applications of multiple integrals - Volumes of solids of revolution - Areas of curved surfaces – Change of variables- Jacobian. (Chapter5: Sections 4, 5.1 - 5.4, 6.1, 7 and Chapter6: 1.1,1.2)	K3	10
IV	Beta and Gamma functions – Infinite integral – Definitions – Recurrence formula of Gamma functions – Properties of Beta and Gamma functions- Relation between Beta and Gamma functions -Applications. (Chapter7: Sections 1.1 – 1.4,2.1 - 2.3, 3, 4, and 6)	K4	9
V	Geometric Applications of Integration– Areas under plane curves: Cartesian coordinates-Area of a closed curve – Areas in polar coordinates - Centroid – Centre of mass of an arc - Centre of mass of a plane area- Centroid of a solid of revolution. (Chapter 2: Sections 1.1 to 1.4 and Chapter 3: 1.1 to 1.4 Simple Applications)	K5	9
Course Outcome	**CO1:** Knowledge about the integrals of algebraic, trigonometric and logarithmic functions and to find the reduction formulae.	K1	
	CO2: Understanding the double and triple integrals and problems using change of order of integration.	K2	

	CO3: Applying the multiple integrals and to find the areas of curved surfaces and volumes of solids of revolution.	K3
	CO4: Analyze the beta and gamma functions and to use them in solving problems of integration.	K4
	CO5: Evaluate the Geometric and Physical applications of integral calculus.	K5

Learning Resources				
Text Books	1. Narayanan S and Manicavachagam Pillay T.K. Calculus-Volume II, (2006), S. Viswananthan Printers Pvt. Ltd.			
Reference Books	1. H. Anton, I. Birens and S. Davis, Calculus, John Wiley and Sons, Inc., 2002. 2. G.B. Thomas and R.L. Finney, Calculus, Pearson Education, 2007. 3. D. Chatterjee, Integral Calculus and Differential Equations, Tata- McGraw Hill Publishing Company Ltd. 4. P. Dyke, An Introduction to Laplace Transforms and Fourier Series, Springer Undergraduate Mathematics Series, 2001 (second edition).			
Website Link	1. https://www.khanacademy.org/math/integral-calculus 2. https://onlinecourses.nptel.ac.in/noc20_ma07/preview			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc-Mathematics Syllabus LOCF- CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**	
23M2UMAC04	INTEGRAL CALCULUS	DSC THEORY-IV	II	4	4	-	-	4	

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M	S	S	S	S	M
CO2	M	S	S	M	M	S	M	S	S	S
CO3	S	S	S	S	S	M	S	S	S	S
CO4	S	M	M	S	S	S	S	M	S	S
CO5	S	S	S	S	S	M	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
Mrs.B.MOHANAPRIYA	Dr.K.LOGAARASI	Head CDC

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(Autonomous)
Rasipuram - 637408.

B.Sc - Mathematics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M3UMAC05	VECTOR CALCULUS AND ITS APPLICATIONS	DSC THEORY-V	III	4	4	-	-	4
Objective	Students can get the Knowledge about differentiation of vectors and on differential operators and derivatives of vector functions.							

Unit	Course Content	Knowledge Levels	Sessions
I	Vector point function - Scalar point function - Derivative of a vector and derivative of a sum of vectors - Derivative of a product of a scalar and a vector point function - Derivative of a scalar product and vector product. (Chapter 1: Sections 1.1 to 1.5)	K1-K2	10
II	The vector operator 'del', The gradient of a scalar point function - Divergence of a vector - Curl of a vector - solenoidal and irrotational vectors – simple applications. (Chapter 2: Sections 2.1 to 2.7.)	K2	10
III	Laplacian operator, Vector identities - Line integral - simple problems. (Chapter 2: Sections 2.8 and Chapter 3: 3.1, 3.2, 3.3, 3.4)	K3	10
IV	Surface integral - Volume integral – Applications. (Chapter 3: 3.5, 3.6)	K4	9
V	Gauss divergence Theorem, Stoke's Theorem, Green's Theorem in two dimensions – Applications to real life situations. (Chapter 4: 4.1 to 4.5). **Current Trends-*Fractional Calculus and Its Applications ***	K5	9
	*Self Study.		

Course Outcome	**CO1:** List about simple line integrals	K1	
	CO2: Summarize the derivative of vector and sum of vectors, product of scalar and vector point function and to Determine derivatives of scalar and vector products	K2	
	CO3: Use the operator 'del' and to Explain soleonidal and ir-rotational vectors	K3	
	CO4: Compare the surface integrals and volume integrals	K4	
	CO5: Test the theorems of Gauss, Stoke's and Green's(Two Dimension)	K5	

Learning Resources				
Text Books	1. Duraipandian, P and Laxmiduraipandian, Vector Analysis (Revised Edition-Reprint 2005) Emerald Publishers.			
Reference Books	1. J.C. Susan ,Vector Calculus, , (4th edn.) Pearson Education, Boston, 2012. 2. A. Gorguis, Vector Calculus for College Students, Xilbius Corporation, 2014. 3. J.E. Marsden and A. Tromba ,Vector Calculus, , (5th edn.) W.H.Freeman, New York, 1988.			
Website Link	1.https://nptel.ac.in 2.https://www.youtube.com/watch?v=CPVobSZxTNM 3.https://www.youtube.com/watch?v=Cu2prKp3nDc 4.https://www.youtube.com/watch?v=TORt20_HjMY			
Self-Study Material	1.https://nlist.inflibnet.ac.in/search/Author/Home?author=Biagini%2C+Francesca.			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(Autonomous)
Rasipuram - 637408.

B.Sc. – Mathematics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M3UMAC05	VECTOR CALCULUS AND ITS APPLICATIONS	DSC THEORY-V	III	4	4	-	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	M	S	S	S	S	S	S	M
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	M	S	M	S	S	S
CO5	S	S	S	M	M	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
SUGANYA A	Dr. K.LOGAARASI	Member Secretary

B.Sc. – Mathematics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UMAC06	DIFFERENTIAL EQUATIONS AND ITS APPLICATIONS	DSC THEORY - VI	III	4	4	-	-	4
Objective	Students gain the knowledge about the methods of solving ordinary and partial differential equations.							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**Equations of the first order and of the first degree:** Variable separable - Homogeneous Equations-Non-Homogeneous Equations of first degree in two variables -Linear Equation - Bernoulli's Equation-Exact differential equations. (Chapter2: Sections 1 to 6)	K1	10
II	**Equation of first order but of higher degree:** Equation solvable for dy/dx- Equation solvable for y-Equation solvable for x – Clairaut's form **Linear Equations with constant coefficients**: Particular integrals of algebraic, exponential, trigonometric functions and their products. (Chapter4: Sections 1,2 ,3 and Chapter 5: 1 to 4)	K2	10
III	**Simultaneous linear differential equations**: Introduction-Simultaneous equations of the first order and first degree-Solutions of $\frac{dx}{P}=\frac{dy}{Q}=\frac{dz}{R}$ - Methods solving $\frac{dx}{P}=\frac{dy}{Q}=\frac{dz}{R}$ –Geometrical inpretation of $\frac{dx}{P}=\frac{dy}{Q}=\frac{dz}{R}$ - Simultaneous linear differential equations – Simultaneous equations with variable coefficients. (Chapter6: sections 1 to 7)	K3	10
IV	**Partial differential equation of the first order:** Formation of PDE by Eliminating arbitrary constants and arbitrary functions – complete integral – singular integral-General integral-Lagrange's Linear Equations –Simple Applications. (Chapter 12: 1,2,3, and 4)	K4	9
V	**Partial differential equation of the first order:** Special methods – Standard forms-Charpit's Methods – Simple Applications. (Chapter 12: 5 and 6) **Current Trends-* Alternative forms of ODE coding***	K5	9
	* Self Study.		

Course Outcome	**CO1:** Acquire the solutions of homogeneous equations, non-homogeneous equations of degree one in two variables.	K1	
	CO2: Describe the solutions of equations of first order but not of higher degree.	K2	
	CO3: Demonstrate the solutions of simultaneous linear differential equations.	K3	
	CO4: Construct the PDE by eliminating arbitrary constants and arbitrary functions.	K4	
	CO5: Formulate the standard forms and solution of differential equations using Charpit's method.	K5	

Learning Resources	
Text Books	1.S.Narayanan and T.K. Manicavachagom Pillay , Differential equations and its application, S. Viswanathan Printers Pvt. Ltd, 2011.
Reference Books	1.S.Arumugam, A.Thangapandi Issac, A.Somasundaram, Differential equations and its applications, Yes Dee Publications Pvt.Ltd,2020. 2.M.D.Raisinghania, Ordinary and Partial Differential Equations, S.Chand & Company Ltd,2003. 3. S.G.Deo, V.Lakshmikantham, V.Raghavendra, A Textbook of ordinary differential equations, McGraw Hill Education(India) Private Limited, New Delhi ,Reprint 2013.
Website Link	1. https://www.youtube.com/watch?v=YPNoozonpNE 2. https://www.youtube.com/watch?v=K3-3MCn8TmM 3.https://www.youtube.com/watch?v=rYbWrWbK5BA
Self-Study Material	1.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=1637703

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. - Mathematics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards							
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UMAC06	DIFFERENTIAL EQUATIONS AND ITS APPLICATIONS	DSC THEORY - VI	III	4	4	-	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	M	S	S	S	S
CO2	S	M	S	M	S	M	S	M	S	S
CO3	M	S	M	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	S
CO5	S	S	S	M	S	M	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	**Verified By**	**Approved By**
A.Menaka	Dr.K.LOGAARASI	Member Secretary

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M4UMAC07	INDUSTRIAL STATISTICS	DSC THEORY-VII	IV	4	2	2	-	3
Objective	Students can understand the gap between industry academia interface to apply the Theory learnt to industrial applications.							

Unit	Course Content	Knowledge Levels	Sessions
I	Introduction – Combinatorial Methods- Binomial coefficients. Chapter 1 : Section-1.1,1.2,1.3	K1	9
II	Probability – Introduction – Sample spaces - Events The Probability of event – Some Rules of Probability. Chapter 2 : Section-2.1,2.2,2.3,2.4,2.5	K2	9
III	Conditional Probability – Independent Events - Baye's Theorem (Only problems). Chapter 2 : Section-2.6,2.7,2.8.	K3	10
IV	Probability Distributions and Probability Densities – Introduction - Probability Distributions-Continuous Random variables - Probability Density functions – Multivariate Distributions. Chapter 3 : Section-3.1,3.2,3.3,3.4,3.5	K4	10
V	Marginal Distributions- Conditional Distributions- Mathematical Expectations- Introduction- The Expected value of a Random variable- Moments. Chapter3:Section - 3.6, 3.7 and Chapter 4 : Section - 4.1,4.2,4.3 **Current Trends - *The Role of Statistical Methods in Modern Industry and Services***	K5	10
	* Self Study.		

Course Outcome	**CO1:** Define Combinatorial Methods and few examples.	K1	
	CO2: Illustrate the concept of Sample spaces and The Probability of events.	K2	
	CO3: Determine Independent Events and problems.	K3	
	CO4: Classify Probability Distributions and Continuous Random variables.	K4	
	CO5: Summarize the Conditional Distribution and Mathematical Expectation.	K5	

Learning Resources	
Text Books	1. Fruend John E, Mathematical Statistics, Prentice Hall of India, New Delhi.
Reference Books	1. Papoulis A.Probability,Random Variables and Stochastic process, Tata Mc Graw Hill Education Pvt.Ltd.,New Delhi 2. Baisnab A., Jas M.,Elements of Probability and Statistics, Tata Mc Graw Hill Education Pvt.Ltd., New Delhi,1993.
Website Link	1. https://youtu.be/IPjsBUMM00k 2. https://youtu.be/uzkc-qNVoOk 3. https://youtu.be/UnzbuqgU2LE
Self-Study Material	1. https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=1563648

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M4UMAC07	INDUSTRIAL STATISTICS	DSC THEORY - VII	IV	4	2	2	-	3

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	S	M	S
CO2	S	S	M	S	S	M	S	S	S	S
CO3	M	M	S	S	S	S	S	M	S	S
CO4	S	S	S	S	M	S	S	S	S	S
CO5	S	S	S	M	S	S	S	S	S	M
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Problem solving session, Seminar and Group Discussion
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
Mrs.P.SUBHA	Dr.K.LOGAARASI	Member Secretary

B.Sc – Mathematics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M4UMAC08	ELEMENTS OF MATHEMATICAL ANALYSIS	DSC THEORY - VIII	IV	4	4	-	-	4
Objective	To provide the students with characterize sets and functions and understand the convergence and divergence of sequences, series.							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**Sets and Functions:** Sets and elements - Operations on sets – functions – real valued functions – equivalence – countability – Real numbers – least upper bounds. (Chapter1: Section - 1.1 to 1.7)	K1	10
II	**Sequences of Real Numbers:** Definition of a sequence and subsequence - limit of a sequence – convergent sequences – divergent sequences - bounded sequences - monotone sequences. (Chapter2: Section - 2.1 to 2.6)	K2	10
III	**Sequences of Real Numbers:** Operations on convergent sequences – operations on divergent sequences – limit superior and limit inferior – Cauchy sequences. (Chapter2: Section - 2.7 to 2.10)	K3	10
IV	**Series of Real Numbers**: Convergence and divergence –Series with non – negative terms – Alternating series –conditional convergence and absolute convergence –Tests for absolute convergence. (Chapter3: Section -3.1to 3.4 and 3.6)	K4	9

V	**Limits and Metric Spaces:** Limit of a function on the real line - Metric spaces - Limits in metric spaces. **Continuous Functions on Metric Spaces**: Function continuous at a point on the real line - Function continuous on a metric space. (Chapter4: Section - 4.1 to 4.3 and Chapter 5: 5.1, 5.3) **Current Trends-* Functions with Interval as Domain***	K5	9
	* Self Study.		
Course Outcome	**CO1:** Detail Knowledge about sets and functions, equivalence and countability and the LUB axiom	K1	
	CO2: Describe the concept of Sequence and Subsequence of real numbers	K2	
	CO3: Relate the concept of operations on convergent and divergent sequences.	K3	
	CO4: Classify the convergence and divergence series	K4	
	CO5: Explain about the metric spaces and functions continuous on a Metric space.	K5	

Learning Resources	
Text Books	1. Richard R. Goldberg, Methods of Real Analysis: Oxford and IBH Publishing, 2020.
Reference Books	1. Ethan D. Bloch, The Real Numbers and Real Analysis, Springer, 2011. 2. T. M. Apostol, Calculus (Vol.I), John Wiley and Sons (Asia) P.Ltd., 2002. 3. R. G. Bartle and D. RSherbert, Introduction to Real Analysis, John Wiley and Sons (Asia) P.Ltd., 2000.
Website Link	1. https://youtu.be/ao24uTWnMZM 2. https://youtu.be/XdkoTb8PEG0 3. https://youtu.be/FPK6LO1iiXc
Self-Study Material	1. https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=3440187&ppg=9

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. - Mathemaics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M4UMAC08	ELEMENTS OF MATHEMATICAL ANALYSIS	DSC THEORY - VIII	IV	4	4	-	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	S	S	S	S	S	S	S	S
CO2	S	S	M	S	S	S	S	M	S	S
CO3	S	S	S	S	S	M	S	S	M	S
CO4	M	M	S	S	M	S	M	S	S	S
CO5	S	S	S	M	S	S	S	S	S	M
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	**Verified By**	**Approved By**
R. Malathi	Dr.K.LOGAARASI	Member Secretary

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UMAC09	ABSTRACT ALGEBRA	DSC THEORY – IX	V	5	3	2	-	4
Objective	Students will be able to work comfortably with Concepts of Sets, Groups, Rings and applications of the abstract algebraic structures.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Group Theory:** Definition of a Group – Some Examples of Groups- Some Preliminary Lemmas – Subgroups – A counting principle. Chapter 2: Sections 2.1 – 2.5	K1	12
II	**Group Theory:** Normal subgroups and Quotient groups – Homomorphisms – Automorphisms. Chapter 2: Sections 2.6 – 2.8	K2	12
III	**Group Theory:** Cayley's Theorem – Permutation Groups Chapter 2: Sections 2.9 – 2.10	K3	12
IV	**Ring Theory:** Definition and Examples of Rings – Some special classes of Rings – Homomorphisms – Ideals and Quotient Rings – More Ideals and Quotient Rings. Chapter 3: Sections 3.1 – 3.5	K4	12
V	**Ring Theory:** The Field of Quotients of an Integral Domains – Euclidean Rings – A particular Euclidean Ring. Chapter 3: Sections 3.6 – 3.8. **Current Trends-* Space Groups – Endomorphism Rings ***	K5	12
	* Self Study.		
Course Outcome	**CO1:** Remember the groups, subgroups and cyclic groups	K1	

	CO2: Illustrate about Normal subgroup, Quotient groups, Homomorphisms and Automorphisms and homomorphism and automorphism properties.	K2	
	CO3: Apply the concept of Permutation groups and apply Cayley's theorem to problems	K3	
	CO4: Analyze Rings, Ideals and Quotient Rings and examine their structure.	K4	
	CO5: Deduct the field quotient of an integral domain and to Explain in detail about Euclidean Rings.	K5	

Learning Resources	
Text Books	1. I.N.Herstein, Topics in Algebra, Wiley Eastern Ltd. Second Edition, 2006.
Reference Books	1. John B. Fraleigh, A First Course in Abstract Algebra, 7th Ed., Pearson, 2002 2. M. Artin, Abstract Algebra, 2nd Ed., Pearson, 2011. 3. Joseph A Gallian, Contemporary Abstract Algebra, 9th Ed., Nelson Education Ltd, 2017.
Website Link	1. https://youtu.be/j_f7O-4Rb9U?feature=shared 2. https://youtu.be/g7L_r6zw4-c?feature=shared 3. https://youtu.be/M_VsJiRY7a0?feature=shared
Self-Study Material	1.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=3055656&ppg=1 2.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=3113068&ppg=80

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UMAC09	ABSTRACT ALGEBRA	DSC THEORY – IX	V	5	3	2	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	M	M	S	S	S
CO2	S	S	S	S	M	S	M	S	M	S
CO3	S	S	S	M	S	S	M	S	S	S
CO4	M	S	S	M	S	S	M	S	M	S
CO5	S	S	S	S	M	S	M	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Problem solving session, and Group Discussion
Teaching and Learning Methods	Lecture, Chalk and talk method, Smart Class Presentation
Assessment Methods	CIA I,CIA II, Assignment and ESE

Designed By	Verified By	Approved By
MOTHIDHRSHAA D	Dr.K.LOGAARASI	Member Secretary

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(Autonomous)
Rasipuram - 637408.

B.Sc – Mathematics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UMAC10	REAL ANALYSIS	DSC THEORY – X	V	5	3	2	-	4
Objective	Students are study about the Real Numbers and properties of Real–valued functions, Connectedness, Compactness, Completeness of Metric spaces.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Continuous Functions on Metric Spaces**: Open sets– closed sets– Discontinuous function on R^1. **Connectedness, Completeness and Compactness:** More about open Sets - Connected sets. (Chapter 5: Section-5.4 to 5.6 and Chapter 6: Sections-6.1,6.2)	K1	12
II	**Connectedness, Completeness and Compactness:** Bounded sets and totally bounded sets - Complete metric spaces- compact metric spaces, continuous functions on compact metric space, continuity of inverse functions, uniform continuity. (Chapter 6: Sections-6.3 to 6.8)	K2	12
III	**Calculus:** Sets of measure zero, definition of the Riemann integral, existence of the Riemann integral, properties of Riemann integral. (Chapter7: Sections-7.1 to 7.4)	K3	12
IV	**Calculus:** Derivatives- Rolle's theorem, The Law of mean, Fundamental theorems of calculus. (Chapter7: Sections-7.5 to 7.8)	K4	12
V	Taylor's theorem -Point wise convergence of sequences of functions, uniform convergence of sequences of functions (Chapter 8: Sections-8.5 and Chapter 9: Sections-9.1,9.2). **Current Trends-* Functional Analysis and Operator Theory ***	K5	12
	* Self Study.		

Course Outcome	**CO1:** Describe the Continuous and Discontinuous functions, open and close sets, Connectedness, Completeness and Compactness	K1	
	CO2: Compare the concepts of bounded and totally bounded sets, continuity of inverse functions and Uniform continuity	K2	
	CO3: Implement the sets of measure zero, to Explain about the existence and properties of Riemann integral	K3	
	CO4: Analyze the concept of differentiability and to Explain Rolle's theorem, Law of mean, and Fundamental theorem of calculus	K4	
	CO5: Detect the point wise and uniform convergence of sequence of function and to derive the Taylor's theorem	K5	

Learning Resources	
Text Books	1. Richard R.Goldberg, Methods of Real Analysis (John Wiley & sons, 2nd edition) (Indian edition –Oxford and IBH Publishing Co, New Delhi, 1st January 2020)
Reference Books	1. Walter Rudin, Principles of Mathematical Analysis Tata Mc Graw Hill Education, Third edition (1 July 2017). 2. Tom M A postal, Mathematical Analysis Narosa Publishing House, 2nd edition (1974), Addison-Wesley publishing company, New Delhi.
Website Link	1.https://nptel.ac.in 2.https://www.youtube.com/watch?v=DHPHlxWHe3w 3.https://www.youtube.com/watch?v=Kq_KZpljeXo
Self-Study Material	1.https://nlist.inflibnet.ac.in/search/Record/978-3-0348-0101-0

	L-Lecture	T-Tutorial	P-Practical	C-Credit

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(Autonomous)
Rasipuram - 637408.

B.Sc. - Mathematics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M5UMAC10	REAL ANALYSIS	DSC THEORY- X	V	5	3	2	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	S	M	S	M	S
CO2	S	M	S	S	S	S	S	S	M	S
CO3	S	S	M	S	S	S	S	M	M	S
CO4	S	S	S	M	S	S	S	S	S	M
CO5	S	S	S	S	S	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE.

Designed By	Verified By	Approved By
SUGANYA A	Dr. K.LOGAARASI	Member Secretary

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UMAC11	MATHEMATICAL MODELLING	DSC THEORY - XI	V	4	4	-	-	4
Objective	Students can do the construction and analysis of mathematical models found in real life problems. Modelling through differential and difference equations							

Unit	Course Content	Knowledge Levels	Sessions
I	**Mathematical Modeling: Need, Techniques, Classifications and Simple Illustrations:** Simple situations requiring Mathematical Modeling The Technique of Mathematical modeling, Classification of Mathematical modeling, Some characteristics of mathematical models.(Chapter1: Section-1.1, 1.4).	K1	10
II	**Mathematical Modelling, through a system of Ordinary differential equations of first order:** Mathematical modeling through Differential equations, Linear Growth and Decay Models, Non-Linear growth and decay Models, Compartment models.(Chapter2: Section-2.1 to 2.4)	K2	12
III	**Mathematical Modelling, through a system of Ordinary differential equations of first order:** Mathematical modeling in Population Dynamics ,Mathematical modeling of Epidemics Through System of Ordinary Differential Equations of First Order, Compartment models Through System of Ordinary Differential Equations, Mathematical modeling in Economics Based on System of Ordinary Differential Equations of First Order, Mathematical modeling in Medicine, Arms Race Battles and International trade in terms of Systems of Ordinary Differential Equations .(Chapter3: Section-3.1 to 3.6)	K3	12
IV	**Mathematical Modelling, through a system of Ordinary differential equations of Second order:** Mathematical modeling of Planetary Motions Mathematical modeling of Circular Motion and Motion of Satellites, Mathematical modeling Through Linear differential equations of Second order,	K4	7

	Miscellaneous Mathematical models Through Ordinary differential equations of the Second order,(Chapter5: Section-4.1 to 4.4)		
V	**Mathematical Modelling through difference equations:** The Need for Mathematical modeling Through difference equations some simple models ,Basic theory of Linear Difference equations with constant coefficients, Mathematical modeling Through difference equations in Economics and Finance,Mathematical modeling Through difference equations in populations Dynamics and Genetics, Miscellaneous Examples of Mathematical modeling Through difference equations (Chapter 5: Section-5.1to 5.6) **Current Trends-* Mathematical Applications and Modelling***	K5	7
	* Self Study.		
Course Outcome	**CO1:** Relate the simple situations requiring mathematical modelling and determine the characteristics of such models.	K1	
	CO2: Predict non-linear growth and decay models.	K2	
	CO3: Illustrate prey-predator models, competition models, models with removal, and models with immigration.	K3	
	CO4: Compare the Harrod Model.	K4	
	CO5: Justify in detail about difference equations.	K5	

Learning Resources	
Text Books	1 .J N Kapur, Mathematical Modeling, New Age International(P) limited, Publishers 2023.
Reference Books	1. Bimalk. Mishra and DipakK.Satpathi, Mathematical Modeling by Ane Books Pvt. Ltd 1 January 2009. 2.Sandip Banerjee, Mathematical Modeling Models, Analysis and Applications, by CRC Press, Taylor & Francis group, 2014 3.JonasHall& Thomas Ligefjard, Mathematical Modeling applications with Geogebra by John Wiley & Sons, 2017 4. Mark M. Meerschaert: Mathematical Modeling, Elsevier Publ., 2007.
Website Link	1.https://youtu.be/xHtsuOB-TPw 2.https://youtu.be/N7n64rsgi1w 3.https://youtu.be/hGJUFUfu9mA
Self-Study Material	1. https://ebookcentral.proquest.com/lib/inflibnet-ebooks/detail.action?docID=731364

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UMAC11	MATHEMATICAL MODELLING	DSC THEORY - XI	V	4	4	-	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	S	S	M	M	S	M	M
CO2	M	S	S	S	S	M	M	S	M	M
CO3	M	S	S	S	S	M	M	S	M	M
CO4	S	M	M	M	S	S	M	S	M	S
CO5	M	S	S	S	M	M	M	S	M	M
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Lecture, Smart class presentation
Teaching and Learning Methods	Chalk and Board class, Assignment, PPT Presentation
Assessment Methods	CIA-I, CIA-II , Assignment and ESE

Designed By	Verified By	Approved By
R.PARVATHA	Dr.K.LOGAARASI	Member Secretary

B.Sc - Mathematics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UMAC12	OPTIMIZATION TECHNIQUES	DSC THEORY-XII	V	4	4	-	-	4
Objective	To provide knowledge for students on Formulating real life problems into L.P.P							

Unit	Course Content	Knowledge Levels	Sessions
I	**Operations Research – An Overview:** Introduction to Operations Research – Modeling in O.R - Advantages and limitations of models – Linear Programming Problem (LPP) – Mathematical formulation – Illustrations on Mathematical formulation of LPP's - Graphical solution – Some exceptional cases - Introduction (Simplex method) Computational Procedure - Big-M method only. Chapter1 : Sections 1.1 ,1.5 and 1.6; Chapter2: Sections 2.1 to 2.4; Chapter3 : Sections 3.1 to 3.5	K1	10
II	**Transportation Problem** : Model Formulation of an AP - North West Corner rule - Matrix Minima method – Vogel's Approximation Method – Degeneracy in TP- MODI method – Some exceptional Cases (Unbalanced TP & Maximization case in TP). **Assignment Problem**: Introduction - Mathematical formulation - Hungarian method – Special cases in AP (Unbalanced AP & Maximization case in AP) Chapter7: Sections 7.9, 7.10 Chapter8: Sections 8.1 to 8.4	K2	10
III	**Sequencing problem** : Introduction – Problem of sequencing- Basic in sequencing - n jobs to be operated on two machines – Problems – n jobs to be operated on three machines – Problems – n jobs to be operated on m machines – Problems - Two jobs to be operated on m machines (Graphical method) – Problems. Chapter12: Sections 12.1 to 12.6	K3	10

IV	**Games and Strategies** : Introduction - Two person zero sum game - - Some basic terms - The maximum and minimum principle games - Games without saddle points - Mixed strategies - Graphical method 2xn and mx2 games – Dominance Property. (Chapter17:Sections 17.1 to 17.7)	K4	9
V	**Network and scheduling by PERT/CPM**: Introduction – Network basic concepts-Logical Sequencing- Rules of network construction— Concurrent Activities – Critical Path Analysis – Probability consideration in PERT - Differences between CPM and PERT. (Chapter25: Sections 25.1 to 25.8) **Current Trends-*Solution Strategies***	K5	9
	*Self study.		
Course Outcome	**CO1:** Relate the linear programming concept and solve the problems using graphical method, Simplex method and Big-M method.	K1	
	CO2: Illustrate the game, strategies on dominance property.	K2	
	CO3: Identify the transportation problems and Assignment problems.	K3	
	CO4: Inference the solutions for sequencing problems.	K4	
	CO5: Evaluate the network and do PERT calculations.	K5	

Learning Resources	
Text Books	1.Kantiswarup.,Gupta, P.K. and Man Mohan, Operations Research,[Seventeenth Edition],Sultan Chand and Sons, New Delhi,2020.
Reference Books	1. Gupta, P.K. and Hira, D.S. Operations Research, [Eighth Edition], Sulthan .Chand and Co., NewDelhi,2020. 2. Gupta, P.K. and Man Mohan, Problems in Operations Research, [Ninth Edition], Sultan Chand and Sons, New Delhi, 2014. 3. Kalavathy.S. Operations Research[Fourth Edition], Vikas Publishing House,Chennai.2012.
Website Link	1.https://www.youtube.com/watch?v=5xCUzCTjAXQ 2.https://www.youtube.com/watch?v=jonespBF9yk 3.https://www.youtube.com/watch?v=WrAf6zdteXI
Self-Study Material	1. https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=4657102&query=SEQUENCING+PROBLEM

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc - Mathematics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UMAC12	OPTIMIZATION TECHNIQUES	DSC THEORY-XII	V	4	4	-	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	M	S	S	M	M	S	S	S
CO2	S	M	S	S	M	S	S	S	M	S
CO3	M	S	M	M	S	S	M	S	M	S
CO4	M	S	S	M	S	S	S	S	M	S
CO5	S	S	S	S	M	S	M	S	S	M
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE.

Designed By	Verified By	Approved By
MOHANAPRIYA B	Dr.K.LOGAARASI	Member Secretary

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UMAC13	LINEAR ALGEBRA	DSC THEORY - XIII	VI	5	3	2	-	4
Objective	Students will learn about linear combinations and linear span, linear dependency and independence, matrix representation of a linear transformation.							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	Vector spaces – Subspaces – Linear Combinations and linear span - Systems of Linear equations – Homogeneous Equations – Non homogeneous Equations – Elementary Matrices Chapter-1 Section-1.2 to 1.4; Chapter2: 2.7; Chapter3: 3.1	K1	12
II	Linear Dependence and Linear Independence – Bases and Dimensions. Chapter-1 Section-1.5, 1.6	K2	12
III	Linear transformations, null spaces and ranges – Matrix representation of a linear transformation – Invertibility and isomorphisms – dual spaces. Chapter-2 Section-2.1,2.2,2.4, 2.6	K3	12
IV	Eigen values and Eigen vectors - Diagonalizability –Invariant subspaces and the Cayley–Hamilton theorem Chapter-5 Section-5.1,5.2, 5.4	K4	12
V	Inner Products and norms – Gram-Schmidt Orthogonalization Process and Orthogonal complements Chapter-6 Section-6.1,6.2	K5	12

	Current Trends-* Linear Equations – More general groups*		
	* Self Study.		
Course Outcome	**CO1:** Knowledge about the Linear Combinations and linear span , Systems of Linear equations and Homogenous Equations	K1	
	CO2: Realize the Linear Dependence and Linear independence	K2	
	CO3: Appeal the Linear transformations, null spaces and range	K3	
	CO4: Investigate Eigen values and Eigen vectors	K4	
	CO5: Assess the Gram Schmidt Orthogonalization Process	K5	

Learning Resources	
Text Books	1. Stephen H Friedberg, Arnold J Insel and Lawrence E Spence, Linear Algebra,5th edition, 2018,Pearson
Reference Books	1. I.N.Herstein, Topics in Algebra, Wiley Eastern Ltd. Second Edition, 2006. 2. N.S.Gopalakrishnan, University Algebra ,New Age International Publications, Wiley Eastern Ltd. 3. John B.Fraleigh,First course in Algebra ,Addison Wesley.
Website Link	1. https://youtu.be/k7RM-ot2NWY 2. https://youtu.be/7QU7Bi4Sqv8 3. https://youtu.be/V5RnfbZliKg
Self-Study Material	1.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=1789498&ppg=8 2. https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=296149&ppg=9

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M6UMAC13	LINEAR ALGEBRA	DSC THEORY - XIII	VI	5	3	2	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	M	S
CO3	S	M	S	S	M	S	S	S	S	M
CO4	S	M	M	S	S	M	S	S	S	S
CO5	S	S	S	M	S	S	S	M	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Problem solving session and Group Discussion
Teaching and Learning Methods	Chalk and Talk method, Lecture, Smart class presentation.
Assessment Methods	CIA I,CIA II, Assignment and ESE

Designed By	Verified By	Approved By
MOTHIDHRSHAA D	Dr. K.LOGAARASI	Member Secretary

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UMAC14	COMPLEX ANALYSIS	DSC THEORY- XIV	VI	5	3	2	-	4
Objective	To enable the students to identify Analytic functions, to enrich the knowledge on Cauchy Integral formula and Fundamental theorems.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Analytic Functions:** Functions and Mappings - Limits - Theorems on Limits - Limits involving the Point at Infinity – Continuity – Derivatives - Cauchy - Riemann Equations –Examples- Sufficient Conditions for Differentiability - Polar Coordinates - Analytic Functions – Examples - Harmonic Functions. (Chapter 2: Sections 13, 15 to 19, 21 to 27).	K1	12
II	**Integrals:** Contours-Contour Integrals-Some examples-Cauchy - Goursat Theorem-Proof of the Theorem-Simply Connected Domains-Multiply Connected Domains-Cauchy Integral Formula-An Extension of the Cauchy Integral Formula- Liouville's Theorem and the Fundamental Theorem of Algebra. (Chapter 4: Sections 43 to 45, 50 to 55, 58).	K2	12
III	**Series:** Convergence of Sequences-Convergence of Series- Taylor Series-Proof of Taylor's Theorem-Examples-Negative powers of $(z - z_0)$-Laurent Series-Proof of Laurent's Theorem- Examples. (Chapter 5: Sections 60 to 68)	K3	12
IV	**Residues and Poles:** Isolated Singular Points- Residues- Cauchy Residue Theorem-Residue at Infinity- The Three Types of Isolated Singular Points-Examples - Residues at Poles- Examples-Zeros of Analytic Functions-Zeros and poles. (Chapter 6: Sections 74 to 83).	K4	12

V	**Mapping by Elementary Functions:** Linear Transformations - The Transformation w = 1/z - Mappings by 1/z – Linear Fractional Transformations – An Implicit Form. (Chapter 8: Sections 96 to 100) **Current Trend -*Complex networks and their Applications***	K5	12
	* Self Study.		
Course Outcome	**CO1:** Know the concepts of Limits, Continuity and Analytic functions.	K1	
	CO2: Relate the various Linear Transformations and Conformal Mappings	K2	
	CO3: Discuss about the Convergence of Sequences and Series, Taylor's series and Laurent's series.	K3	
	CO4: Find the different Singularities and Residues	K4	
	CO5: Solve the Complex Integrals.	K5	

Learning Resources	
Text Books	1. James Ward Brown and Ruel V. Churchill, Complex Variables and Applications, McGraw Hill, Inc., Ninth Edition, 2009.
Reference Books	1. T.K. Manickavachagam Pillai, Complex Analysis, S. Viswanathan Publishers Pvt.Ltd. 2. P. Duraipandian and Laxmi Duraipandian, Complex Analysis, Emerald Publishers, Chennai, 2001.
Website Link	1. https://youtu.be/t9xW7UaZwZ0 2.https://youtu.be/82N_QZ2vhYg 3.https://youtu.be/K5DeHvUKzK4
Self-Study Material	1.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/detail.action?docID=1725925

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc-Mathematics Syllabus LOCF- CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M6UMAC14	COMPLEX ANALYSIS	DSC THEORY- XIV	VI	5	3	2	-	4

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	M	S	S	M
CO2	S	M	M	S	M	S	S	M	S	S
CO3	S	S	S	S	M	M	S	S	M	S
CO4	S	S	S	M	S	S	S	M	S	M
CO5	S	M	M	S	S	M	S	S	S	M
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE.

Designed By	Verified By	Approved By
SELVI G	Dr.K.LOGAARASI	Member Secretary

B.Sc-Mathematics Syllabus LOCF-CBCS with effect From 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UMAC15	MECHANICS	DSC THEORY- XV	VI	5	3	2	-	4
Objective	Students are able to understand Newton's law of motion, force on rigid bodies and concept of work, energy and power.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Force:** Newton's laws of motion – Resultant of two forces on a particle. **Equilibrium of a Particle:** Equilibrium of a particle –Limiting equilibrium of a particle on an inclined plane. (Chapter2: Section-2.1 & 2.2; Chapter3: Section-3.1 &3.2)	K1	12
II	**Forces on a Rigid Body:** Moment of a Force – General motion of a rigid body – Equivalent (or equipolent) systems of forces- Parallel Forces – Forces along the sides of a triangle. **A specific reduction of Forces:** Reduction of coplanar forces into a force and couple – Problems involving frictional forces. (Chapter 4: Section- 4.1 to 4.5; Chapter 5: Sections-5.1 & 5.2)	K2	12
III	**Work, Energy and Power:** Work – Conservative field of force – Power. **Rectilinear Motion under Varying Force:** Simple Harmonic Motion – S.H.M along a horizontal line – S.H.M along a vertical line. (Chapter11:Section-11.1 to 11.3; Chapter12: Section-12.1 to 12.3)	K3	12
IV	**Projectiles:** Forces on a projectile – Projectile projected on an inclined plane. (Chapter13: Section-13.1 &13.2)	K4	12

V	**Central Orbits:** General orbits – Central orbit – Conic as a centered orbit. (Chapter16: Section-16.1 to 16.3) **Current Trends: * Dimensions, Units and Physical quantities***	K5	12
	*Self Study.		
Course Outcome	**CO1:** Knowledge about the Resultant, Component of a Force, Coplanar forces, like and unlike parallel forces.	K1	
	CO2: Understand the moment of a force and Couple with examples.	K2	
	CO3: Apply the concept of work, energy, power, rectilinear motions under varying forces.	K3	
	CO4: Analyze the Projectile, impulse, impact and laws of impact.	K4	
	CO5: Evaluate the central orbits, explain conics as centered orbits and solve problems related to central orbits.	K5	

Learning Resources				
Text Books	1. P. Duraipandian, Laxmi Duraipandian and Muthamizh Jayapragasm, Mechanics, S.Chand and company, 2015.			
Reference Books	1. A.Ruina and R. Pratap, Introduction to Statics and Dynamics, Oxford University Press, 2014. 2. J.L. Meriam, L.G. Kraige, and J.N. Bolton, Engineering Mechanics: Dynamics, 8th edn, Wiley and sons Pvt ltd., New York, 2015. 3. A.K.Dhiman, P.Dhinam and D.Kulshreshtha, Engineering Mechanics (Statics and Dynamics), McGraw Hill Education (India) Private Limited, New Delhi, 2015.			
Website Link	1. https://youtu.be/37vTDTKbRbM?si=aCKPGKCerPIFENtA 2. https://youtu.be/DMuekGu-u3Y?feature=shared 3. https://youtu.be/4IQC4z8Z-zw			
Self-Study Material	1.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=4657602&query=mechanics			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc-Mathematics Syllabus LOCF-CBCS with effect From 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**	
23M6UMAC15	MECHANICS	DSC THEORY-XV	VI	5	3	2	-	4	

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M	S	S	S	S	M
CO2	M	S	S	S	M	S	M	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	M	M	S	S	S	S	M	S	S
CO5	S	S	S	S	S	M	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Problem solving session and Group Discussion
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
R.MOHAN RAM	Dr.K.LOGAARASI	Member Secretary

Skill Based Elective Course (SEC) for B.Sc., Mathematics SYLLABUS - LOCF-CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onward								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M4UMASP1	LATEX PRACTICAL	SEC PRACTICAL-I	IV	2	-	-	2	2
Objective	To enable the students to Prepare Research Articles in LATEX format.							

Unit	Course Content	Knowledge Levels	Sessions
I	Creation of a Document with different Alignment (Left, Right, Center, Justify).	K1,K2	2
II	Typing a Letter for Applying for a Job.	K2,K3	2
III	Creation of Own Bio-Data.	K2,K3	2
IV	Creating a Table structure.	K3,K4	2
V	Typing a Mathematical Expression involving Differentiation, Integration and Trigonometry.	K5	2
VI	Typing a Mathematical Expression using all Expressions and Inequalities.	K5	2
VII	Creating an Article using LATEX.	K3	2
VIII	Inserting Picture in a LATEX.	K5	2
IX	Preparing a question paper in LATEX Format.	K5	2
X	Creation of PowerPoint Presentation in LATEX.	K5	2
Course Outcome	**CO1:** Knowledge about the different Alignments in a document and an Application for a Job.	K1	
	CO2: Understand the Bio-Data Creation and Table Structure in LATEX.	K2	
	CO3: Apply Mathematical Statements using LATEX.	K3	

	CO4: Analyze to prepare Articles and Inserting Pictures.	K4	
	CO5: Create a question paper and PowerPoint Presentation in a LATEX.	K5	

Learning Resources	
Text Books	1.David F Griffiths and Desmond J. Higham, Learning LaTex**,** SIAM (Society for Industrial and Applied Mathematics) Publishers, Phidelphia, 1996.
Reference Books	1. Nambudiripad, K.B.M., LaTeX for beginners, Narosa Publishing House private limited, New Delhi, 2014. 2. Martin J. Erickson and Donald Bindner, A student's Guide to the Study, Practice and Tools of Modern Mathematics, CRC Press, Boca Raton, FL, 2011. 3. L. Lamport, LATEX: A Document Preparation System, User's Guide and Reference Manual, Addison-Wesley, Newyork, Second edition, 1994.
Website Link	1. https://youtu.be/HcSeMmpx5uk 2.https://youtu.be/ZL2Ni2qopY0 3. https://youtu.be/RyhQk8IoRV0 4. https://youtu.be/QKqyM6Y33-E 5. https://youtu.be/P92fidpi9rA 6. https://youtu.be/QVyQMhzL5yc 7. https://youtu.be/Q0fEg_JggPQ 8. https://youtu.be/84dHitE1nik 9. https://youtu.be/gLD8zkN-ltI 10. https://youtu.be/5XX3okL_csg

	L-Lecture	T-Tutorial	P-Practical	C-Credit

Skill Based Elective Course (SEC) for B.Sc., Mathematics
SYLLABUS - LOCF-CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onward

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M4UMASP1	LATEX PRACTICAL	SEC PRACTICAL-I	IV	2	-	-	2	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M	S	S	S	S	M
CO2	M	S	S	S	M	S	M	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	M	M	S	S	S	S	M	S	S
CO5	S	S	S	S	S	M	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Nil	
Teaching and Learning Methods	Lecture, Smart class presentation.	
Assessment Methods	Model Practical	
Designed By	**Verified By**	**Approved By**
MOTHIDHRSHAA D	Dr. K.LOGAARASI	Member Secretary

List of Foundation Course(FC) Details for B.Sc., Mathematics

SYLLABUS - LOCF-CBCS Pattern

EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

S.No.	Sem	COURSE_CODE	TITLE OF THE COURSE
1	I	23M1UMAFC1	BRIDGE MATHEMATICS

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UMAFC1	BRIDGE MATHEMATICS	FC - I	I	2	2	-	-	2
Objective	To provide knowledge for students of general concepts.							

Unit	Course Content	Knowledge Levels	Sessions
I	Algebra: Binomial theorem, General term, middle term, problems based on these concepts. NCERT-(11th standard) [Chapter-8,Page No:160-176]	K1	4
II	Sequences and series (Progressions). Fundamental principle of counting. Factorial n. NCERT-(11th standard) [Chapter-9,Page No:177-196]	K2	5
III	Permutations and combinations, Derivation of formulae and their connections, simple applications, combinations with repetitions, arrangements within groups, formation of groups. Volume I (11^{th} standard) [Chapter-4, Sec 4.4-4.5 Page No:167-186]	K3	5
IV	Trigonometry: Introduction to trigonometric ratios, proof of sin(A+B), cos(A+B), tan(A+B) formulae, multiple and sub multiple angles, sin(2A), cos(2A), tan(2A) etc., transformations sum into product and product into sum formulae, Properties of Triangle, The law of sines and law of cosines. Volume I (11^{th} standard) [Chapter-3, Sec 3.5,3.5.2,3.5.3 Page No: 104-122] [Chapter-3, Sec 3.7.1-3.7.2 Page No: 134-137]	K4	5
V	Calculus: Differentiation Rules, Problems of uv rule, Problems of u/v rule, Derivatives of basic elementary functions, Examples on Chain Rule. Volume II (11^{th} standard) [Chapter-10, Sec 10.4.1,10.4.2 Page No:148-164]	K5	5

	*Self study.		
Course Outcome	**CO1:** Knowledge about the binomial theorem and apply it to find the expansions of any (x + y) n and also, solve the related problems.	K1	
	CO2: Understanding the various sequences and series and solve the problems related to them. Explain the principle of counting.	K2	
	CO3: Applying the concept of number of permutations and combinations in different cases. Apply the principle of counting to solve the problems on permutations and combinations.	K3	
	CO4: Analyze the various trigonometric ratios and find them for different angles, including sum of the angles, multiple and sub multiple angles, etc. Also, they can solve the problems using the transformations.	K4	
	CO5: Evaluate the limit and derivative of a function at a point, the definite and indefinite integral of a function. Find the points of min/max of a function.	K5	

Learning Resources	
Text Books	1. NCERT class XI text books, First edition February 2006, reprint 2019, UNIT I & II. 2. State Board Mathematics text books of class XI, Volume – 1, Revised edition 2019, 2020, UNIT III. 3. State Board Mathematics text books of class XI, volume -1, Revised edition 2019, 2020. UNIT IV. 4. State Board Mathematics text books of class XI, volume -2, revised edition 2019, UNIT V.
Reference Books	-
Website Link	1. https://youtu.be/SwaVN0epc0w?si=F3HloFN8kHmWxiJw 2. https://youtu.be/3zNcVPxRAGA?si=WORGOu4eKh5ARax5 3. https://youtu.be/XJnIdRXUi7A?si=ELNWnIWdNJcaSYQm
Self-Study Material	-

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Rasipuram - 637408

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M1UMAFC1	BRIDGE MATHEMATICS	FC - I	I	2	2	-	-	2	

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M	S	S	S	S	M
CO2	M	S	S	S	M	S	M	S	S	S
CO3	S	S	S	S	S	S	M	S	S	S
CO4	S	M	M	S	S	M	S	M	S	S
CO5	S	S	S	S	S	M	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-	
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.	
Assessment Methods	CIA-I, CIA-II, Assignment and ESE.	
Designed By	**Verified By**	**Approved By**
MOHANAPRIYA B	Dr.K.LOGAARASI	Member Secretary

List of Elective Course(DSE) Details for B.Sc., Mathematics
SYLLABUS - LOCF-CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

S.No.	Sem	COURSE_CODE	TITLE OF THE COURSE
1	V	23M5UMAE01	NUMERICAL METHODS WITH APPLICATIONS
2	V	23M5UMAE02	DISCRETE MATHEMATICS
3	V	23M5UMAE03	MATHEMATICAL STATISTICS
4	VI	23M6UMAE04	NUMBER THEORY
5	VI	23M6UMAE05	GRAPH THEORY WITH APPLICATIONS
6	VI	23M6UMAE06	DIFFERENCE EQUATIONS WITH APPLICATIONS

B.Sc. – Mathematics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UMAE01	NUMERICAL METHODS WITH APPLICATIONS	DSE THEORY – I	V	5	3	2	-	3
Objective	Students can learn about how to use computational techniques to solve complex mathematical problems accurately and efficiently.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Solution of Algebraic and Transcendental Equations**: The Bisection Method– The method of false position - The Iteration method- Newton Raphson Method -Generalized Newton's Method - Ramanujan's Method - Muller's method. Chapter 2: Sections 2.1 to 2.6, 2.8	K1	12
II	**Interpolation**: Finite Difference - Forward Differences –Backward Differences - Central Differences - symbolic relations and separation of symbols - Newton's formulae for interpolation - Central Difference interpolation formulae - Gauss Central difference formulae - Stirling's Formula (Problems only). Chapter 3: Sections 3.3(3.3.1 - 3.3.4), 3.6, 3.7(3.7.1&3.7.2)	K2	12
III	**Interpolation**: Lagrange's Interpolation Formulae - Divided differences -Newton's general interpolation formula Interpolation by iteration- Inverse Interpolation. (Problems only) Chapter 3: Sections 3.9.1,3.10, 3.11	K3	12
IV	**Numerical Differentiation and Integration:** Numerical Differentiation - Maximum and minimum values of Tabulated function - Numerical Integration -Trapezoidal Rule –Simpson's 1/3 Rule – Simpson's 3/8 Rule - Boole's and Weddle's rule. (Problems only) Chapter 6: Sections 6.2, 6.3, 6.4(6.4.1 - 6.4.4)	K4	12

V	**Numerical Linear Algebra:** Solution of Linear Systems - Direct method - Gauss elimination Method – Gauss Jordan Method - Modification of Gauss Method to compute the inverse - LU Decomposition Method-Computational procedure for LU decomposition method -Solution of Linear system- Iterative Methods – (Problems only) Chapter 7: Sections 7.5(7.5.1, 7.5.3, 7.5.4, 7.5.6, 7.5.7 & 7.6) **Current Trends-* Analysis of elimination method ***	K5	12
	* Self Study.		
Course Outcome	**CO1:** Acquire the knowledge about Iteration.	K1	
	CO2: Understand the concept of Interpolation and Operators.	K2	
	CO3: Determination of Gauss method to solve a system of equations represented as an augmented matrix.	K3	
	CO4: Analyze the knowledge and skills of ODE.	K4	
	CO5: Deduct the Numerical Differential and Integration.	K5	

Learning Resources	
Text Books	1. S.S. Sastry, Introductory Methods of Numerical Analysis, 5th Edition, Prentice-Hall of India Private Ltd, New Delhi,2012
Reference Books	1. P. Kandasamy, K. Thilagavathy, K. Gunavathy -Numerical Methods, Third Revised Edition, S.Chand & Company Ltd., Ram Nagar, New Delhi, Reprint 2005. 2. T.K.Manickavasagam and Narayanan S.Viswanathan and Co, Engineering Numerical Methods, Chennai, 1998. 3. Balagurusamy, Numerical Methods, Tata Me Graw Hill Publishing Company Ltd, New Delhi, 2002.
Website Link	1.https://youtu.be/3j0c_FhOt5U 2.https://youtu.be/EA76ONWBgK4 3.https://www.youtube.com/watch?v=dOqMFkFaf7I
Self-Study Material	1. https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=313790

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc. - Mathematics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UMAE01	NUMERICAL METHODS WITH APPLICATIONS	DSE THEORY – I	V	5	3	2	-	3

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	M	S	S	S	M
CO2	S	S	S	M	S	S	S	M	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	M	S	S	S	S	M	S	S
CO5	S	S	S	S	S	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Problem solving session and Group Discussion
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	**Verified By**	**Approved By**
A.Menaka	Dr.K.LOGAARASI	Member Secretary

B.Sc-Mathematics Syllabus LOCF-CBCS with effect From 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hour**	**L**	**T**	**P**	**C**
23M5UMAE02	DISCRETE MATHEMATICS	DSE THEORY- II	V	5	3	2	-	3
Objective	Students are able to study the basic concepts of mathematical logic, Truth Table, Relations and Ordering, Lattices as partially ordered sets in discrete mathematics.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Mathematical logic** : Statements and Notations - Connectives - Negation - Conjunction - Disjunction - Statement formulas and truth table - Conditional and Bi-conditional - Well formed formulas - Tautologies. Chapter 1 (sections 1.1, 1.2.1 to 1.2.4, 1.2.6 to 1.2.8)	K1	12
II	**Normal forms**: Disjunctive Normal forms - Conjunctive Normal forms - Principal Disjunctive Normal forms - Principal conjunctive Normal forms - Ordering and Uniqueness of normal forms - Validity using truth tables - Rules of inference. Chapter 1 (sections 1.3.1 to 1.3.5, 1.4.1, 1.4.2)	K2	12
III	**The Predicate calculus**: Predicates - The Statement function, Variables and quantifiers - Predicate formulas - Free and bound variables - The Universe of discourse - inference theory of the predicate calculus - Valid formulas and Equivalence - Some valid formulas over finite Universes - Special valid formulas involving quantifiers - Theory of inference for the Predicate calculus. Chapter 1 (sections 1.5.1 to 1.5.5, 1.6.1 to 1.6.4)	K3	12
V	**Lattices as partially ordered sets:** Definition and examples - Some properties of Lattices - Sub lattices, Direct product and Homomorphism - Boolean algebra: Definition and examples - Sub Algebra, Direct product and Homomorphism. Chapter 4 (sections 4.1.1, 4.1.2, 4.1.4, 4.2.1, 4.2.2) **Current Trends:*Axioms of Boolean algebra***	K5	12

	*Self Study.		
Course Outcome	**CO1:** Remember the concept of mathematical logic statement and notations	K1	
	CO2: Understand the normal forms and rules of inference	K2	
	CO3: Apply the predicate logic to find the theory of inference for the Predicate calculus.	K3	
	CO4: Analyze the Relations and Ordering, Define types of functions and natural numbers	K4	
	CO5: Evaluate the concept Lattice and properties of Lattice to solve Boolean Algebra	K5	

Learning Resources	
Text Books	1. J.P. Tremblay, R. Manohar, Discrete Mathematics structure with Applications to computer sciences, Tata Mc Graw hill, 2001.
Reference Books	1. Dr. M.K. Sen and Dr. B.C. Charraborthy, Introduction to Discrete Mathematics, Arunabha Sen Books & allied Pvt. Ltd, 8/1, Chintamoni Das Lane, Kolkata - 700 009 2. Kenneth H. Rosen, Discrete Mathematics and Its Applications, Seventh Edition, 2007.
Website Link	1.https://youtu.be/A3Ffwsnad0k?feature=shared 2.https://www.youtube.com/watch?v=06BRdIxmDOM 3.https://www.youtube.com/watch?v=qC2reWAo2mc
Self-Study Material	1.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=4657206&query=discrete+mathematics

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc-Mathematics Syllabus LOCF-CBCS with effect From 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**	
23M5UMAE02	DISCRETE MATHEMATICS	DSE THEORY- II	V	5	3	2	-	3	

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	M	S	S	S	S
CO2	S	S	S	M	S	M	S	S	S	S
CO3	S	S	S	M	S	M	S	S	S	S
CO4	S	S	S	M	S	M	S	S	S	S
CO5	S	S	S	M	S	M	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Problem solving session and Group Discussion
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	**Verified By**	**Approved By**
R.MOHAN RAM	Dr.K.LOGAARASI	Member Secretary

B.Sc-Mathematics Syllabus LOCF-CBCS with effect From 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UMAE03	MATHEMATICAL STATISTICS	DSE THEORY- III	V	5	3	2	-	3
Objective	Students are able to gain the knowledge about Random Variables and Distribution of Random Variables, Mathematical Expectation and Variance in mathematical statistics.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Random variables and Distribution functions:** Introduction– Distribution functions - Discrete random variable (One dimensional)- Probability mass function and Distribution function – Continuous Random variable (one dimensional) –Probability density function – Various Measures of Central tendency-Continuous distribution function-Problems. (Chapter5: Sections 5.1 to 5.4)	K1	12
II	**Mathematical Expectation:** Introduction –Mathematical Expectation –Expected value of function of Random variable- Properties - Variance – Properties – Covariance. (Chapter6: Sections 6.1 to 6.6)	K2	12
III	**Generating functions and Law of large numbers:** Moment Generating functions – Cumulants -Characteristic function – Properties – Problems. (Chapter7: Sections 7.1 to 7.4)	K3	12
IV	**Special Discrete Probability Distributions:** Introduction - Binomial, Poisson, Geometric distributions– Theorems (Statements only) - Properties and Problems. (Chapter8: Sections 8.1, 8.4, 8.5, 8.7)	K4	12

V	**Some Continuous Probability Distributions:** Normal distribution, Uniform distribution and Exponential distribution - Theorems (Statements only) -Properties and Problems. (Chapter9: Sections 9.1 to 9.3, 9.8) **Current Trends:*Some properties of Binomial distribution***	K5	12
	* Self Study.		
Course Outcome	**CO1:** Knowledge about Random variables, Probability mass function, Probability density function, and Distribution functions	K1	
	CO2: Understand the concept of Expectation, Variance and Covariance.	K2	
	CO3: Determination of Moment Generating functions and Characteristic functions.	K3	
	CO4: Analyze the concept of theoretical Discrete	K4	
	CO5: Evaluate the Normal distribution, Uniform distribution and Exponential distribution.	K5	

Learning Resources	
Text Books	1. Gupta S.C. and Kapoor V.K, Fundamentals of Mathematical Statistics, Sultan Chand and Sons, New Delhi, [Twelfth Edition], 2020.
Reference Books	1. Gupta S.C. and Kapoor V.K, Elements of Mathematical Statistics,Sultan Chand and Sons, New Delhi, [Third Edition],2001 2. Vittal P.R, Mathematical Statistics,Margham Publications, Chennai.202
Website Link	1. https://youtu.be/l0ecMiNUZu8?si=gU1vTF7VXniy3cJx 2. https://youtu.be/hz_o2ej5ZZA 3. https://youtu.be/cbmfYoepHPk?feature=shared
Self-Study Material	1.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=4657529&query=Special+Discrete+Probability+Distributions

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Rasipuram - 637408.

B.Sc-Mathematics Syllabus LOCF-CBCS with effect From2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M5UMAE03	MATHEMATICAL STATISTICS	DSE THEORY- III	V	5	3	2	-	3

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	M	S	S	S	M
CO2	M	S	S	M	S	S	S	M	S	S
CO3	S	S	S	S	S	S	M	S	S	S
CO4	M	S	M	S	M	M	S	M	S	S
CO5	S	S	S	S	S	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Problem solving session and Group Discussion
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
R.MOHAN RAM	Dr.K.LOGAARASI	Member Secretary

B.Sc – Mathematics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M6UMAE04	NUMBER THEORY	DSE THEORY - IV	VI	5	3	2	-	3
Objective	Students are able to understand the concept of divisibility, primes, congruence and arithmetic functions in number theory.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Divisibility Theory in the Integers:** Early Number Theory - The Division Algorithm - The Greatest Common Divisor - The Euclidean Algorithm - The Diophantine Equation ax+by = c (Chapter2: Sections 2.1 to 2.5)	K1	12
II	**Primes and Their Distribution:** The Fundamental Theorem of Arithmetic - The Sieve of Eratosthenes - The Goldbach Conjecture (Chapter 3:Sections-3.1 to 3.3)	K2	12
III	**The Theory of Congruences:** Carl Friedrich Gauss - Basic Properties of Congruence - Binary and Decimal Representations of Integers - Linear Congruences and the Chinese Remainder Theorem (Chapter4: Sections 4.1 to 4.4)	K3	12
IV	**Fermat's Theorem:** Pierre de Fermat - Fermat's Little Theorem and Pseudoprimes - Wilson's Theorem - The Fermat - Kraitchik Factorization Method (Chapter 5: Sections 5.1 to 5.4)	K4	12

V	**Euler's Generalization of Fermat's Theorem:** Leonhard Euler - Euler's Phi - Function - Euler's Theorem - Some properties of the Phi - Function. (Chapter 7: Sections 7.1 to 7.4) **Current Trends-*Polynomial Congruences and Primitive Roots ***	K5	12
	*Self Study.		
Course Outcome	**CO1:** Define the concept of the Division Algorithm, Greatest Common Divisor and the Euclidean Algorithm	K1	
	CO2: Describe the Fundamental Theorem of arithmetic.	K2	
	CO3: Identify the Chinese Remainder Theorem.	K3	
	CO4: Analyze the Fermat's Little Theorem and Pseudo primes**.**	K4	
	CO5: Justify Euler's Phi - Function and Euler's Theorem.	K5	

Learning Resources				
Text Books	1. David M. Burton, Elementary Number theory 7th Ed., McGraw – Hill Edition, 2012.			
Reference Books	1. Neville Robinns, Beginning Number Theory, 2nd Ed., Narosa Publishing House Pvt. Limited, Delhi 2006. 2. Richard E. Klima, Neil Sigmon, Ernest Stitzinger, Applications of Abstract Algebra with Maple, CRC Press, Boca Raton, 2000.			
Website Link	1. https://youtu.be/qBrYneqX_vE 2. https://youtu.be/7VPA-HjjUmU 3. https://youtu.be/vi201sf_bsY			
Self-Study Material	1. https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=3330423&ppg=9			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc – Mathematics Syllabus LOCF - CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M6UMAE04	NUMBER THEORY	DSE THEORY - IV	IV	5	3	2	-	3

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	S	M	S
CO2	S	S	M	S	S	M	S	S	S	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	M	S	S	M	S	S	M	S	S
CO5	M	S	S	M	S	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW			M-MEDIUM			S-STRONG			

Tutorial Schedule	Problem solving session, Seminar and Group Discussion
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation
Assessment Methods	CIA-I, CIA-II, Assignment and ESE.

Designed By	Verified By	Approved By
R. Malathi	Dr.K.LOGAARASI	Member Secretary

B.Sc-Mathematics Syllabus LOCF-CBCS with effect From2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UMAE05	GRAPH THEORY WITH APPLICATIONS	DSE THEORY - V	VI	5	3	2	-	3
Objective	Students are able to acquire knowledge on the concepts of Graphs, Matrices of Graphs and Digraphs.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Introduction:** What is a Graph? – Application of Graphs – Finite and Infinite Graphs – Incidence and Degree – Isolated vertex, Pendant vertex, and Null graph. **Paths and Circuits:** Isomorphism – Subgraphs – Walks, Paths, and Circuits – Connected Graphs, Disconnected Graphs,and Components Chapter 1: Sections 1.1 – 1.5 Chapter 2: Sections 2.1, 2.2, 2.4 and 2.5	K1	12
II	**Paths and Circuits:** Euler Graphs – Operations on Graphs – More on Euler Graphs – Hamiltonian Paths and Circuits. **Trees and Fundamental Circuits:** Trees – Some Properties of Trees – Pendant vertices in a Tree – Distance and Centers in a Tree – Spanning Trees Chapter 2: Sections 2.6 – 2.9 Chapter 3: Sections 3.1 – 3.4 and 3.7	K2	12
III	**Matrix Representation of Graphs:** Incidence Matrix – Submatrices of A(G) – Circuit Matrix – Fundamental Circuit Matrix and Rank of B – An application to switching network – Cut-set matrix – Relationship among A_f, B_f and C_f – Path matrix – Adjacency Matrix Chapter 7: Sections 7.1 – 7.9	K3	12
IV	**Coloring, Covering and Partitioning:** Chromatic Number – Chromatic Partitioning – Chromatic Polynomial – Matchings – Coverings Chapter 8: Sections 8.1 – 8.5	K4	12

V	**Directed Graphs:** What is a Directed Graph? – Directed Paths and Connectedness – Euler Digraphs – Trees with Directed Edges. Chapter 9: Sections 9.1 and 9.4 – 9.6 **Current Trends: *Fundamental ideas of graph theory***	K5	12
	*Self Study.		
Course Outcome	**CO1:** Recall the concepts of Graph, Sub graph , Walks and Paths	K1	
	CO2: Demonstrate the Eulerian graphs, Hamiltonian Paths and Trees	K2	
	CO3: Apply the Matrix Representations of Graphs.	K3	
	CO4: Analyze the Chromatic number and Chromatic Polynomial.	K4	
	CO5: Evaluate digraph and Euler digraphs.	K5	

Learning Resources	
Text Books	1. Narsingh Deo, Graph Theory with Applications to Engineering & Computer Science , Prentice Hall of India Private limited, New Delhi-110001.2012.
Reference Books	1. Frank Harary, Graph Theory, Narosa Publishing House Pvt. Ltd., New Delhi. 2001 2. Arumugam, S. and Ramachandran, S, Invitation to Graph Theory, Scitech Publications, Chennai.2001. 3. S.P.Rajagopalan and R.Sattanathan, Graph Theory, Margham Publications, Chennai.
Website Link	1. https://youtu.be/h9w-fgHGLMs?feature=shared 2 https://youtu.be/tVuEZakQxhQ?feature=shared 3. https://youtu.be/17erhldpZ8E?feature=shared 4. https://youtu.be/rJzgGPuZ14c?feature=shared
Self-Study Material	1.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=4657206&query=Graph+Theory

	L-Lecture	T-Tutorial	P-Practical	C-Credit

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
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B.Sc-Mathematics Syllabus LOCF-CBCS with effect From2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**	
23M6UMAE05	GRAPH THEORY WITH APPLICATIONS	DSE THEORY- V	IV	5	3	2	-	3	

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	M	M	S	S	S
CO2	S	S	S	S	M	S	M	S	M	S
CO3	S	S	S	M	S	S	M	S	S	S
CO4	M	S	S	M	S	S	M	S	M	S
CO5	S	S	S	S	M	S	M	S	S	S
Level of Correlation between CO and PO	L-LOW			M-MEDIUM			S-STRONG			

Tutorial Schedule	Problem solving session and Group Discussion
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
R.MOHAN RAM	Dr.K.LOGAARASI	Member Secretary

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M6UMAE06	DIFFERENCE EQUATIONS WITH APPLICATIONS	DSE THEORY - VI	VI	5	3	2	-	3
Objective	Students can study the difference operator and its applications. Solving first order difference equations and Difference equations using matrix form.							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	Difference operator - Summation – Generating functions and approximate summation. (Chapter 2: Sections 2.1 to 2.3)	K1	12
II	First order equations - General results for linear equations - Solving linear equations. (Chapter 3: Sections 3.1 to 3.3)	K2	12
III	Equations with variable coefficients – The z -transform. (Chapter 3: Sections 3.5 to 3.7)	K3	12
IV	Initial value problems for linear systems – Stability of linear systems. (Chapter 4: Sections 4.1, 4.2)	K4	12
V	Phase plane Analysis for Linear Systems, Fundamental Matrices and Floquet Theory. (Chapter 4: Sections 4.3, 4.4) **Current Trends-*Homogeneous Equation***	K5	12
	*Self study.		
Course Outcome	**CO1**: Recall the difference operator.	K1	
	CO2: Illustrate the first order difference equation and linear equations.	K2	
	CO3: Build to Solve equation with variable coefficients.	K3	
	CO4: Inference the initial value problem for linear systems.	K4	
	CO5: Deduct the fundamental matrices.	K5	

Learning Resources	
Text Books	1. W.G. Kelleyand A.C. Peterson, "Difference Equations", 2nd Edition, Academic Press, New York, 2001.
Reference Books	1. R.P. Agarwal, "Difference Equations and Inequalities", 2nd Edition, Marcel Dekker, New York, 2000. 2. S.N. Elaydi, "An Introduction to Difference Equations", 3rd Edition, Springer, India, 2008. 3. R. E. Mickens, "Difference Equations", 3rd Edition, CRC Press, 2015.
Website Link	1. https://youtu.be/gd1FYn86P0c?si=qvgrxQShHs-N9FcR 2. https://youtu.be/MZVXN8w3tpc?si=ttr_CdgRwYSgDfZn 3. https://youtu.be/mmJxKE-TpEk?si=AXV0MifgLywZBSQU
Self-Study Material	1. https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=4656223&query=DIFFERENCE+EQUATIONS

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M6UMAE06	DIFFERENCE EQUATIONS WITH APPLICATIONS	DSE THEORY – VI	VI	5	3	2	-	3

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	S	S	S	S	S	M	S	M	S
CO2	S	M	S	S	M	S	M	S	M	S
CO3	S	S	M	S	S	S	S	M	M	S
CO4	S	S	S	M	S	S	M	S	S	M
CO5	S	S	S	S	S	S	M	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecturer, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I,CIA-II, Assignment and ESE.

Designed By	Verified By	Approved By
MOHANAPRIYA B	Dr.K.LOGAARASI	Member Secretary

List of Non Major Elective Course (NMEC) offered by the B.Sc.,Mathematics

SYLLABUS - LOCF-CBCS Pattern

EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

S.No.	SEM	COURSE_CODE	TITLE OF THE COURSE
1	III	23M3UMAN01	QUANTITATIVE APTITUDE - I
2	IV	23M4UMAN02	QUANTITATIVE APTITUDE - II

NMEC Subjects for Degree B.Sc., Computer Science, Information Technology offered by the Department of UG- Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M3UMAN01	QUANTITATIVE APTITUDE - I	NMEC	III	2	2	-	-	2

Objective	The students develop strong mathematical skills that are crucial for various academic and professional pursuits, including competitive exams, higher education, and careers.		
Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**Arithmetical Ability:** Numbers - H.C.F. & L.C.M. of Numbers. Chapter: 1 and 2	K1	5
II	**Arithmetical Ability:** Decimal Fractions - Square Roots & Cube Roots. Chapter: 3 and 5	K2	5
III	**Arithmetical Ability:** Average - Problems on Ages. Chapter: 6 and 8	K3	5
IV	**Arithmetical Ability:** Surds & Indices - Percentages. Chapter: 9 and 10	K4	5
V	**Arithmetical Ability:** Ratio & Proportion - Chain Rule. Chapter: 12 and 14	K5	4
	* Self Study.		
Course Outcome	**CO1:** Recall the basic concepts of Numbers, H.C.F. & L.C.M , Average.	K1	
	CO2: Understand the basic concepts of Surds and indices, Chain Rule.	K2	
	CO3: Apply the acquired knowledge on Problems on Ratio & Proportion, Ages.	K3	

	CO4: Analyze the problems on Decimal Fractions and Square Roots.	K4	
	CO5: Evaluate the Problems on Cube Roots.	K5	

Learning Resources	
Text Books	1. Dr. R.S. Aggarwal, Quantitative Aptitude, S. Chand and Company Ltd., New Delhi, Reprint 2012.
Reference Books	1. Abhijit Guha, Quantitative Aptitude ,Tata McGraw Hill Publishing Company Limited, New Delhi, Reprint 2005.
Website Link	1.https://youtu.be/h3ijy5zXRGM 2.https://youtu.be/SGj_uTJ83s0 3.https://youtu.be/OD5PLdHTPws
Self-Study Material	1.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=3017422&query=MATHS+REASONING

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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NMEC Subjects for Degree B.Sc., Computer Science, Information Technology offered by the Department of UG- Mathematics
SYLLABUS - CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M3UMAN01	QUANTITATIVE APTITUDE - I	NMEC	III	2	2	-	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	M	S
CO3	S	M	S	S	M	S	S	S	S	M
CO4	S	M	M	S	S	M	S	S	S	S
CO5	S	S	S	M	S	S	S	M	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
SUBHA P	Dr.K.LOGAARASI	Member Secretary

NMEC Subjects for Degree B.Sc., Computer Science, Information Technology offered by the Department of UG- Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M4UMAN02	QUANTITATIVE APTITUDE - II	NMEC	IV	2	2	-	-	2
Objective	The students develop strong mathematical skills that are crucial for various academic and professional pursuits, including competitive exams, higher education, and careers.							
Unit	**Course Content**					**Knowledge Levels**		**Sessions**
I	**Arithmetical Ability:** Time & Work - Time & Distance. Chapter: 15 and 17					K1		5
II	**Arithmetical Ability:** Problems on trains - Boats & Streams. Chapter: 18 and 19					K2		5
III	**Arithmetical Ability:** Logarithms - Permutations & Combinations Chapter: 23 and 30					K3		5
IV	**Arithmetical Ability:** Simple Interest - Compound Interest Chapter: 21 and 22					K4		5
V	**Arithmetical Ability:** Calendar - Clocks. Chapter: 27 and 28					K5		4
	* Self Study.							
Course Outcome	**CO1:** Recall the basic concepts of Time and Work , Logarithms, Calendar.					K1		
	CO2: Understand the basic concepts of trains - Boats & Streams.					K2		
	CO3: Apply the acquired knowledge on Problems on Permutations & Combinations.					K3		
	CO4: Analyze the problems on Simple Interest - Compound Interest					K4		

	CO5: Evaluate the Problems on Clocks and Calendar.		K5	
Learning Resources				
Text Books	1. Dr. R.S. Aggarwal, Quantitative Aptitude, S. Chand and Company Ltd., New Delhi, Reprint 2012.			
Reference Books	1.Abhijit Guha, Quantitative Aptitude Tata McGraw Hill Publishing Company Limited, New Delhi. Reprint 2005.			
Website Link	1.https://youtu.be/w8VmNXgpbC0 2.https://youtu.be/HrPyIdM4D8I 3.https://youtu.be/kQcVMyJrFyE			
Self-Study Material	1.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=3017422&query=MATHS+REASONING			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

NMEC Subjects for Degree B.Sc., Computer Science, Information Technology offered by the Department of UG- Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards										
Course Code	**Course Title**			**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M4UMAN02	QUANTITATIVE APTITUDE - II			NMEC	IV	2	2	-	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	S	M	S
CO2	S	M	S	S	S	S	S	S	S	S
CO3	S	S	S	S	S	M	S	S	M	S
CO4	S	S	S	S	S	S	M	S	S	S
CO5	S	S	S	M	S	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	**Verified By**	**Approved By**
SUGANYA A	Dr.K.LOGAARASI	Member Secretary

List of Skill Enhancement Course (SEC)Details for B.Sc.,
Mathematics SYLLABUS - LOCF-CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

S.No.	Sem	COURSE_CODE	TITLE OF THE COURSE
1	II	23M2UMAS01	COMPUTATIONAL MATHEMATICS
2	III	23M3UMAS02	STATISTICS WITH EXCEL PROGRAMMING
3	III	23M3UMAS03	QUANTITATIVE APTITUDE - I
4	IV	23M4UMAS04	QUANTITATIVE APTITUDE - II
5	IV	23M4UMASP1	LATEX PRACTICAL

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M2UMAS01	COMPUTATIONAL MATHEMATICS	SEC THEORY-I	II	2	2	-	-	2
Objective	Understand and use the structure of C++ programme, to solve different Numerical Methods.							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	Algebraic and Transcendental Equations: Bisection method-Method of false position- Method of successive approximation-Newton-Raphson's method-Secant Method-Graeff's root squaring method.	K1	5
II	System of Linear Algebraic Equations: Direct method-Iterative method-Eigen value problems.	K2	5
III	C++ Program for Bisection method-C++ Program for Method of false position-C++ Program for Method of successive approximation-C++ Program for Newton-Raphson's method.	K2,K3	5
IV	C++ Program for Secant Method-C++ Program for Graeff's root squaring method-C++ Program for Gauss elimination method-C++ Program for Gauss Jordan method.	K4	5
V	C++ Program for Jacobian method-C++ Program for Gauss Seidal method-C++ Program for Largest eigen value by power method.	K5	4
Course Outcome	**CO1:** Remember the roots of algebraic equations using different methods like, Newton-Raphson method, Secant Method etc.	K1	
	CO2: Understand the system of algebraic equations using direct and iterative methods	K2	
	CO3: Solve C++ Program to compute roots of algebraic equations using Bisection method, Newton-Raphson method etc.	K3	
	CO4: Explain C++ Program to compute roots of algebraic equations using Secant method,Gauss Jordan method etc.	K4	

	CO5: Evaluate the C++ Program to solve the system of algebraic equations using the Jacobian method, Gauss Seidal method.	K5	

Learning Resources				
Text Books	1. R.M. Somasundaram and R.M. Chandrasekaran, "Numerical Methods with C++ Programming", Prentice Hall India Pvt. Ltd., New Delhi, 2005.			
Reference Books	1.Pallab Ghosh, "Numerical Methods with Computer Programs inC++", Prentice Hall India Pvt. Ltd., New Delhi, 2009. 2.T. Veerarajan and T. Ramachandran, "Numerical Methods withPrograms in C", Second Edition, McGraw Hill Education Pvt.Ltd, New Delhi, 2006.			
Website Link	1. https://youtu.be/PIPiv6gn_Ls 2. https://youtu.be/I41_Jd-7vn0 3. https://youtu.be/DWjjzeL_pKs			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc-Mathematics Syllabus LOCF- CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**	
23M2UMAS01	COMPUTATIONAL MATHEMATICS	SEC THEORY-I	II	2	2	-	-	2	

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M	S	S	S	S	M
CO2	M	S	S	M	M	S	M	S	S	S
CO3	S	S	S	S	S	M	S	S	S	S
CO4	S	M	M	S	S	S	S	M	S	S
CO5	S	S	S	S	S	M	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	**Verified By**	**Approved By**
Mrs.P.SUBHA	Dr.K.LOGAARASI	Head CDC

MUHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(Autonomous)
Rasipuram - 637408.

Skill Based Elective Course (SEC) for B.Sc., Mathematics
SYLLABUS - LOCF-CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M3UMAS02	STATISTICS WITH EXCEL PROGRAMMING	SEC THEORY - II	III	2	2	-	-	2

Objective	To Acquire the knowledge to students for Statistics with Excel Programming

Unit	Course Content	Knowledge Levels	Sessions
I	Distribution of data- Characteristics of data- Frequency distribution-Procedure for Constructing a Frequency Distribution Using Excel to Construct a Frequency Distribution-Relative Frequency Distribution-Cumulative Frequency Distribution. Chpater-2: Pages 58 to 66	K1	5
II	Histograms-Relative Frequency Histogram- Skewness-Using XLSTAT for Histograms-Graphs-Using Excel to Construct a Scatterplot - Correlation Coefficient. Chapter-2: Pages 70 to 81	K2	5
III	Time-Series Graph- Dot plots-Bar Graphs-Using Excel to Create Bar Graphs-Pie Charts-Using Excel to Create Pie Charts. Chapter-2: Pages 81,82,84-87	K3	5
IV	Descriptive statistics-Measures of Center-Mean-Using Excel to Calculate the Mean-Median-Using Excel to Find the Median. Chapter-3: Pages 110 to 114	K4	5
V	Mode-Using Excel to Find the Mode-Midrange-Using Excel to Calculate the Midrange-Weighted Mean-Using Excel for Descriptive Statistics. Chapter-3: Pages 114 to 125 **Current Trends - * Understanding Error values in Excel ***	K5	4
	* Self Study.		

Course Outcome	**CO1:** Describe distribution of data and analyzes the characteristics of data using Excel.	K1	
	CO2: Interpret the Normal distribution, common distribution shapes, Correlation Coefficient and plot graphs using Excel	K2	
	CO3: Compute Time-Series Graphs, Dotplots, Stemplots, Bar Charts, Pie Chart using Excel.	K3	
	CO4: Explain Mean and Median using Excel.	K4	
	CO5: Evaluate Mode, Midrange, Weighted Mean using Excel.	K5	

Learning Resources	
Text Books	1. Mario F. Triola,"Elementary Statistics Using Excel", Fifth Edition, Pearson New International Edition, 2014. (Chapter 2 and 3).
Reference Books	1. E. Balagurusamy, Statistical and Numerical Methods, Computer Oriented Macmillan Publishers India Limited, 2000. 2. V. K. Rohatgi, A. M. E. Saleh, An introduction to probability and statistics, John Wiley & Sons, 2015. 3. B. Held, B. Moriarty &T. Richardson, Microsoft Excel Functions and Formulas, Stylus Publishing, LLC, 2019. 4. N. J. Salkind, Excel statistics: A quick guide, Sage Publications, 2015.
Website Link	1. https://youtu.be/6osDRHWZtK8?si=M7qlK6YcPTeqPbn2 2. https://youtu.be/3F_V5alJubk?si=zypdjJ7yQFRItN-m 3. https://youtu.be/MQdyn7dD85o?si=SISw9GVFY2B2hG88
Self-Study Material	https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=1272379

	L-Lecture	T-Tutorial	P-Practical	C-Credit

MUHAYAMMAL COLLEGE OF ARTS AND SCIENCE
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Skill Based Elective Course (SEC) for B.Sc., Mathematics
SYLLABUS - LOCF-CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M3UMAS02	STATISTICS WITH EXCEL PROGRAMMING	SEC THEORY - II	III	2	2	-	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	M	M	S	S	S
CO2	M	M	S	S	M	S	S	M	M	S
CO3	S	S	S	M	S	S	M	S	S	M
CO4	M	S	S	M	S	S	S	S	M	S
CO5	S	S	S	S	S	S	M	S	S	M
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
Mrs.P.SUBHA	Dr.K.LOGAARASI	Member Secretary

Skill Based Elective Course (SEC) for B.Sc., Mathematics SYLLABUS - LOCF-CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UMAS03	QUANTITATIVE APTITUDE - I	SEC THEORY - III	III	2	2	-	-	2
Objective	The students develop strong mathematical skills that are crucial for various academic and professional pursuits, including competitive exams, higher education, and careers.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Arithmetical Ability:** Simple Interest – Compound Interest. (Chap – 22 & 23)	K1	5
II	**Arithmetical Ability:** Logarithms - Area. (Chap – 10 & 24)	K2	5
III	**Arithmetical Ability:** Volume & Surface Areas – Races & Games of Skill. (Chap – 25 & 26)	K3	5
IV	**Arithmetical Ability:** Calendar - Clocks. (Chap – 27 & 28)	K4	5
V	**Arithmetical Ability:** Stocks and Shares. (Chap – 29) **Current Trends-*A Letter Coding***	K5	4
	* Self Study.		

Course Outcome	**CO1:** Recall the Basic Knowledge of Simple Interest and Compound Interest.	K1	
	CO2: Understand the Concept of Logarithms and Area.	K2	
	CO3: Determine the Concepts of Area and Volume, Races and Games of Skill.	K3	
	CO4: Deduct the Concepts of Calendar and Clocks.	K4	
	CO5: Evaluate the concept of Stocks and Shares.	K5	

Learning Resources	
Text Books	1. Dr. R.S. Aggarwal, Quantitative Aptitude, S. Chand and Company Ltd., New Delhi, Reprint 2022.
Reference Books	1. Abhijit Guha, Quantitative Aptitude ,Tata McGraw Hill Publishing Company Limited, New Delhi, Reprint 2005.
Website Link	1. https://youtu.be/R5p7Noia3kk?si=UfTDo-CMYJ9KNvWH 2.https://youtu.be/cKu90Fn3EIg?si=JzcxSCcZxDdFYYxf 3.https://youtu.be/pCO3DjN2dpE?si=6ZSFSjK-b4BuOoH5
Self-Study Material	1.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=3017422&query=MATHS+REASONING

	L-Lecture	T-Tutorial	P-Practical	C-Credit

Skill Based Elective Course (SEC) for B.Sc., Mathematics
SYLLABUS - LOCF- CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M3UMAS03	QUANTITATIVE APTITUDE - I	SEC THEORY - III	III	2	2	-	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	S	S	S	S
CO2	S	S	S	S	S	S	S	S	M	S
CO3	S	M	S	S	M	S	S	S	S	M
CO4	S	M	M	S	S	M	S	S	S	S
CO5	S	S	S	M	S	S	S	M	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
A. Menaka	Dr.K.LOGAARASI	Member Secretary

Skill Based Elective Course (SEC) for B.Sc.,Mathematics SYLLABUS - LOCF-CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M4UMAS04	QUANTITATIVE APTITUDE - II	SEC THEORY - IV	IV	2	2	-	-	2
Objective	Students develop strong mathematical skills that are crucial for various academic and professional pursuits, including competitive exams, higher education, and careers.							

Unit	Course Content	Knowledge Levels	Sessions
I	Permutation and Combinations. (Chapter – 30)	K1	5
II	Probability – True Discount. (Chapter – 31, 32)	K2	5
III	Banker's Discount - Heights and Distances. (Chapter – 33, 34)	K3	5
IV	Odd Man Out and Series. (Chapter – 35)	K4	4
V	Tabulation – Bar Graphs. (Chapter – 36, 37) **Current Trends-* Relation Quiz***	K5	5
	* Self Study		

Course Outcome	**CO1:** Acquire Knowledge about Permutation and Combinations	K1	
	CO2: Understand Probability and True Discount	K2	
	CO3: Apply Banker's Discount and Heights & Distances.	K3	
	CO4: Analyze Odd Man Out and Series	K4	
	CO5: Deduct Tabulation and Bar Graphs	K5	

Learning Resources				
Text Books	1. Dr. R.S. Aggarwal, Quantitative Aptitude, S. Chand and Company Ltd., New Delhi, Reprint 2022.			
Reference Books	1. Abhijit Guha, Quantitative Aptitude, Tata McGraw Hill Publishing Company Limited., New Delhi. Reprint 2005.			
Website Link	1.https://www.youtube.com/watch?v=t-tWDCf86Ko 2.https://www.youtube.com/watch?v=iwScjuP87FA 3.https://www.youtube.com/watch?v=uuZWE7kpL0c			
Self-Study Material	1.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=3017422&query=MATHS+REASONING			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

Skill Based Elective Course (SEC) for B.Sc., Mathematics SYLLABUS - LOCF- CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards										
Course Code	**Course Title**			**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M4UMAS04	QUANTITATIVE APTITUDE - II			SEC THEORY - IV	IV	2	2	-	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	M	S	S	M
CO2	S	M	M	S	M	S	S	M	S	S
CO3	S	S	S	S	M	M	S	S	M	S
CO4	S	S	S	M	S	S	S	M	S	M
CO5	S	M	M	S	S	M	S	S	S	M
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	Audio Video lecture, Chalk and Board class, Assignment, PPT Presentation and Video presentation
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	**Verified By**	**Approved By**
A.Menaka	Dr.K.LOGAARASI	Member Secretary

Allied Subjects for Degree B.Sc., Physics, and B.Sc., Chemistry offered by the B.Sc., Mathematics LOCF-CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024
Onwards LIST OF GEC - ALLIED COURSES

S.No.	Sem	COURSE_CODE	TITLE OF THE COURSE
1	I	23M1UMAA01	ALLIED MATHEMATICS - I
2	II	23M2UMAA02	ALLIED MATHEMATICS - II
3	II	23M2UMAAP1	PRACTICAL : ALLIED MATHEMATICS

Allied Subjects for Degree BCA, B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology,B.Sc.,Computer Technology , B.Sc., Data Science, B.Sc. Artificial Intelligence & Machine Learning and B.Sc., Internet of Things offered by the B.Sc., Mathematics LOCF-CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 LIST OF GEC - ALLIED COURSES

S.No.	Sem	COURSE_CODE	TITLE OF THE COURSE
1	I	23M1UMAA03	DISCRETE MATEMATICS - I
2	I	23M1UMAA07	GRAPH THEORY AND ITS APPLICATIONS
3	I	23M1UMAA09	OPTIMIZATION TECHNIQUES
4	I	23M1UMAA11	NUMERICAL METHODS-I
5	II	23M2UMAA04	DISCRETE MATEMATICS - II
6	II	23M2UMAA08	NUMERICAL METHODS
7	II	23M2UMAA10	INTRODUCTION TO LINEAR ALGEBRA
8	II	23M2UMAA12	NUMERICAL METHODS-II

Allied Subjects for Degree B.Sc., Statisctics offered by the B.Sc.,Mathematics LOCF-CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024
Onwards LIST OF GEC - ALLIED COURSES

S.No.	Sem	COURSE_CODE	TITLE OF THE COURSE
1	I	23M1UMAA05	MATHEMATICS FOR STATISTICS
2	II	23M2UMAA06	REAL ANALYSIS
3	III	23M3UMAA13	NUMERICAL METHODS

Allied Subjects for Degree B.Sc., Physics and B.Sc., Chemistry offered by the Department of UG – Mathematics SYLLABUS – CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023 - 2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M1UMAA01	ALLIED MATHEMATICS - I	GEC THEORY- I	I	4	2	2	-	3
Objective	Learn the concepts of Characteristic equation and roots and basic concepts and problem solving in Theory of equations.							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**Matrices:** Definition of Characteristic equation of a matrix – Characteristic roots of a matrix – Eigen values and the corresponding Eigen vectors of matrix– Cayley Hamilton theorem (Statement only)–Verifications of Cayley Hamilton Theorem– Problems only. Chapter-5	K1,K2	10
II	**Theory of Equations:** Imaginary roots – Irrational roots – Formation of equations – Solution of equations –Descarte's rule of sign–Problems only. Chapter-6	K2	10
III	**Radius of Curvature:** Formula of Radius of Curvature in Cartesian coordinates, Parametric coordinates and Polar coordinates (no proof for formulae)– Problems only. Chapter-11	K3	10
IV	**Integration:** Definite Integral– Properties of Definite Integrals – Bernoulli's Formula – Integration by parts – Simple problems only. Chapter–15&16	K4	9
V	**Partial Differential Equations:** Formation of Partial Differential Equations by eliminating the arbitrary constant and arbitrary functions – Problems only. Chapter–26	K5	9
Course Outcome	**CO1:** Recall the basic concepts and gain the knowledge about binomial series	K1	
	CO2: Understand the exponential and logarithmic series	K2	
	CO3: Apply the application of relations between the roots and coefficients of an equation	K3	
	CO4: Analyze the method of solving reciprocal equations and diminishing the roots of an equation	K4	
	CO5: Evaluate the consistency of linear equations and application of Cayley -Hamilton theorem	K5	

Learning Resources				
Text Books	1.Dr.P.R.Vittal, Allied Mathematics, Margham publication, chennai-17, Reprint 2012.			
Reference Books	1.S.G.Venkatachalapathi, Allied Mathematics, Margham publication,Chennai-17, Reprint 2011.			
Website Link	1. https://nptel.ac.in/courses/111106146 2. https://onlinecourses.nptel.ac.in/noc22_ma13/preview 3. https://youtu.be/9MCjyQSRmR8			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(Autonomous)
Rasipuram - 637 408

Allied Subjects for Degree B.Sc., Physics and B.Sc., Chemistry offered by the Department of UG – Mathematics SYLLABUS – CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023 - 2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M1UMAA01	ALLIED MATHEMATICS - I	GEC THEORY- I	I	4	2	2	-	3

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	M	S	S	S	S
CO2	S	S	S	S	S	S	S	S	M	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	M	M	M	M	S	S	S
CO5	S	S	S	M	M	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
MOTHIDHRSHAA D	Dr.K.LOGAARASI	Head CDC

Allied Subjects for Degree B.Sc., Physics and B.Sc., Chemistry offered by the Department of UG- Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UMAA02	ALLIED MATHEMATICS - II	GEC THEORY -II	II	4	2	2	-	3

Objective	The course aims to learn about the first and second order differential equation and constant coefficient and definition of the laplace transform and its properties and understand the concept of Inverse Laplace transform and its properties.		
Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**Jacobian and Maxima & Minima:** Jacobian of two variables and three variables - Maxima and Minima of functions of two variables -Problems only Chapter : 9	K1,K2	10
II	**Finite Differences:** First difference- Higher differences - Construction of difference table - Interpolation of missing value-Newton's Forward and Newton's Backward difference formula (no proof)-Simple problems only. Chapter : 7	K2	10
III	**Second Order Differential Equations:** Second Order Differential Equations with constant coefficients- Complementary function-particular Integral and Solution of the type: e^{ax}, x^n, cos ax (or) sin ax – Problems only Chapter : 23	K3	10
IV	**Laplace Transforms:** Definition of Laplace Transforms - standard formula -Linearity property – Shifting property - Change of scale property - Laplace Transforms of derivatives- Problems. Chapter : 27	K4	9
V	**Inverse Laplace Transforms:** Standard formula - Elementary theorems (no proof) - Simple problems. Chapter : 27	K5	9
Course Outcome	**CO1:** Remembering the concepts of Jacobian and Maxima and Minima.	K1	
	CO2: Understanding the problem of Numerical Methods.	K2	
	CO3: Applying the concept of the second order differential equations with constant coefficients.	K3	
	CO4: Analysis the basic properties of Laplace Transforms.	K4	
	CO5: Evaluate the simple problems of inverse Laplace and its applications.	K5	

Learning Resources				
Text Books	1. Dr P R.Vittal, Allied Mathematics, Margham publication, Chennai-17, Reprint 2012.			
Reference Books	1. S.G. Venkatachalapathi, Allied Mathematics, Margham publication, Chennai- 17, Reprint, 2011.			
Website Link	1. https://byjus.com/maths/methods-of-solving-first-order-first-degree-differential- equations/ 2. https://www.cliffsnotes.com/study-guides/differential-equations/second-order-equations/constant-coefficients 3. https://www.cuemath.com/calculus/partial-differential-equations/			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

Allied Subjects for Degree B.Sc., Physics and B.Sc., Chemistry offered by the Department of UG- Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UMAA02	ALLIED MATHEMATICS - II	GEC THEORY -II	II	4	2	2	-	3

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	M	M	S	S	M	M	M	S	S	M
CO2	S	M	S	S	M	S	M	S	S	M
CO3	M	S	S	M	M	S	S	M	S	M
CO4	S	M	S	S	M	S	M	S	S	M
CO5	M	M	S	S	M	M	M	S	S	M
Level of Correlation between CO and PO	L-LOW			M-MEDIUM				S-STRONG		

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
MOTHIDHRSHAA D	Dr.K.LOGAARASI	Head CDC

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M1UMAA03	DISCRETE MATHEMATICS-I	GEC THEORY - III	I	4	2	2	-	3
Objective	The objective of this course to learn a mathematical logic, discrete structure and algorithmic thinking.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Mathematical Logic:** Introduction-Statement and Notation-Connectives-Negation- Conjunction-Disjunction-Statement Formulas and Truth Tables- Conditional and Biconditional – Well formed formulas-Tautologies. Chapter – 1 Section:1.1,1.2(1.2.1 -1.2.4 and 1.2.6-1.2.8)	K1,K2	12
II	**Normal Forms :** Disjunctive Normal Forms-Conjunctive Normal Forms-Principal Disjunctive Normal Forms-Principal Conjunctive Normal Forms **The Theory of Inference for the statement Calculus:** Validity using Truth Tables-Rules of Inference-Consistency of premises and indirect method of proof. Chapter – 1 **Section**:1.3(1.3.1 -1.3.4) Section:1.4(1.4.1 -1.4.3)	K2,K3	12
III	**Inference theory of the predicate calculus:** Valid Formulas and Equivalence – Some Valid Formulas over Finite Universe-Special Valid Formulas Involving Quantifiers –Theory of Inference for the Predicate Calculus. Chapter-1 Section:1.5(1.5.1-1.5.4) Section:1.6(1.6.1-1.6.4)	K3	10
IV	**Set Theory:** Introduction-Basic concepts of set theory-Notation-Inclusion and Equality of sets-The Power Set-Some Operation on sets-Venn Diagrams-Some Basic Set Identities-The Principle of Specification. Chapter-2 Section:2.1(2.1.1 -2.1.7)	K4	9
V	**Relation and Ordering:** Relations-Properties of Binary Relations in a set-Relation Matrix and the Graph of a Relation-Partition and Covering of a Set. **Function:** Definition and Introduction-Composition of Function-Inverse Function. Chapter-2 Section:2.3(2.3.1 -2.3.4) Section:2.4(2.4.1-2.4.3)	K5	9
	CO1: Knowledge about the concepts of Statements and Notations.	K1	
	CO2: Understanding the theory of inference for the statement calculus	K2	

Course Outcome	**CO3:** Applying the concepts of predicate calculus and Inference theory of the predicate calculus	K3
	CO4: Analyze the set theory and some operation on sets	K4
	CO5: Evaluate the relation and properties of Binary relation in a set	K5

Learning Resources

Text Books	1. J.P.Tremblay, R.Manohar, Discrete Mathematical Structure with Applications to Computer Science, Tata McGrew-Hill, 2011
Reference Books	1. Dr M.K.Son and Dr B.C.Charraborthy, Introduction to Discrete Mathematic, Son Books & Allied Pvt. Ltd. 8/1 Chintamani Das Lanc, Kokata-700009, Reprinted in 2016.
Website Link	1. https://old.amu.ac.in/emp/studym/99998829.pdf

	L-Lecture	T-Tutorial	P-Practical	C-Credit

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**	
23M1UMAA03	DISCRETE MATHEMATICS-I	GEC THEORY - III	I	4	2	2	-	3	

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	S	S	S	S
CO2	S	S	S	S	S	S	M	S	S	S
CO3	S	M	S	S	S	S	S	M	S	S
CO4	S	M	S	S	S	S	S	S	M	S
CO5	S	S	S	M	S	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
R.MOHAN RAM	Dr.K.LOGAARASI	Head CDC

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M2UMAA04	DISCRETE MATHEMATICS-II	GEC THEORY - IV	II	4	2	2	-	3
Objective	The objective of this course to learn Algebraic system, Groups, Boolean algebra and functions and graph theory.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Algebraic Systems Examples and General Properties:** Definition and Examples –Some Simple Algebraic Systems and General Properties. **Semigroups and Monoids:** Definition and Examples-Homomorphism of Semi groups and Monoids-Sub semigroups and Sub Monoids. Chapter-3 Section:3.1(3.1.1,3.1.2)Section:3.2(3.2.1-3.2.3)	K1,K2	12
II	**Groups:** Definition and Examples-Subgroups and Homomorphism-Cosets and Lagrange's theorem-Normal Subgroups-Algebraic system with two Binary operations. Chapter-3 Section:3.5(3.5.1 -3.5.5)	K2,K3	12
III	**Lattices as Partially ordered Sets:** Definitions and Example –Some Properties of Lattices-Lattices as Algebraic System-Sub lattices, Direct product and homomorphism. **Boolean Algebra:** Definitions and Example- Sub algebra,Direct product and homomorphism Chapter – 4 Section:4.1(4.1.1-4.1.4) Section:4.2(4.2.1-4.2.2)	K3	10
IV	**Boolean Function:** Boolean forms and Free Boolean algebras-Values of Boolean expression and Boolean Functions. Chapter-4 Section:4.3(4.3.1-4.3.2)	K4	9
V	**Graph Theory:** Basic Concepts of Graph Theory-Basic Definitions-Paths, Reachability and Connectedness- Matrix Representation of Graphs – Trees	K5	9

	Chapter-5 Section: 5.1(5.1.1- 5.1.4)		
Course Outcome	**CO1:** Knowledge about the concepts of algebraic system, Semigroups and Monoids.	K1	
	CO2: Understanding the groups,subgroups and homomorphism.	K2	
	CO3: Applying the concepts Lattices and Boolean Algebra.	K3	
	CO4: Analyze the basic concepts of Boolean Functions.	K4	
	CO5: Evaluate the matrix representation and trees.	K5	

Learning Resources				
Text Books	1. J.P.Tremblay, R.Manohar, Discrete Mathematical Structure with Applications to Computer Science, Tata McGrew-Hill, 2011			
Reference Books	1. Dr M.K.Son and Dr B.C.Charraborthy, Introduction to Discrete Mathematic, Son Books & Allied Pvt. Ltd. 8/1 Chintamani Das Lanc, Kokata-700009, Reprinted in 2016.			
Website Link	1. https://old.amu.ac.in/emp/studym/99998829.pdf			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**	
23M2UMAA04	DISCRETE MATHEMATICS-II	GEC THEORY - IV	II	4	2	2	-	3	

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	S	S	S	S
CO2	S	S	S	S	S	S	M	S	S	S
CO3	S	M	S	S	S	S	S	M	S	S
CO4	S	M	S	S	S	S	S	S	M	S
CO5	S	S	S	M	S	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
R.MOHAN RAM	Dr.K.LOGAARASI	Head CDC

Allied Subjects for Degree B.Sc., Statistics offered by the Department of UG – Mathematics SYLLABUS – CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UMAA05	MATHEMATICS FOR STATISTICS	GEC THEORY- V	I	4	2	2	-	3

Objective	The overall objective of the study is to create deep interest in learning mathematics which develop broad and balance knowledge and understanding definitions, concepts, principles and theorems.

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**Rational fractions:** Proper and improper rational fractions. Partial fractions Forms of partial fractions.	K1	10
II	**Series:** Summation and approximations related to Binomial, Exponential and Logarithmic series-Taylor's series.	K2	10
III	**Theory of equations:** Polynomial equations with real coefficients-imaginary and irrational roots-solving equations with related roots-equation with given numbers as roots.	K2,K3	10
IV	**Differential calculus:** Functions – Different types – simple valued and many valued – Implicit and Explicit functions, Odd and even functions, periodic functions, algebraic and transcendental functions.	K3,K4	9
V	**Successive differentiation:** Leibnitz's theorem, nth derivatives of standard functions – simple problems. **Partial differentiation:** Successive partial differentiation.	K5	9
Course Outcome	**CO1:** Recall the basic concepts of proper and improper fractions.	K1	
	CO2: Understand the exponential and logarithmic series	K2	
	CO3: Solve the problems about polynomials with real coefficients, imaginary and irrational roots.	K3	
	CO4: Analyze the standard function of differentiation by using addition and subtraction.	K4	
	CO5: Evaluate the maxima and minima functions of two variables and homogenous functions.	K5	

Learning Resources				
Text Books	1. Duraipandian, P. and Udaya Baskaran, S. (2014): Allied Mathematics, Vol. – I and II S.Chand and Company Pvt. Ltd. 2. Vittal, P.R, Allied Mathematics, Margham Publications, 2012. 3. Narayanan, S. Manickavachagam Pillai(1993): Ancillary Mathematics, Book II: (Containing Differential Calculus) S. Viswanathan Pvt, Ltd.			
Reference Books	1. Narayanan.S and Manickavachagam Pillai (1993): Ancillary Mathematics (Vol. II,Part I) : (Containing Trignometry) S. Viswanathan Pvt. Ltd . 2. Narayanan, S and Manickavachagam Pillai (1993): Ancillary Mathematics, Book I : (Containing Algebra). S. ViswanathanPvt.Ltd. 3. S.J.Venkatesan (2019), Algebra, Sri Krishna Publications ,Chennai-77 , skhengg1999@gmail.com			
Website Link	1. https://nptel.ac.in/courses/111106146 2. https://youtu.be/Wt6BFF3sVv4 3. https://youtu.be/opuc2K5tZR4			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Rasipuram - 637 408.

Allied Subjects for Degree B.Sc., Statistics offered by the Department of UG – Mathematics SYLLABUS – CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UMAA05	MATHEMATICS FOR STATISTICS	GEC THEORY- V	I	4	2	2	-	3

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	M	S	S	S	S
CO2	S	S	S	S	S	S	S	S	M	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	M	S	S	M	S	S	S	S
CO5	S	S	S	M	S	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
MOTHIDHRSHAA D	Dr.K.LOGAARASI	Head CDC

Allied Subjects for Degree B.Sc., Statistics offered by the Department of UG – Mathematics SYLLABUS – CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UMAA06	REAL ANALYSIS	DSE THEORY - VI	II	4	2	2	-	3

Objective	To study the basic operations of sets and functions, the structure of the real sequence and its convergence, series and its convergence, the limits, continuity and derivative of real valued functions and to know and apply the Riemann integration.

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	Operations on sets, Functions, Real valued functions, Equivalence, Countability, Real Numbers, Least Upper Bounds, Greatest Lower Bound.	K1	8
II	Definition of Sequence, Subsequence, Limit of a sequence, Convergent and Divergent sequences, Bounded and Monotone sequences, Operations on convergent sequences, Limit Infimum, Limit Supremum, Cauchy sequences.	K2	10
III	Definition of Series, Convergent and Divergent series, series with Non negative terms, alternating series, conditional convergence, absolute convergences and test for absolute convergence.	K3	10
IV	Limit of a function on the real line, Increasing and Decreasing functions, Continuous function, Rolle's Theorem, Lagrange's Mean value theorem, Taylor's theorem.	K4	10
V	Concept of Riemann Integral, Upper and Lower sums, Upper integral and Lower Integral Riemann integrability, Necessary and Sufficient condition for Riemann integrable.	K4, K5	10
Course	**CO1:** Understand the basic operations of sets and functions.	K1	
	CO2: Describe the sequence and its convergence	K2	
	CO3: Demonstrate the series and its convergence	K3	

Outcome	**CO4:** Construct the real valued functions and its discontinuity and understand integration concepts	K4
	CO5: Formulate the concept of probability functions as set functions and get knowledge on discrete and continuous nature of it.	K5

Learning Resources				
Text Books	1. Goldberg R.R., Methods of Real Analysis, Oxford & IBH Publishing Co.Pvt. Ltd, New Delhi,1976.			
Reference Books	1. Shanthinarayan, Real Analysis, S. Chand & Co, New Delhi, 2012. 2. Walter Rudin, Principles of Mathematical Analysis, 3rd Edition, McGraw-Hill, 2017.			
Website Link	1. https://tutorial.math.lamar.edu/classes/calci/thelimit.aspx 2. https://www.mathsisfun.com/calculus/derivatives-introduction.html 3. https://www.math.ucdavis.edu/~hunter/m125b/ch1.pdf 4. https://math.hmc.edu/calculus/hmc-mathematics-calculus-onlinetutorials/single-variable-calculus/taylors-theorem/ 5. http://www.ms.uky.edu/~droyster/courses/fall06/PDFs/Chapter06.pdf			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

Allied Subjects for Degree B.Sc., Statistics offered by the Department of UG – Mathematics SYLLABUS – CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**	
23M2UMAA06	REAL ANALYSIS	DSE THEORY - VI	II	4	2	2	-	3	

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	M	S	S	S	S
CO2	S	S	S	M	S	M	S	S	S	S
CO3	S	S	S	M	S	M	S	S	S	S
CO4	S	S	S	M	S	M	S	S	S	S
CO5	S	S	S	M	S	M	S	S	S	S
Level of Correlation Between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
Dr. K. LOGAARASI	Dr. K. LOGAARASI	Head CDC

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science, and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M1UMAA07	GRAPH THEORY AND ITS APPLICATIONS	GEC THEORY - VII	I	4	2	2	-	3
Objective	Students will be able to understand the fundamental concepts in graph theory.							

Unit	Course Content	Knowledge Levels	Sessions
I	Introduction – Definition – Examples – Degrees – Definition – Theorem 1, 2 – Problems – Subgraphs – Definition – Theorems – Operations on graphs – Definition theorem-1 – Problems. Chapter 2 (Sections 2.1 to 2.3, 2.9).	K1	10
II	Introduction – Walks, Trails and Paths – Definitions Theorem – 1, 2, 3 – Connectedness and components – Definitions – Theorems – Definition – Distance – Theorems – Cut point – Bridge – Blocks – Connectivity. Chapter 4 (Sections 4.1 to 4.4).	K2	10
III	Introduction – Eulerian Graphs – Definition – Lemmas – Theorem – Konigsberg Bridge problem – Fleury's Algorithms – Hamiltonian graphs – Definitions – Theorems – Lemma – Closure – Theorems. Chapter 5 (Sections 5.1, 5.2).	K3	10
IV	Introduction – Characterization of Trees – Theorems – Centre of a tree – Definition – Theorem. Chapter 6 (Sections 6.1, 6.2).	K4	9
V	Introduction - Applications – Connector problem – shortest path problem – Transformation and kinematic Graph. Chapter 11 (Sections 11.1 to 11.3) **Current Trends-* Directed Graphs***	K5	9
	* Self Study.		
	CO1: Define Graphs, Subgraphs and Operation on Graphs.	K1	

Course Outcome	**CO2:** Describe the concept of Walk, Trails and Paths.	K2	
	CO3: Interpret the Eulerian Graph and Hamiltonian graphs.	K3	
	CO4: Examine Characterization of Trees and Theorems.	K4	
	CO5: Develop Transformation and kinematics Graph.	K5	

Learning Resources

Text Books	1. S. Arumugam, S. Ramachandran, Invitation to graph theory, Scitech Publications, Chennai, 2001.
Reference Books	1. John clark and Derek Allan Holton, A first look at graph theory, Allied publishes, 1 May 1991. 2. S. Kumaravelu and SusheelaKumaravelu, Graph theory, Publishers Authors C/O.182, Childambara Nagar, Nagarkoil – 629 002.
Website Link	1. https://youtu.be/nEydJBhBX08 2. https://youtu.be/POjMICd2sdQ 3. https://youtu.be/tVuEZakQxhQ
Self-Study Material	1. https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=3330392&ppg=77

	L-Lecture	T-Tutorial	P-Practical	C-Credit

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science, and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M1UMAA07	GRAPH THEORY AND ITS APPLICATIONS	GEC THEORY - VII	I	4	2	2	-	3

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	M	S	S	S	M
CO2	M	S	M	M	S	S	S	M	S	S
CO3	S	S	S	S	M	S	S	S	S	S
CO4	M	S	M	S	S	S	M	M	S	S
CO5	S	S	S	S	S	S	S	S	M	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
R. Malathi	Dr.K.LOGAARASI	Member Secretary

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M2UMAA08	NUMERICAL METHODS	GEC THEORY - VIII	II	4	2	1	-	3

Objective	Students are able to understand about to solve mathematical problems and numerical approximations.

Unit	Course Content	Knowledge Levels	Sessions
I	**The Solution of Numerical Algebraic and Transcendental Equations:** Introduction - The Bisection Method – Iteration method - Newton Raphson Method. (Problems only) Chapter 3: Sections 3.1,3.2,3.4	K1	10
II	**Finite Differences :** Newton's Forward Interpolation Formula - Newton's Backward Interpolation Formula - Evaluation of missing terms- Lagrange's Interpolation Formula. (Problems only) Chapter : 7	K2	10
III	**Central Difference Interpolation Formulae :** Gauss Forward Interpolation Formula - Gauss Backward Interpolation Formula - Stirling's Formula – Bessel's Formula. (Problems only) Chapter 7: Sections 7.3,7.4,7.5,7.6	K3	10
IV	**Solution of simultaneous Linear Algebraic Equations:** Gauss elimination method – Gauss Jordan method – Gauss Jacobi method - Gauss - Seidal method. (Problems only) Chapter 4: Sections 4.2,4.2.1,4.8,4.9	K4	9
V	**Numerical Integration :** Trapezoidal Rule - Simpson's 1/3rd Rule - Simpson's 3/8th Rule - Weddle's Rule. (Problems only) Chapter 9: Sections 9.9,9.13,9.14,9.15 **Current Trends :* Transcendental and Polynomial Equations ***	K5	9

	* Self Study.		
Course Outcome	**CO1:** Recall the Algebraic methods and problems	K1	
	CO2: Understand the Newton's Forward Interpolation Formula Newton's Backward Interpolation Formula.	K2	
	CO3: Apply the concepts of Interpolation and Stirling's Formula.	K3	
	CO4: Analyze the Gauss Jacobi method, Gauss - Seidel method.	K4	
	CO5: Evaluate the Solution of Trapezoidal Rule.	K5	

Learning Resources

Text Books	1. P. Kandasamy, K. Thilagavathy and K. Gunavathy, Numerical Methods, S.Chand & Companyy Ltd., 2001 (UNIT I, III, IV, V) 2. Dr.P.R.Vittal, Allied Mathematics, Margham Publications,2007 (UNIT II)
Reference Books	1. S.S. Sastry, Introductory methods of numerical Analysis, 5th Edition, Prentice Hall of India Private Ltd., New Delhi.
Website Link	1. https://youtu.be/-Kqx_oOTgWY 2. https://youtu.be/hn00PydWK_4 3. https://youtu.be/mpkfYmnCZJw
Self-Study Material	1. https://nlist.inflibnet.ac.in/search/Record/ocn277056025

	L-Lecture	T-Tutorial	P-Practical	C-Credit

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(Autonomous)
Rasipuram-637408

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M2UMAA08	NUMERICAL METHODS	GEC THEORY - VIII	II	4	2	2	-	3

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	S	S	S	S
CO2	S	S	S	S	M	S	M	S	S	S
CO3	S	M	S	S	S	S	S	M	S	S
CO4	S	M	S	S	S	S	S	S	M	S
CO5	S	S	S	M	S	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
R.PARVATHA	Dr.K.LOGAARASI	Member Secretary

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M1UMAA09	OPTIMIZATION TECHNIQUES	GEC THEORY - IX	I	4	2	2	-	3
Objective	Students know about the concepts of Mathematical formulation and to find the solutions of Transportation and Assignment models.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Linear Programming Formulation and Graphical Method:** Introduction - Requirements for employing LPP technique – Mathematical Formulation of L.P.P. - Basic assumptions - Graphical method of the Solution of a L.P.P. – Some more cases – Advantage of Linear Programming – Limitations of Linear Programming. Chapter 2 (Sections 2.1 – 2.8)	K1	10
II	**Transportation Model**: Introduction - Mathematical formulation of a transportation problem - Methods for finding initial basic feasible solution – Transportation algorithm or MODI method – Degeneracy in Transportation problems–Unbalanced Transportation Problems – Maximization case in Transportation problems. Chapter 7 (Sections 7.1 – 7.5)	K2	10
III	**Assignment Problem**: Introduction – Mathematical formulation of an Assignment Problem –Difference between the Transportation Problem and Assignment Problem – Assignment Algorithm or Hungarian Method – Unbalanced Assignment Models – Maximization case in Assignment Problems. Chapter 8 (Sections 8.1 – 8.2, 8.4 - 8.7)	K3	10
IV	**Sequencing Problems**: Introduction – Assumptions of solving a sequencing Problem - Definition - Procedure for finding Optimum Sequence (n jobs on 2 machines) – Processing n jobs on three machines – Processing n jobs on m machines. Chapter 14 (Sections 14.1 – 14.6)	K4	9
V	**Scheduling by PERT and CPM**: Introduction – Basic Terminologies – Rules for constructing a project network –	K5	9

	Network computations – Floats – Programme Evaluation Review Technique (PERT) – Basic differences between PERT and CPM. Chapter 15 (Sections 15.1 – 15.7)		
Course Outcome	**CO1:** Formulate and solve real life problems through L.P.P.	K1	
	CO2: Compute the optimum Transportation schedule.	K2	
	CO3: Find the optimum Assignment model.	K3	
	CO4: Solve Sequencing problems.	K4	
	CO5: Use the techniques for planning and scheduling of projects.	K5	

Learning Resources

Text Books	1. Sundaresan. V., Ganapathy Subramanian, K.S. and Ganesan, K. Resource Management Techniques. [Seventh Edition], AR Publication, Chennai, 2013
Reference Books	1. Kantiswarup., Gupta, P.K. and Man Mohan, Operations Research, [Seventeenth Edition], Sultan Chand and Sons, New Delhi, 2020. 2. Gupta, P.K. and Hira, D.S. Operations Research, [Eighth Edition], Sulthan Chand and Company, New Delhi, 2020. 3. Kalavathy.S., Operations Research [Fourth Edition], Vikas Publishing House, Chennai, 2012.
Website Link	1. https://youtu.be/ku1KSgBfzs4 2. https://youtu.be/IE7Ea-oAotw 3. https://youtu.be/4B1J6UwLm4A

	L-Lecture	T-Tutorial	P-Practical	C-Credit

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
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Rasipuram - 637 408

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M1UMAA09	OPTIMIZATION TECHNIQUES	GEC THEORY - IX	I	4	2	2	-	3

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	M	S	S	S	S
CO2	S	S	M	S	S	S	S	M	M	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	M	S
CO5	S	S	S	M	M	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Problem solving session and Group Discussion
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and Talk method
Assessment Methods	CIA-I, CIA-II, Assignment and ESE.

Designed By	Verified By	Approved By
Mrs.G.Selvi	Dr.K.LOGAARASI	Head CDC

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M2UMAA10	INTRODUCTION TO LINEAR ALGEBRA	GEC THEORY -X	II	4	2	2	-	3

Objective	Students can get the ability of solving the Partial fraction, Binomial Series Exponential series and Logarithms Series. Acquire knowledge about Matrices and Cayley – Hamilton Theorem.		
Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	**Partial Fraction and Binomial Series** Partial Fraction-Resolution into partial fraction-Binomial theorem for a positive integral index-Binomial theorem for a rational index-Simple problems. Chapter-1 and 2	K1	10
II	**Exponential Series and Logarithms Series** Exponential series- Standard result for exponential series-Logarithms Series-Simple problems. Chapter-3 and 4	K2	10
III	**Matrices** Introduction- Type of matrix-Matrix Operations-Transpose of a matrix-Determinant of a matrix-Inverse of a matrix-symmetric and skew symmetric-Conjugate of a matrix-Hermitian and skew Hermitian matrix-Simple problems Chapter-5 (Page No:5.1 to 5.17)	K3	10
IV	**Rank of a Matrix** Orthogonal and Unitary matrix – Rank of a matrix- Test tor consistency of linear equation-Condition for consistency Chapter-5 (Page No:5.18 to 5.49)	K4	9
V	**Cayley Hamilton Theorem** Definition of Characteristic equation of a matrix –Characteristic roots of a matrix - Eigen values and the Corresponding Eigen vectors of matrix– Cayley Hamilton theorem (Statement only) – Verifications of Cayley Hamilton Theorem – Problems only. (Chapter 5) (Page No:5.50-5.74)	K5	9
Course Outcome	**CO1:** Define Partial Fraction and Binomial Series and examples	K1	
	CO2: Understand the Exponential Series and Logarithms Series and examples	K2	

	CO3: Apply the concepts of matrix and simple problems	K3
	CO4: Analyze the Rank of matrix and problems	K4
	CO5: Describe the Cayley Hamiltan Theorem	K5

Learning Resources	
Text Books	1. Dr.P.R. Vittal, Allied Mathematics ,Margham publication, Chennai– 17, Reprint 2016.
Reference Books	1. S.G Venkatachalapathi, Allied Mathematics, Margham publication, Chennai – 17, Reprint 2011 2. P. Kandasamy, K.Thilagavathy Allied Mathematics Volume I, S.Chand publication, July2012. 3. P. Kandasamy, K.Thilagavathy Allied Mathematics Volume II, S. Chand publication, December 2010.
Website Link	1. https://www.youtube.com/watch?v=wbZQW3l3G0 2. https://www.youtube.com/watch?v=BydVprh9NgQ 3. https://www.youtube.com/watch?v=cSj82GG6MX4

	L-Lecture	T-Tutorial	P-Practical	C-Credit

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M2UMAA10	INTRODUCTION TO LINEAR ALGEBRA	GEC THEORY - X	II	4	2	2	-	3	

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	M	S	S	M	S	S	S	S
CO2	S	S	M	S	S	S	S	M	M	S
CO3	S	S	S	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	S	M	S
CO5	S	S	S	M	M	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
A SUGANYA	Dr.K.LOGAARASI	Head CDC

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M1UMAA11	NUMERICAL METHODS-I	GEC THEORY - XI	I	4	2	2	-	3
Objective	Students learn about how to use computational techniques to solve complex mathematical problems accurately and efficiently.							

Unit	Course Content	Knowledge Levels	Sessions
I	**Solution of Algebraic and Transcendental Equations**: The Bisection Method - The method of false position- The Iteration method - Newton Raphson Method. (Chapter 2: Sections 2.2 to 2.5)	K1	10
II	**Solution of Algebraic and Transcendental Equations**: Generalized Newton's Method - Ramanujan's Method-The Secant Method - Muller's Method-Graeffe's Root squaring Method. (Chapter 2: Sections 2.6 to 2.9)	K2	10
III	**Interpolation:** Finite Difference - Forward Differences -Backward Differences - Central Differences - symbolic relations and separation of symbols-Detection of Errors by Use of Difference Tables. (Chapter 3: Sections 3.3(3.3.1 - 3.3.4),3.4)	K3	10
IV	**Interpolation**: Differences of Polynomial- Newton's formulae for interpolation – Central Differences interpolation formulae - Gauss Central difference formulae – Stirling's Formula - Bessel's Formula -	K4	9

	Everett's formula (Problems only). (Chapter 3: Sections 3.5,3.6,3.7(3.7.1 - 3.7.4))		
V	**Interpolation:** Lagrange's Interpolation Formula– Divided differences and their properties -Newton's general interpolation formula – Interpolation by iteration - Inverse Interpolation. (Problems only) (Chapter 3: Sections 3.9.1, 3.10, 3.10.1, 3.10.2,3.11) **Current Trends-*Analysis of elimination method***	K5	9
	* Self Study.		
Course Outcome	**CO1:** Acquire the knowledge about Iteration.	K1	
	CO2: Understand Solution of Algebraic and Transcendental Equations.	K2	
	CO3: Determination the concept of Interpolation and Operators.	K3	
	CO4: Analyze the Newton's formulae for interpolation.	K4	
	CO5: Deduct the Lagrange's Interpolation Formula.	K5	

Learning Resources				
Text Books	1. S.S. Sastry, Introductory Methods of Numerical Analysis, 5th Edition, Prentice-Hall of India Private Ltd, New Delhi,2012.			
Reference Books	1. P. Kandasamy, K. Thilagavathy, K. Gunavathy -Numerical Methods, Third Revised Edition, S.Chand & Company Ltd., Ram Nagar, New Delhi,Reprint 2005.			
Website Link	1. https://youtu.be/qEecNyRa5o4?feature=shared 2. https://youtu.be/lkfIgh9jgNQ?feature=shared 3. https://youtu.be/SK66ZW9CeQQ?feature=shared			
Self-Study Material	1.https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=313790			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M1UMAA11	NUMERICAL METHODS-I	GEC THEORY - XI	I	4	2	2	-	3

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	M	S	S	S	S
CO2	S	M	S	M	S	M	S	M	S	S
CO3	M	S	M	S	S	S	S	S	S	S
CO4	S	S	S	S	S	S	S	M	S	S
CO5	S	S	S	M	S	M	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
A.Menaka	Dr.K.LOGAARASI	Member Secretary

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern

EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M2UMAA12	Numerical Methods-II	GEC THEORY - XII	II	4	2	2	-	3

Objective	Students can able to understand the Numerical methods is a mathematical tool designed to solve numerical problems.

Unit	Course Content	Knowledge Levels	Sessions
I	Introduction- Numerical Differentiation - Maximum and minimum values of Tabulated function. Chapter 6: Sections 6.1 – 6.3	K1,K2	10
II	Numerical Integration-Trapezoidal Rule – Simphson 1/3 Rule - Simphson 3/8 Rule -Boole's and Weddle's rule. (Problems only) Chapter 6: Sections 6.4	K2,K3	10
III	Direct method – Gauss elimination Method – Necessity for Pivoting - Gauss Jordan Method - Modification of the Gauss Method to compute the inverse -Number of Arithmetic Operations - LU Decomposition Method - LU Decomposition from Gauss Elimination. Chapter 7: Sections 7.5 (7.5.1-7.5.6,7.5.8)	K3	10
IV	Solution of Linear Systems - Iterative Methods -Gauss Jacobi method - Gauss seidel Method. (Problems only) Chapter 7: Sections 7.6	K4	9

V	Solution by Taylor's Series-Picard's Method of Successive Approximations-Eluler's Method-Runge-Kutta Method. Chapter 8: Sections 8.2 to 8.5 **Current Trends-* Error Estimates***	K5	9
	* Self Study.		
Course Outcome	**CO1:** Remember the Numerical differentiation and problems	K1	
	CO2: Illustrate the Numerical Integration and problems	K2	
	CO3: Apply the direct methods and number of arithmetic operations related problems	K3	
	CO4: Analyze the Method of factorization and problems	K4	
	CO5: Deduct the solution by Taylor's Series and problems	K5	

Learning Resources	
Text Books	1. S.S. Sastry, Introductory Methods of Numerical Analysis, 5th Edition, Prentice-Hall of India Private Ltd, New Delhi,2012.
Reference Books	1. P. Kandasamy, K. Thilagavathy, K. Gunavathy -Numerical Methods, Third Revised Edition, S.Chand & Company Ltd., Ram Nagar, New Delhi,Reprint 2005.
Website Link	1. https://youtu.be/YUMIjyz5LAY?feature=shared 2. https://youtu.be/zadUB3NwFtQ?feature=shared 3. https://youtu.be/EpsTPI7tkYQ?feature=shared
Self-Study Material	1. https://ebookcentral.proquest.com/lib/inflibnet-ebooks/reader.action?docID=221072&ppg=7

	L-Lecture	T-Tutorial	P-Practical	C-Credit

Allied Subjects for B.Sc., Computer Science, B.Sc., Electronics and Communication, B.Sc., Information Technology, B.Sc., Internet of Things, B.Sc., Data Science and B.C.A offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern

EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M2UMAA12	Numerical Methods-II	GEC THEORY - XII	II	4	2	2	-	3

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	S	S	S	S
CO2	S	S	S	S	S	S	M	S	S	S
CO3	S	M	S	S	S	S	S	M	S	S
CO4	S	M	S	S	S	S	S	S	M	S
CO5	S	S	S	M	S	S	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
MOTHIDHRSHAA D	Dr.K.LOGAARASI	Member Secretary

Allied Subjects for B.Sc., Statistics offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M3UMAA13	NUMERICAL METHODS	GEC THEORY - XIII	III	4	2	2	-	3
Objective	To emphasize on the study of algorithms that used numerical approximation for the problems Of mathematical analysis and solve mathematical problems numerically for students.							

Unit	Course Content	Knowledge Levels	Sessions
I	**The Solution of Numerical Algebraic and Transcendental Equations:** Introduction - The Bisection Method – Iteration method - Newton Raphson Method. (Problems only) Chapter 3: Sections 3.1, 3.2, 3.4	K1	10
II	**Finite Differences :** Newton's Forward Interpolation Formula - Newton's Backward Interpolation Formula - Evaluation of missing terms- Lagrange's Interpolation Formula. (Problems only) Chapter : 7	K2	10
III	**Central Difference Interpolation :** Gauss Forward Interpolation Formula - Gauss Backward Interpolation Formula - Stirling's Formula – Bessel's Formula. (Problems only) Chapter 7: Sections 7.3, 7.4, 7.5, 7.6	K3	10
IV	**Solution of simultaneous Linear Algebraic Equations:** Gauss elimination method – Gauss Jordan method – Gauss Jacobi method - Gauss - Seidal method. (Problems only) Chapter 4: Sections 4.2, 4.2.1, 4.8, 4.9	K4	9
V	**Numerical Integration :** Trapezoidal Rule - Simpson's 1/3rd Rule - Simpson's 3/8th Rule - Weddle's Rule. (Problems only) Chapter 9: Sections 9.9, 9.13, 9.14, 9.15 **Current Trends :* Transcendental and Polynomial Equations ***	K5	9

Course Outcome	**CO1:** Solve Algebraic methods and problems	K1	
	CO2: Understanding the Newton's Forward Interpolation Formula Newton's Backward Interpolation Formula	K2	
	CO3: Applying the concepts of Interpolation and Stirling's Formula	K3	
	CO4: Analyze the Gauss Jacobi method, Gauss - Seidal method	K4	
	CO5: Evaluate the Solution of Trapezoidal Rule	K5	

Learning Resources				
Text Books	1. P. Kandasamy, K. Thilagavathy, K. Gunavathy, Numerical Methods, S.Chand & Companyy Ltd., 2001 (UNIT I, III, IV, V) 2. Dr.P.R.Vittal, Allied Mathematics, Margham Publications,2007 (UNIT II)			
Reference Books	1. S.S. Sastry, Introductory methods of numerical Analysis, 5th Edition, Prentice Hall of India Private Ltd., New Delhi.			
Website Link	1. https://youtu.be/-Kqx_oOTgWY 2. https://youtu.be/hn00PydWK_4 3. https://youtu.be/mpkfYmnCZJw			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

Allied Subjects for B.Sc., Statistics
offered by the Department of UG Mathematics SYLLABUS - CBCS Pattern
EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem.	Hours	L	T	P	C
23M3UMAA13	NUMERICAL METHODS	GEC THEORY - XIII	III	4	2	2	-	3

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	S	S	S	S
CO2	S	S	S	S	M	S	M	S	S	S
CO3	S	M	S	S	S	S	S	M	S	S
CO4	S	M	S	S	S	S	S	S	M	S
CO5	S	S	S	M	S	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	Problem solving session and Group Discussion.
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	CIA-I, CIA-II, Assignment and ESE

Designed By	Verified By	Approved By
Mrs. P.SUBHA	Dr.K.LOGAARASI	Member Secretary

Allied Subject for Degree B.Sc., Physics and B.Sc., Chemistry offered by the Department of UG– Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M2UMAAP1	PRACTICAL: ALLIED MATHEMATICS	GEC PRACTICAL	II	2	-	-	2	2
Objective	The language provides an interpreted programming environment with matrices as the main data type. By using matrix-based computation, dynamic typing, and automatic memory management, many numerical problems may be expressed in a reduced number of code lines.							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
1	Elementary Math and Trigonometric functions	K1	2
2	Largest of list of Numbers	K2	2
3	User input vector	K2	2
4	User input Matrix	K2	2
5	Matrix Multiplication	K3	2
6	Finding determinant and inverse of a Matrix	K3	2
7	Transpose of a Matrix	K4	2
8	Bisection Method	K4	2
9	False Position Method	K5	2
10	Newton Raphson Method	K5	2
Course Outcome	**CO1:**Recall the basic concepts in scilab	K1	
	CO2: Understand the need for simulation/implementation for the verification of mathematical functions.	K2	
	CO3: Apply mathematical Modelling in scilab	K3	
	CO4: Analyze plot results	K4	
	CO5: Evaluate Numerical methods in Scilab	K5	

Learning Resources				
Text Books	1. Stephen L. Campbell, Jean-Philippe Chancelier and Ramine Nikoukhah, Modeling and Simulation in Scilab/Scicos, Springer, 2000.			
Reference Books	1. G. Allaire and S. Kaber. Introduction a Scilab – Exercices pratique corriges d'algebra lineaire, Ellipses, Paris, 2002.			
Website Link	1.https://www.youtube.com/watch?v=6TTvXPZM1yo 2.https://www.youtube.com/watch?v=alYUTBjEXks 3.https://www.youtube.com/watch?v=4PtGDpnA2rE 4.https://www.youtube.com/watch?v=csisfSaswRQ 5.https://www.youtube.com/watch?v=nTw710_aeZc 6.https://www.youtube.com/watch?v=n0E6WIvPUk0 7.https://www.youtube.com/watch?v=Beg86vKrBOs 8.https://www.youtube.com/watch?v=f90pejG3gO0&t=585s 9.https://www.youtube.com/watch?v=A2wUoDGtmso 10.https://www.youtube.com/watch?v=h2CSRxa3KFM			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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Rasipuram - 637 408.

Allied Subject for Degree B.Sc., Physics and B.Sc., Chemistry offered by the Department of UG– Mathematics SYLLABUS - CBCS Pattern EFFECTIVE FROM THE ACADEMIC YEAR 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M2UMAAP1	PRACTICAL: ALLIED MATHEMATICS	GEC PRACTICAL	II	2	-	-	2	2

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	S	S	M	S	S	S
CO2	S	M	S	S	S	S	M	S	S	S
CO3	S	M	S	S	S	S	S	S	S	S
CO4	S	S	S	M	S	S	S	S	S	S
CO5	S	S	S	M	S	S	S	S	S	S
Level of Correlation between CO and PO	L-LOW			M-MEDIUM			S-STRONG			

Tutorial Schedule	_
Teaching and Learning Methods	Lecture, Smart class presentation.
Assessment Methods	Model Practical

Designed By	Verified By	Approved By
MOTHIDHRSHAA D	Dr.K.LOGAARASI	Head CDC

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
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Rasipuram – 637408

B.Sc.-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M5UMAIS1	INTERNSHIP	INTERNSHIP	V	-	-	-	-	2
Objective	To give the students about optimum exposure on the practical aspects of mathematics in Industries							

Course Content	**Knowledge Levels**	**Sessions**
1. Duration of the internship training is 15 days during the Vacation which falls at the end of the 4th Semester. 2. The individual student has to identify the institution / industry / practitioners of their choice and inform the same to the HOD / Staff-in-charge. 3. The students hereafter will be called Interns should maintain a work diary in which the daily work done should be entered and the same should be attested by the Section in-charge. 4. The departments should prepare an work diary of the job to be done, Sections in which they have to be attached both in the office as well as in the field. 5. The Interns should strictly adhere to the rules and regulations and office timings of the institutions to which they are attached. 6. The Interns have to obtain a certificate on successful completion of the internship from the Chief Executive of the organization. 7. A Staff member of a Department (Guide) will be monitoring the performance of the Candidate.	K2	

8. Schedule of visit to be made by the staff is to be prepared by the HOD / Staff-in-charge. 9. All model forms are to be attached wherever it is necessary. 10. Report should be properly submitted after the completion of internship training. 11. Report evaluation: External Viva-Voce examination will be conducted. 12. Recommendation of the Viva Voce: Commented (or) Highly Commented / No marks will be awarded in the Mark sheet * Industry Practical Hours			
Course Outcome	**CO1:** Understand the practical knowledge of working in Institution/Industry.	K2	
Learning Resources			
Website Link	-		
Self-Study Material	-		

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. -Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards

Course Code	Course Title	Course Type	Sem	Hours	L	T	P	C
23M5UMAIS1	INTERNSHIP	INTERNSHIP	V	-	-	-	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M	S	M	S	S	S
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	-
Teaching and Learning Methods	-
Assessment Methods	CIA -100 % 1. Work Diary – 40% 2. Training Report – 40% 3. Viva-voce – 20%

Designed By	Verified By	Approved By
SELVI G	Dr.K.LOGAARASI	Member Secretary

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(Autonomous)
Rasipuram - 637408.

B.Sc.-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UMAPR1	PROJECT WORK	PROJECT	VI	5	-	-	5	4

Objective	Students can apply relevant concepts to formation of problems. . Apply scientific principles and investigations of Research Methodology to offer solutions to the problems. . Understand live organisational situations. ❖ The primary objective of the full semester project is to provide an opportunity to our students to format the problem from the real life situation and find the solution to the problem by using analytical and problem solving skills. Project Period: The project commences from VI semester.

Details	**Course Content**	**Knowledge Levels**	**Sessions**
Format for the preparation of Project Report:	The final stage of work consists of the 1. Title Page 2. Bonafide Certificate 3. Acknowledgement/Preface 4. Table of contents 5. Main Chapter 6. List of table, diagram and charts 7. Conclusion 8. References		

Text of the Project	The following structure of project work should be followed to maintain the uniformity in preparation and presentation. **Chapter 1 - Introduction** In this chapter Selection and relevance problem, historical background of the problem, definitions of related aspects, characteristics, different concepts pertaining to the problem etc can be covered by the candidate. **Chapter 2 - Research Methodology** This chapter will include Objectives, Hypothesis, Scope of the study, Selection of the problem, Data collection, Tabulation of data, Techniques and tools to be used, limitations of the study, significance of the study etc. **Chapter 3 - Literature Review** This chapter will provide information about studies done on the respective issue. This would assist students to undertake further study on the same issue. **Chapter 4 - Data Presentation and Data Analysis** This chapter is the core part of the study. The analysis pertaining to collecting data will be done by the students. The application of selected tools or techniques will be used to arrive at findings. In this table of information, presentation of graphs etc. should be provided by the students. **Chapter 5- Conclusion** In this unit, findings of work will be covered by the candidate and suggestions will be mentioned by the candidate to validate the objectives and hypotheses. **If required, more chapters of data analysis could be added.** **6. Bibliography** **7. Appendix** **Typing Instruction:** **Paper :** 8 ½ * 11 inches in size. Only one side of the sheet should be typed. **Margin:** The left side margin should not be less than 1.5 inches (or 40 mm) the right, top and Bottom Margin one inch (or 25 mm). **Font :** Times New Roman, subject matter -12 font size in running format, Heading and Section headings should be capitalized – 14 font size.	K4	15

Headings and Titles:	1. Heading and Section headings should be capitalized and centred– 14 font sizes with Bold. 2. Subdivision headings should be typed from the left hand margin sentence case -12 font sizes with Bold. 3. Paragraphs should be indented seven spaces for pica type and nine for elite type.	K3-K4	15
Tables, Graphs and Diagrams:	**1.** The table number (Example: TABLE 1.5) typed in capitals, should be separated from the text by two or three spaces. 2. If an explanatory note to a time is necessary, an asterisk should be used. 3. The note should be placed immediately below the table.	K4	15
	Line Spacing: The text of the thesis should be 1.5 lines spacing **Pagination:** Pages of the text are numbered continuously in Arabic numerals.	K5	15
	Foot note: Footnote citation is indicated by placing an index number i.e. a superscript or numeral. The superscript numeral must appear at the top of the line both in the text and in a footnote. Footnotes are single spaced, with double spacing between two consecutive citations. Footnote is numbered consecutively within each chapter or throughout the entire report. **Basic Format:** Author's name, title of the work, Place of publication: Publisher's name, year, Page no, (s). Note of punctuations. Page number to be preceded by "p" if single or "pp" if two or more pages. Title to be underlined.		
	Bibliography: The format for bibliographic listing for books, reports, articles are the same for footnotes also. Books and articles can be arranged either chronological order or year wise. **For citing Books:** Mann, R.S Social Change and Social Research, New Delhi: Concept Publishing Company, 2018, p.27 **Publication of Government and Public Organization:** Government of India, India 2016: A Reference Annual, New Delhi: Publication Division, 201, p.127		

	Quoting from Secondary Sources: Gand, William. S., "Foreign Aid: What it is; how it works; why we provide it", Department of State Bulletin, 59, No.1537, 1958, quoted in Todaro, Michael P., Economic Development in the Third world, New York, Longman, 1981, p.40. **Citing Journal:** GoelRanjan, "Achievement through Human Engineering", Indian Management, 28, No.8, July, 2016, pp.14-16 **Citing Thesis or Dissertation:** Ganapathy , A study of organizational and Individual Characteristics in R & D Organizations, unpublished Ph.D Thesis, Bangalore: Indian Institute of Science, 2016. **For Citing Seminar Paper:** Krishnaswami O.R., "Towards Excellence in Cooperative Management" (Paper Presented at a Seminar on "Excellence in Management", Cooperative Training College, Bangalore, July 2019).		
SCHEDULE	**VI Semester:** 1. December -Identification of problem & Selection of topic 2. January - Review of Literature & Finalization of Questionnaire 3. February - Data collection & Analysis and preparation of Project report. 4. March - First & Second draft and Final draft Correction. 5. April - Review Presentation & Submission of Project.		
Course Outcome	CO1: Understand the Selection of the problem.	K2	
	CO2: Interpret Hypothesis and Objectives.	K3	
	CO3: Analyze the literature review based on the research problem.	K4	
	CO4: Evaluate the data collection.	K5	
	CO5: Create and conclude the Project report.	K6	

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc. -Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**	
23M6UMAPR1	PROJECT WORK	PROJECT	VI	5	-	-	5	4	

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	M	M	M	M	M	S	S
CO2	S	M	M	M	M	M	M	M	S	S
CO3	S	M	M	M	M	M	M	M	S	S
CO4	S	M	M	M	M	M	M	M	S	S
CO5	S	M	M	M	M	M	M	M	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	-
Teaching and Learning Methods	-
Assessment Methods	Internal Evaluation – 40 Marks External Evaluation – 60 Marks

Designed By	Verified By	Approved By
Dr.K.LOGAARASI	Dr.K.LOGAARASI	Member Secretary

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
23M6UMAOE1	Mathematics for Competitive Examinations	Professional Competency Skill	VI	-	-	-	-	2
Objective	Creating the awareness of competitive examination among students. Imparting knowledge about the appearing for Competitive Examination and it impacts and develops an attitude of appearing for such exams.							
Unit	**Course Content**						**Knowledge Levels**	**Sessions**
	Assemblage of different topics related to Mathematics in particular, Classical Algebra, Calculus, Analytical geometry of 2D and 3D, Trigonometry and Vector Analysis, Differential Equations, Laplace Transforms and Fourier Series, Abstract Algebra, Linear Algebra, Real Analysis, Complex Analysis, Discrete Mathematical Structures, Operations Research, Numerical Analysis, Quantitative Aptitude. Major emphasis has been put forth to include recent developments in the subjects. This course aims to give a holistic view of all the topics which comprised of some factual text points, multiple choice questions (MCQ), it is extremely suitable for students pursuing their higher degree in University/institute for their entrance exams, students preparing for various national and state level competitive entrance exams such as TNPSC, IBPS, UPSC, RRB, SSC, GATE, TRB. **Rules for creating MCQ pattern.** 1. Objective type online examination will be conducted at the end of 6^{th} semester. 2. Questions must be taken from all previous question papers of TNPSC, IBPS, UPSC, RRB, SSC, GATE, and TRB. 3. **Test critical thinking**. Multiple choice questions to test the superficial knowledge. Learners to interpret facts, evaluate situations, explain cause and effect, make inferences, and predict results.						K1-K5	

4. **Emphasize Higher-Level Thinking**

Use memory-plus application oriented questions. These questions require students to recall principles, rules or facts in a real life context.

Eg.1

Ability to Justify Methods and Procedures

Which one of the following sequence is convergent?

a. $\frac{1}{n}$

b. n^2

c. n^n

d. $\frac{1}{n^{-3}}$

Eg.2

Ability to Interpret Cause-and-Effect Relationships

When the inverse of the matrix is possible?

a. Singular Matrix.

b. Zero Matrix.

c. Matrix with all the entries are same.

d. Non-singular Matrix.

5. Mix up the order of the correct answers

Keep correct answers in random positions and don't let them fall into a pattern that can be detected

6. **Use a Question Format**

Multiple-choice items to be prepared as questions (rather than

	incomplete statements) Incomplete Statement Format: The capital of California is in Direct Question Format------ Less effective. In which of the following cities is the capital of California? -This is Best format. 7. **Keep Option Lengths Similar** Avoid making your correct answer the long or short answer 8. **Avoid the "All the Above" and "None of the Above" Options** Students merely need to recognize two correct options to get the answer correct 9. HOD's instruct the faculty to prepare a minimum 500 questions booklet (cumulatively for each programme) with solutions and circulate among the students. 10. Each Department to prepare the Questions (MCQ pattern with four answers) and submit to ICT.		
Course Outcome	**CO1:** Able to attend competitive Examinations	K1	
	CO2: Interpret the Computer Based Examinations	K2	
	CO3: Solve the TNPSC, UPSC, RRB Mathematics related questions	K3	
	CO4: Analyze the all concepts in one examination	K4	
	CO5: Evaluate the Mathematics concepts in Real Life	K5	

Learning Resources

Learning Resources	UG Level Textbooks
Website Link	1. https://onlinecourses.swayam2.ac.in/cec23_ma19/preview 2. https://onlinecourses.nptel.ac.in/noc23_ma87/preview 3. https://onlinecourses.nptel.ac.in/noc23_ma85/preview

	L-Lecture	T-Tutorial	P-Practical	C-Credit

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2023-2024 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem**	**Hours**	**L**	**T**	**P**	**C**
23M6UMAOE1	Mathematics for Competitive Examination	Professional Competency Skill	VI	-	-	-	-	2

CO-PO Mapping

CO Number	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	M	M	M	M	M	S	M	M	M
CO2	S	M	M	M	M	M	S	M	M	M
CO3	S	M	M	M	M	M	S	M	M	M
CO4	S	M	M	M	M	M	S	M	M	M
CO5	S	M	M	M	M	M	S	M	M	M
Level of Correlation between CO and PO	L-LOW					M-MEDIUM			S-STRONG	

Tutorial Schedule	TNPSC, IBPS, UPSC, RRB, SSC, GATE, TRB Old question papers –solutions – online mock test
Teaching and Learning Methods	Self study
Assessment Methods	100 multiple choice questions through computer based online examinations passing minimum is 50%

Designed By	Verified By	Approved By
MOHANAPRIYA B	Dr.K.LOGAARASI	Member Secretary

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (Autonomous)

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)
RASIPURAM, NAMAKKAL – 637 408, TAMILNADU, INDIA

Affiliated to Periyar University, Salem
Accredited by NAAC with 'A' Grade
Recognized by UGC under Section 2(f) & 12 (B)

DEPARTMENT OF MATHEMATICS
B.Sc., Mathematics & M. Sc Mathematics Programme

Minutes of the Board of Studies

BOS Meeting held on 27.05.2024 at 'D' Block Meeting Hall in Muthayammal College of Arts and Science (Autonomous), Rasipuram.

The following points were discussed and approved by B.O.S members for the academic year 2024-2025 Syllabus.

- **I Year B. Sc. Mathematics and M. Sc. Mathematics Programme (AY 2024-2025)**

  Scheme and syllabi (Except the following) have to be followed for the students admitted from the academic year 2023-2024 and onwards.

- The Board recommended the following Courses are revised in the syllabi have to be followed for the students admitted from the academic year 2024-2025 and onwards.

S. No	Part	Study Components	Course Code	Sem	Title of The Course	Hrs./W		Credit Points	Max.Marks			Remarks
						Lect	Lab		CIA	ESE	Total	
1	III	DSC THEORY - III	23M2UMAC03	II	ANALYTICAL GEOMETRY (TWO AND THREE DIMENSIONS)	4	-	4	25	75	100	COURSE REVISED
2	IV	SEC THEORY - I	23M2UMAS01	II	COMPUTATIONAL MATHEMATICS	2	-	2	25	75	100	COURSE REVISED

- **II Year B. Sc. Mathematics and M. Sc. Mathematics Programme**

  Scheme and syllabi have to be followed for the students admitted from the academic year 2023-2024 and onwards.

- **III Year B. Sc. Mathematics Programme**

  Resolved to unanimously approve the scheme of examination, syllabi and regulations for the V and VI Semester of B.Sc. Mathematics programme from the academic year 2021-2022 and onwards.

- **All the Science Students**

  The Board resolved and approved the Incorporation of Following Value Added Course "Sagemath" offered for Final Year UG programme.

  The Board resolved and approved the Incorporation of Following Value Added Course "Data Analytics Using R" offered for Final Year PG programme.

- Dr.V.Rajadurai suggested to change the Text Book of the subjects Mathematical Modelling & Number Theory in B.Sc. Mathematics syllabus.

- Dr. M. Joseph Paramasivam suggested the change of some topics of the subjects Analytical Geometry (Two and Three dimensions), Integral Calculus, Bridge Mathematics, Computational Mathematics in B.Sc. Mathematics Programme from the academic year 2024-2025 and onwards.

- Dr.V. Rajadurai suggested the changes in some topics of the Allied subject Real Analysis for B.Sc. Statistics Programme from the academic year 2024-2025 and onwards.

- Dr. M. Joseph Paramasivam suggested the change of the Allied syllabus Discrete Mathematics - II to Numerical Methods for B.Sc. Computer Science, Information Technology, Data Science, Electronics and Communication, Internet of Things & BCA Programmes from the academic year 2024-2025 and onwards.

- All the BOS Members recommended the Text Books for reference should be in recent years.

Board Chairman Signature
HEAD OF THE DEPARTMENT
DEPARTMENT OF MATHEMATICS
MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS)
RASIPURAM (Tk), NAMAKKAL (DT)-637 408.

Principal Signature
PRINCIPAL
MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS)
RASIPURAM (Tk), NAMAKKAL (DT)-637 408

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
(Autonomous)
Rasipuram - 637 408

B.Sc - Mathematics Syllabus LOCF-CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
24M2UMAC03	ANALYTICAL GEOMETRY (TWO AND THREE DIMENSIONS)	DSC THEORY - III	II	4	4	-	-	4
Objective	Necessary skills to analyze characteristics and properties of two- and three-dimensional geometric shapes. To present mathematical arguments about geometric relationships. To solve real world problems on geometry and its applications.							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	Pole, Polar - conjugate points and conjugate lines – diameters – conjugate diameters of an ellipse - semi diameters (Book1: Chapter9)	K1	10
II	Conjugate diameters of hyperbola-Rectangular Hyperbola-Concyclic points on the Rectangular Hyperbola. (Book1: Chapter 10)	K2	10
III	Polar coordinates: General polar equation of straight line – Polar equation of a circle given a diameter, Equation of a straight line, circle, conic – Equation of chord, tangent, normal. Equations of the asymptotes of a hyperbola. (Book2: Chapter9)	K2,K3	10
IV	System of Planes-Length of the perpendicular–Orthogonal projection. Representation of line–angle between a line and a plane – co – planar lines–shortest distance between two skew lines. (Book3: Chapter2: Sections 2.5,2.7,2.9) (Book3: Chapter3: Sections 3.1, 3.2, 3.4, 3.6).	K4	9
V	Equation of a sphere-general equation-section of a sphere by a plane-equation of the circle- tangent plane- angle of intersection of two spheres- condition for the orthogonality. (Book3: Chapter6:Sections 6.1, 6.2, 6.3, 6.4, 6.6, 6.7)	K4,K5	9
	CO1: Remember the Pole, polar for conics, diameters, conjugate diameters for ellipse.	K1	

Course Outcome	**CO2:** Understand the conjugate diameters for hyperbola.	K2
	CO3: Determine the polar equations of straight line and circle, equations of chord, tangent and normal and to find the asymptotes of hyperbola.	K3
	CO4: Analyze the system of Planes & Straight lines.	K4
	CO5: Evaluate the angle of intersection of two spheres.	K5

Learning Resources

Text Books	1. Vittal P.R. and Malini V, Algebra, Analytical Geometry and Trignometry, Margam Publications, India, 2018. 2. Manicavachagom Pillay T.K.and Natarajan T, A Text book of Analytical Geometry Part I-Two Dimensions, S.Viswananthan Printers Pvt. Ltd., 1996. 3. Shanti Narayan and Mittal P.K., Analytical Solid Geometry, S Chand Publishing, 2021.
Reference Books	1. S. L. Loney, Co-ordinate Geometry. 2. Robert J. T. Bell, Co-ordinate Geometry of Three Dimensions. 3. William F. Osgood and William C. Graustein, Plane and Solid Analytic Geometry, Macmillan Company, NewYork, 2016. 4. Calculus and Analytical Geometry, G.B. Thomas and R. L. Finny, Pearson Publication, 9th Edition, 2010. 5. Robert C. Yates, Analytic Geometry with Calculus, Prentice Hall, Inc., New York, 1961. 6. Earl W. Swokowski and Jeffery A. Cole, Algebra and Trigonometry with Analytic Geometry, Twelfth Edition, Brooks/Cole, Cengage Learning, CA, USA, 2010. 7. William H. McCrea, Analytical Geometry of Three Dimensions, Dover Publications, Inc, New York, 2006. 8. John F. Randelph, Calculus and Analytic Geometry, Wadsworth Publishing Company, CA, USA, 1969. 9. Ralph Palmer Agnew, Analytic Geometry and Calculus with Vectors, McGraw-Hill Book Company, Inc. New York, 1962.
Website Link	1. https://www.youtube.com/watch?v=cJ9XU7fi56c 2. https://www.youtube.com/watch?v=aSdaT62ndYE 3. https://www.youtube.com/watch?v=wtpwM2y86So

	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc-Mathematics Syllabus LOCF- CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**	
24M2UMAC03	ANALYTICAL GEOMETRY (TWO AND THREE DIMENSIONS)	DSC THEORY - III	II	4	4	-	-	4	

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	M	S	S	S	S	M	M
CO2	S	S	S	M	S	S	M	S	S	M
CO3	S	S	S	M	S	S	S	S	M	M
CO4	S	S	M	S	S	S	S	S	S	M
CO5	S	S	S	M	S	S	S	S	M	M

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	–
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	Assignment, Periodical assessment will be conducted and Followed the common pattern of Internal and External assessment suggested in the regulations.

Designed By	Verified By	Approved By
Mrs.P.SUBHA	Dr.K.LOGAARASI	Head CDC

MUTHAYAMMAL COLLEGE OF ARTS AND SCIENCE
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Rasipuram - 637 408

B.Sc-Mathematics Syllabus LOCF-CBCS with effect from 2024-2025 Onwards								
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**
24M2UMAS01	COMPUTATIONAL MATHEMATICS	SEC THEORY-I	II	2	2	-	-	2
Objective	Understand and use the structure of C++ programme, to solve different Numerical Methods.							

Unit	**Course Content**	**Knowledge Levels**	**Sessions**
I	Algebraic and Transcendental Equations: Bisection method-Method of false position-Newton-Raphson's method.	K1	5
II	System of Linear Algebraic Equations: Gauss elimination method – Gauss Jordan method – Gauss Jacobi method - Gauss Seidal method.	K2	5
III	C++ Program for Bisection method - C++ Program for Method of false position.	K2,K3	5
IV	C++ Program for Newton-Raphson's method - C++ Program for Gauss elimination method - C++ Program for Gauss Jordan method.	K4	5
V	C++ Program for Jacobi method - C++ Program for Gauss Seidal method.	K5	4
Course Outcome	**CO1:** Remember the roots of algebraic equations using different methods like, Method of false position, Newton-Raphson method	K1	
	CO2: Understand the system of algebraic equations using direct method.	K2	
	CO3: Solve C++ Program to compute roots of algebraic equations using Bisection method, Newton-Raphson method.	K3	
	CO4: Explain C++ Program to compute roots of algebraic equations Gauss Jordan method.	K4	
	CO5: Evaluate the C++ Program to solve the system of algebraic equations using the Jacobian method, Gauss Seidal method.	K5	

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(Autonomous)
Rasipuram - 637 408

Learning Resources				
Text Books	1. R.M. Somasundaram and R.M. Chandrasekaran, “Numerical Methods with C++ Programming”, Prentice Hall India Pvt. Ltd., New Delhi, 2005.			
Reference Books	1.Pallab Ghosh, “Numerical Methods with Computer Programs inC++”, Prentice Hall India Pvt. Ltd., New Delhi, 2009. 2.T. Veerarajan and T. Ramachandran, “Numerical Methods withPrograms in C”, Second Edition, McGraw Hill Education Pvt.Ltd, New Delhi, 2006.			
Website Link	1. https://youtu.be/PIPiv6gn_Ls 2. https://youtu.be/I41_Jd-7vn0 3. https://youtu.be/DWjjzeL_pKs			
	L-Lecture	T-Tutorial	P-Practical	C-Credit

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B.Sc-Mathematics Syllabus LOCF- CBCS with effect from 2024-2025 Onwards									
Course Code	**Course Title**	**Course Type**	**Sem.**	**Hours**	**L**	**T**	**P**	**C**	
24M2UMAS01	COMPUTATIONAL MATHEMATICS	SEC THEORY-I	II	2	2	-	-	2	

CO-PO Mapping

CO Number	P01	P02	P03	P04	P05	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	S	S	S	S	M	S	S	S	S	M
CO2	M	S	S	M	M	S	M	S	S	S
CO3	S	S	S	S	S	M	S	S	S	S
CO4	S	M	M	S	S	S	S	M	S	S
CO5	S	S	S	S	S	M	S	S	S	S

Level of Correlation between CO and PO	L-LOW	M-MEDIUM	S-STRONG

Tutorial Schedule	–
Teaching and Learning Methods	Lecture, Smart class presentation, Chalk and talk method.
Assessment Methods	Assignment, Periodical assessment will be conducted and Followed the common pattern of Internal and External assessment suggested in the regulations.

Designed By	Verified By	Approved By
Mrs.P.SUBHA	Dr.K.LOGAARASI	Head CDC