UNIVERSITY OF MADRAS

Chepauk, Chennai 600 005

[Est. 1857, State University, NAAC 'A' Grade, CGPA 3.32, NIRF 2019 Rank: 20]

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Undergraduate Programme in Mathematics

(With effect from the Academic Year 2020-21)

FEBRUARY 2020

Note: The Board of Studies is designed Learning Outcomes Based Curriculum Framework of B.Sc. Mathematics Programme prescribed by UGC

Content

1. 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.

2. PROGRAM LEARNING OUTCOMES

The comprehensive course outline enables the students to enhance Computational skills and Mathematical reasoning. The program develops the ability to think critically, logically and analytically thereby preparing the students to enhanced career opportunities in Industries, Commerce, Education and Research.

a. NATURE AND EXTENT OF BACHELOR'S DEGREE 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.

b. AIMS OF BACHELOR'S DEGREE PROGRAMME IN MATHEMATICS

The overall aim of B.Sc. 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.**

c. GRADUATE ATTRIBUTES IN MATHEMATICS

The graduate attributes in mathematics are mentioned in the expected course learning outcomes of each course which provides critical thinking, analytical reasoning, problem solving and research related skills etc,.

3. COURSE STRUCTURE

FIRST SEMESTER

Course Content	Name of the Course	Ins. Hrs	Credits	Int. Marks	Ext.Marks	Total
Part - I	Language Paper -I	4	3	25	75	100
Part - II	English Paper -I	4	3	25	75	100
Part - III	BMA-CSC01: Algebra@	5	4	25	75	100
	BMA-CSC02: Differential Calculus@	4	4	25	75	100
	Allied Paper- I	9	5	25	75	100
Part - IV	Basic Tamil/Adv. Tamil/NME –I*	2	2	25	75	100
	Soft Skills -I	2	3	50	50	100

SECOND SEMESTER

Course Content	Name of the Course	Ins. Hrs	Credits	Int. Marks	Ext.Marks	Total
Part - I	Language Paper -II	5	3	25	75	100
Part - II	English Paper -II	5	3	25	75	100
Part - III	BMA-CSC03: Trigonometry@	4	4	25	75	100
	BMA-CSC04: Integral Calculus and Vector Analysis@	5	4	25	75	100
	Allied Paper- II	9	5	25	75	100
Part - IV	Basic Tamil/Adv. Tamil/NME-II*	1	2	25	75	100
	Soft Skills -II	1	3	50	50	100

***NME: CHOOSE ANY ONE OF THE PAPER FROM THE OTHER DEPARTMENT**

THIRD SEMESTER

Course Content	Name of the Course	Ins. Hrs	Credits	Int. Marks	Ext. Marks	Total
Part - I	Language Paper -III	5	3	25	75	100
Part - II	English Paper -III	5	3	25	75	100
Part - III	BMA-CSC05: Analytical Geometry@	5	4	25	75	100
	BMA-CSC06: Differential Equations@	4	4	25	75	100
	Allied Paper- III	9	5	25	75	100
Part - IV	Environmental Studies	1	Examination will be held in the IV Sem.			
	Soft Skills -III	1	3	50	50	100

FOURTH SEMESTER

Course Content	Name of the Course	Ins. Hrs	Credits	Int. Marks	Ext.Marks	Total
Part - I	Language Paper -IV	5	3	25	75	100
Part - II	English Paper -IV	5	3	25	75	100
Part - III	BMA-CSC07: Transform Techniques@	4	4	25	75	100
	BMA-CSC08: Statics@	5	4	25	75	100
	Allied Paper- IV	9	5	25	75	100
Part - IV	Environmental Studies	1	2	25	75	100
	Soft Skills -IV	1	3	50	50	100

FIFTH SEMESTER

Course Content	Name of the Course	Ins. Hrs	Credits	Int. Marks	Ext.Marks	Total
Part - III	BMA-CSC09: Algebraic Structures-I@	6	4	25	75	100
	BMA-CSC10: Real Analysis-I@	6	4	25	75	100
	BMA-CSC11: Dynamics@	6	4	25	75	100
	BMA-CSC12: Discrete Mathematics@	6	4	25	75	100
	Elective Paper -I: Choose any one from Group-A	6	5	25	75	100
Part - IV	Value Education		2	25	75	100

SIXTH SEMESTER

Course Content	Name of the Course	Ins. Hrs	Credits	Int. Marks	Ext.Marks	Total
Part - III	BMA-CSC13: Algebraic Structures-II@	6	4	25	75	100
	BMA-CSC14: Real Analysis-II@	6	4	25	75	100
	BMA-CSC15: Complex Analysis@	6	4	25	75	100
	Elective Paper -II: Choose any one from Group-B	6	5	25	75	100
	Elective Paper -III: Choose any one from Group-B	6	5	25	75	100
Part - V	Extension Activity		1			

@ Common to B.Sc. Mathematics with Computer Applications.

LIST OF ALLIED SUBJECTS:

BPS-CSA01	Allied Physics – I (Theory)
BCY-CSA1A	Allied Chemistry – I (Theory)
BMA-CSA01	Calculus of finite differences and Numerical Analysis –I@
BMA-CSA02	Mathematical Statistics – I@
BMA-CSA08	Financial Accounting – I@
BPS-CSA02	Allied Physics – II (Theory) (pre-requisite Physics – I).
BPS-CSAP1	Allied Physics I & II (Practical)
BCY-CSA2A	Allied Chemistry – II (Theory) (pre-requisite Chemistry – I)
BCY-CSAP1	Allied Chemistry – I & II (Practical)
BMA-CSA03	Calculus of finite differences and Numerical Analysis -II (pre-requisite Calculus of finite differences and Numerical Analysis -I)@
BMA-CSA04	Mathematical Statistics II - (pre requisite Mathematical Statistics- I)@
BMA-CSAP1	Mathematical Statistics I & II (Practical) @
BMA-CSA08	Financial Accounting - II (prerequisite Financial Accounting - I)@

@ Common to B.Sc. Mathematics with Computer Applications.

LIST OF ELECTIVE SUBJECTS

GROUP – A

BMA-DSEA1	PROGRAMMING LANGUAGE 'C' WITH PRACTICALS
BMA-DSEA2	PROGRAMMING LANGUAGE PYTHON WITH PRACTICALS
BMA-DSEA3	MATHEMATICAL MODELING
BMA-DSEA4	NUMERICAL METHODS

GROUP - B

BMA-DSEB1	ELEMENTARY NUMBER THEORY
BMA-DSEB2	GRAPH THEORY
BMA-DSEB3	OPERATIONS RESEARCH
BMA-DSEB4	SPECIAL FUNCTIONS
BMA-DSEB5	APPLIED STATISTICS

The following distribution of marks for Computer related subjects which have both theory and practical (syllabus combined both theory and practical in each paper together) in B.Sc. Mathematics be followed:

PAPER	INTERNAL	EXTERNAL	TOTAL
Theory	25	75	100
Practical	40	60	100

Finally, theory marks (100) be reduced to 60% and practical marks (100) be reduced to 40%.

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