



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

137

GRADUATE ATTRIBUTES

1. **(KB) A knowledge base for Mathematics:** Demonstrated competence in university level Mathematics, fundamentals of Mathematic, and specialized Mathematics knowledge appropriate to the program.
2. **(PA) Problem analysis:** An ability to use appropriate knowledge and skills to identify, formulate, analyze, and solve Mathematical problems in order to reach substantiated conclusions
3. **(Inv.) Investigation:** An ability to conduct investigations of complex problems by methods that include appropriate analysis and interpretation of data and synthesis of information in order to reach valid conclusions.
4. **(Tools) Use of mathematical tools:** An ability to create, select, apply, adapt, and extend appropriate techniques, resources to a range of mathematical activities, from simple to complex, with an understanding of the associated limitations.
5. **(Team) Individual and teamwork:** An ability to work effectively as a member and leader in teams, preferably in a multi–disciplinary setting.
6. **(Comm.) Communication skills:** An ability to communicate mathematical concepts within the profession and with society at large. Such ability includes reading, writing, speaking and listening, and the ability to comprehend and write effective reports and documentation, and to give and effectively respond to clear instructions.
7. **(Prof.) Professionalism:** An understanding of the roles and responsibilities of the professional Mathematician in society, especially the primary role of protection of the public and the public interest.
8. **(Ethics) Ethics and equity:** An ability to apply professional ethics, accountability, and equity.
9. **(LL) Life–long learning:** An ability to identify and to address their own educational needs in a changing world in ways sufficient to maintain their competence and to allow them to contribute to the advancement of knowledge



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

138

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO 1	gain knowledge in foundational areas of mathematics.
PEO 2	communicate mathematics accurately, precisely and effectively.
PEO 3	develop mathematical thinking.
PEO 4	apply mathematical knowledge.
PEO 5	be able to solve mathematical problems using technology.

UNDERGRADUATE (UG) PROGRAMME OUTCOMES (POs)

Undergraduate (B.A., B.Sc., B.Com., B.C.A., B.B.A., etc.,) is a 3–year degree programme with 6 semesters consisting the following Programme Outcomes (POs) under various criteria including critical thinking, problem solving, effective communication, societal/ citizenship/ ethical credibility, sustainable growth and employable abilities.

PO 1	Critical Thinking: Intellectual exploration of knowledge towards actions in clear and rational manner by understanding the logical connections between ideas and decisions.
PO 2	Problem Solving: Understanding the task/ problem followed by planning and narrow execution strategy that effectively provides the solution.
PO 3	Effective Communication: Knowledge dissemination by oral and verbal mechanisms to the various components of our society.
PO 4	Societal/ Citizenship/ Ethical Credibility: Realization of various value systems/ moral dimensions and demonstrate the empathetic social concern as well as equity in all the decisions, executions and actions.
PO 5	Environmental Concern and Sustainable Growth: Understanding the emerging environmental challenges and provide the possible contribution in sustainable development that integrates environment, economy and employment.
PO 6	Skill Development and Employable Abilities: Adequate training in relevant skill sector and creating employable abilities among the under graduates.



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

139

PROGRAMME SPECIFIC OUTCOMES (PSOs)

On completion of **B.Sc. Mathematics** Programme, the students are expected to

PSO1	develop required skills such as arithmetical/analytical/computer programming skills etc., and provide a systematic understanding of the fundamental concepts and theories of mathematics.
PSO2	get expertise with skills to handle data, problems, to frame hypothesis, evaluate and validate results, and apply various concepts.
PSO3	gain advanced knowledge in the field of various applications of mathematics and apply knowledge of principles, concepts and results in specific subject area to analyse.
PSO4	develop the mathematical ability and abstract intelligence and to become good academician
PSO5	pursue higher studies which in turn will offer them job opportunities in various sectors like banks ,central government institutions etc.,



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

140

B.Sc. MATHEMATICS – II YEAR COURSE STRUCTURE – III SEMESTER

S. No.	Subject Code	Subject Title	Hrs./ Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UACT31	Part – I: Tamil – காப்பியமும் நாடகமும்	6	3	25	75	100	3
	21UACH31	Hindi – Hindi – III						
	21UACS31	Sanskrit – Sanskrit – III						
2.	21UACE31	Part – II: English – English For Enrichment – III	6	3	25	75	100	3
3.	21UMSC31	Part – III: Core – 5: Mechanics	5	3	25	75	100	5
4.	21UMSC32	Part – III: Core – 6: Numerical Analysis	5	3	25	75	100	5
5.	21UMSA31	Part – III: Allied – 3: Graph Theory And Laplace Transform	4	3	25	75	100	3
6.	21UMSSP1	Part – IV: SBS – 3: MS – Office – Lab	2	3	40	60	100	2
7.	21UMSN31	Part – IV: NME – 1: Fundamentals of Mathematics – I	2	3	25	75	100	2
TOTAL			30					23

COURSE STRUCTURE – IV SEMESTER

S. No.	Subject Code	Subject Title	Hrs./ Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UACT41	Part – I: Tamil – சங்க இலக்கியமும் அற இலக்கியமும்	6	3	25	75	100	3
	21UACH41	Hindi – Hindi – IV						
	21UACS41	Sanskrit – Sanskrit – IV						
2.	21UACE41	Part – II: English – English For Enrichment – IV	6	3	25	75	100	3
3.	21UMSC41	Part – III: Core – 7: Differential Equations	5	3	25	75	100	5
4.	21UMSC42	Part – III: Core – 8: Sequence And Series	5	3	25	75	100	5
5.	21UMSA41	Part – III: Allied – 4: Programming In C – Theory	4	3	25	75	100	3
6.	21UMSSP2	Part – III: SBS – 4: Programming In C – Lab	2	3	40	60	100	2
7.	21UMSN41	Part – IV: NME – 2: Fundamentals of Mathematics – II	2	3	25	75	100	2
8.		PART – V: Extension Activities	–	–	–	–	100	1
TOTAL			30					24



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

141

COURSE STRUCTURE – III SEMESTER

S. No.	Subject Code	Subject Title	Hrs./ Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UACT31	Part – I: Tamil – காப்பியமும் நாடகமும்	6	3	25	75	100	3
	21UACH31	Hindi – Hindi – III						
	21UACS31	Sanskrit – Sanskrit – III						
2.	21UACE31	Part – II: English – English For Enrichment – III	6	3	25	75	100	3
3.	21UMSC31	Part – III: Core – 5: Mechanics	5	3	25	75	100	5
4.	21UMSC32	Part – III: Core – 6: Numerical Analysis	5	3	25	75	100	5
5.	21UMSA31	Part – III: Allied – 3: Graph Theory And Laplace Transform	4	3	25	75	100	3
6.	21UMSSP1	Part – IV: SBS – 3: MS – Office – Lab	2	3	40	60	100	2
7.	21UMSN31	Part – IV: NME – 1: Fundamentals of Mathematics – I	2	3	25	75	100	2
		TOTAL	30					23

CA – Class Assessment (Internal)

SE – Summative Examination

SBS – Skill Based Subject

NME – Non –Major Elective

T – Theory

P – Practical



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

142

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UMSC31	MECHANICS	CORE – 5	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	III	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
------------------	---	--	---

COURSE DESCRIPTION:

This course is designed to learn various concepts of Mechanics

COURSE OBJECTIVES:

- To find the resultant and components of forces acting at a point.
- To learn about resolution of forces.
- To discuss about the resultant of two parallel forces.
- To explain about the path of a projectile.
- To discuss about simple harmonic motion.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO1	prove various law of forces.	Upto K3
CO2	prove theorems on resolved parts.	Upto K3
CO3	find the resultant of two like and unlike parallel forces and to define moment of a force.	Upto K3
CO4	explain about path of a projectile and solve various problems relating projectiles.	Upto K3
CO5	discuss simple harmonic motion.	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

143

MECHANICS

UNIT – I:

Forces acting at a point – Resultant and components – Parallelogram law of forces – Triangle law of forces – Converse of triangle law of forces – Lami's theorem.

UNIT – II:

Resolution of a force – Theorems of resolved parts – Resultant of any number of forces – condition of equilibrium.

UNIT – III:

Parallel forces – Resultant of two like and unlike parallel forces – Moment of a force – Varignon's theorem.

UNIT – IV:

Projectiles – Path of a projectile – Maximum height – time taken by a particle – time of flight – Horizontal range – simple problems.

UNIT – V:

Simple Harmonic motion – Equation of motion – composition of two SHM.

TEXT BOOK:

Statics and Dynamics by M. K. Venkatraman Agasthiyar.

STATICS

UNIT I – Chapter 2: sec 1 – 9 (page no 1 to 20)

UNIT II – Chapter 2: sec 11 – 16 (page no. 36 to 47)

UNIT III – Chapter 3: sec 1–13 (page no. 52 to 74)

DYNAMICS

UNIT IV – Chapter 6: sec 6.1 – 6.8 (page no. 139 to 151, 156 to 161)

UNIT V – Chapter 10: sec 10.1 to 10.7 (page no. 309 to 330)

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	2	1	2
CO2	2	2	2	1	1
CO3	2	2	2	2	1
CO4	2	2	1	1	1
CO5	2	2	1	2	1

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. G. R. SHYAMALA

Passed in the BOS Meeting held on 19/03/2022

Signature of the Chairman



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

144

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UMSC32	NUMERICAL ANALYSIS	CORE – 6	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	III	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
------------------	---	--	---

COURSE DESCRIPTION:

This course is designed to learn various methods of solving algebraic transcendental equations and various methods of solving numerical differentiation and numerical integration problems.

COURSE OBJECTIVES:

- To introduce various methods to solve algebraic, transcendental equation
- To introduce the concept of finite differences
- To discuss the concept of interpolation and its various method.
- To find maxima and minima of the given data using numerical differentiation.
- To study various method of numerical integration.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	solve algebraic ,transcendental and simultaneous equations using different method	Upto K3
CO2	find the missing data using the concept of finite differences and Gauss formula	Upto K3
CO3	solve problems using Gauss, Strilings, Bessels and Lagranges method	Upto K3
CO4	be familiar with the concept of numerical differentiation and finding maxima and minima of the problem	Upto K3
CO5	solve the numerical integration problem using different methods	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

145

NUMERICAL ANALYSIS

UNIT – I:

Numerical solutions of algebraic and transcendental equations – iteration method – Newton's Raphson method – method of false position – solutions of simultaneous linear equations– Gauss elimination method.

UNIT – II:

Gauss Jordan and Gauss Seidal method of solving simultaneous equations. Finite differences – forward difference and backward difference – finite difference properties – finding missing terms.

UNIT – III:

Interpolation– Newton's forward and backward formula – divided differences and properties – Newton's divided difference formula – Gauss formula – Stirlings formula – Bessel's formula – Lagranges formula– simple problems (problems only)

UNIT – IV:

Numerical differentiation= finding the first and second derivatives – maximum and minimum values of a function for a given data

UNIT – V:

Numerical integration = Newton's Cote's formula–Trapezoidal rule – Simpson's one-third rule= Simpson's three eight rule– Weedles rule (problems only)

TEXT BOOK:

Numerical Methods, Second edition, Scitech Publications (India) Pvt. Limited, by S. Arumugam, A. ThangapandiIssac , A. Somasundaram

UNIT I– Chapter: 3 (page 79 to 123, problems only)

UNIT II –Chapter: 3 (page 133 to 149), Chapter 6: (page 161 to 191) –problems only

UNIT III– Chapter:7 (page 215 to 234 and 240 to 243)–problems only

UNIT IV– Chapter: 8 (page 260 to 274) – problems only

UNIT V– Chapter:8 (page 279 to 293 and 297to 299) – problems only

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	1
CO2	2	3	2	3	1
CO3	2	3	3	3	1
CO4	2	2	3	3	1
CO5	2	2	3	2	1

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. E. B. BALARAMAN

Passed in the BOS Meeting held on 19/03/2022

Signature of the Chairman



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

146

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UMSA31	GRAPH THEORY AND LAPLACE TRANSFORM	ALLIED – 3	4	–	3

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	III	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
------------------	---	--	---

COURSE DESCRIPTION:

This course is designed to learn various concepts of Graph theory and Laplace transform

COURSE OBJECTIVES:

- To introduce Graphs
- To explain the concept of coverings and degrees.
- To discuss connectedness.
- To introduce Laplace transforms.
- To introduce Inverse Laplace transforms.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	give examples of various types of graphs.	Upto K3
CO2	prove theorems using concept of coverings and degree sequences.	Upto K3
CO3	define connectedness	Upto K3
CO4	find solutions of Laplace transformations problems by applying suitable results.	Upto K3
CO5	find solutions of Inverse Laplace transformations problems by applying suitable results.	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

147

GRAPH THEORY AND LAPLACE TRANSFORM

UNIT – I:

Introduction – Definition and examples – Degrees – sub graph – Isomorphism –Ramsay numbers.

UNIT – II:

Independent sets and coverings– Intersection graphs – line graphs – Matrices
Operations on graphs– Degree sequences – Graphic sequences.

UNIT – III:

Connectedness – Walks –Trails and paths – Connectedness and Components –Blocks – Connectivity.

UNIT – IV:

Laplace transforms

UNIT – V:

Inverse Laplace transforms

TEXT BOOKS:

1. *Invitation to Graph Theory* – Arumugam, Scitech publications (India)pvt.ltd.
2. *Differential equations and Laplace transformations* –Arumugam and Issac, New Gamma publishing House

TEXTBOOK 1:

UNIT I – chapter 1, 2 sec 1.0 – 1.3 sec 2.0 – 2.5(page no 1 to 17)

UNIT II – chapter 3 sec 2.6 – ,2.9, sec 3.0 – 3.3 (page no. 18 to 33)

UNIT III – chapter 4,sec 4.0– ,4.4 (page no. 33 to 47)

TEXTBOOK 2:

UNIT IV – chapter 3(page no. 3.1 to 3.13).

UNIT V – chapter 3 (page no. 3.14 to3.26)

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	2	3	1
CO2	2	3	2	3	1
CO3	2	3	3	3	1
CO4	2	2	3	3	1
CO5	2	2	3	2	1

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. M. K. ESWARLAL



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

148

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UMSSP1	MS – OFFICE LAB	SBS – 3	–	2	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	III	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
------------------	---	--	---

COURSE OBJECTIVE:

The students will learn how to use various applications in Microsoft Office and to use screen capturing software

MS – OFFICE LAB

LIST OF PROGRAMS:

1. Design a document with at least two pages using MS word with different font style, different font sizes, header and footer with page number.
2. Design an invitation with two column breaks, use word to insert picture, design border and shading.
3. Create a daily attendance sheet of a class room for a week with heading, day, period etc.,
4. Create a main document and database of addresses and merge them using Mail–merge tools.
5. Create a yearly salary report in Excel worksheet. Use auto fill to enter the month and to sum the column and row total, to calculate DA and others, to insert data and time function in the footer.
6. Create student mark list for three subject and to list the result and rank by using string and logical functions.
7. Create yearly budget of a company and create different types of charts for the data.
8. Determine the solution of a quadratic equation and find the addition subtraction and multiplication of two matrices.
9. Create a slide show using blank representation with at least 10 slides.
10. Creating a data base (student marks) and queries.

COURSE DESIGNER: Dr. V. RAMAMANI

Passed in the BOS Meeting held on 19/03/2022

Signature of the Chairman



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

149

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UMSN31	FUNDAMENTALS OF MATHEMATICS – I	NME – 1	2	–	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	III	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
------------------	---	--	---

COURSE DESCRIPTION:

The Paper Fundamentals of Mathematics is designed for the students who need to improve or review basic math skills and concepts.

COURSE OBJECTIVE:

To enable the students to acquire the basic knowledge in Matrices, Calculus and Set theory concepts.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcome	Knowledge Level (According to Bloom's Taxonomy)
CO 1	apply the basic properties and enable to solve the problem	Upto K3
CO 2	apply the formula and understand the methods of solving the problem	Upto K3
CO 3	use definitions and properties of solving the problems	Upto K3
CO 4	use basic set theory definitions and enable to solve the problems	Upto K3
CO 5	apply the formula and forming the quadratic equations and find its solutions	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

150

FUNDAMENTALS OF MATHEMATICS – I

UNIT – I:

Theory of indices and Surds.

UNIT – II:

Differential Calculus (Simple problems only)

UNIT – III:

Theory of Matrices.

UNIT – IV:

Theory of Sets.

UNIT – V:

Quadratic Equations–Forming the quadratic equation whose roots are given.

TEXT BOOKS:

1. *Business Mathematics* by Dr. M. Manoharan Dr. K. Elango and Prof K. L. Eswaran
2. *Introduction to Business Mathematics* by Prof Sundaresan and Jeyaselan , Sultan Chand publications.

UNIT – I TEXT BOOK – 1 CHAPTER–2 [Page 54 to 65]

UNIT –II TEXT BOOK – 1 CHAPTER–5 [Page 192 to 204]

UNIT – III TEXT BOOK – 1 CHAPTER–8 [Page 329 to 373]

UNIT –IV TEXT BOOK – 1 CHAPTER–1 [Page 8 to 40]

UNIT – V TEXT BOOK – 2 CHAPTER –XI

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	3	2
CO2	1	2	2	2	2
CO3	2	2	3	2	2
CO4	2	2	3	2	2
CO5	2	2	2	3	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. K. N. GANESH BABU



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

151

COURSE STRUCTURE – IV SEMESTER

S. No.	Subject Code	Subject Title	Hrs./ Week	Exam (Hrs.)	CA	SE	Total Marks	Credits
1.	21UACT41	Part – I: Tamil – சங்க இலக்கியமும் அற இலக்கியமும்	6	3	25	75	100	3
	21UACH41	Hindi – Hindi – IV						
	21UACS41	Sanskrit – Sanskrit – IV						
2.	21UACE41	Part – II: English – English For Enrichment – IV	6	3	25	75	100	3
3.	21UMSC41	Part – III: Core – 7: Differential Equations	5	3	25	75	100	5
4.	21UMSC42	Part – III: Core – 8: Sequence And Series	5	3	25	75	100	5
5.	21UMSA41	Part – III: Allied – 4: Programming In C – Theory	4	3	25	75	100	3
6.	21UMSSP2	Part – III: SBS – 4: Programming In C – Lab	2	3	40	60	100	2
7.	21UMSN41	Part – IV: NME – 2: Fundamentals of Mathematics – II	2	3	25	75	100	2
8.		PART – V: Extension Activities	–	–	–	–	100	1
		TOTAL	30					24

CA – Class Assessment (Internal)

SE – Summative Examination

SBS – Skill Based Subject

NME – Non –Major Elective

T – Theory

P – Practical



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

152

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UMSC41	DIFFERENTIAL EQUATIONS	CORE – 7	5	-	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	IV	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
------------------	---	--	---

COURSE DESCRIPTION:

This course is designed to learn various types of differential equations and solve the differential equations.

COURSE OBJECTIVE:

To enable the students to understand the concepts of Exact equations, Linear equations with constant coefficients, Partial Differential Equations, Standard forms and to gain knowledge about Simultaneous linear differential equations, Linear equations of the second order, Derivation of Partial Differential Equations, Lagrange method of solving linear equations and to apply the knowledge gained in solving problems

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	understand the concept of exact differential equations , Equations solvable for p, y, x, Clairaut's form	Upto K3
CO 2	gain knowledge about linear equations with constant coefficients and variable coefficients	Upto K3
CO 3	understand simultaneous differential equations and linear equations of the second order	Upto K3
CO 4	understand derivation of partial differential equations and Lagrange's method of solving linear equations.	Upto K3
CO 5	gain knowledge about standard forms – up to Clairaut's form.	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

153

DIFFERENTIAL EQUATIONS

UNIT – I:

Exact differential equations of – Equations solvable for p – Equations solvable for y – Equations solvable for x – Clairaut's form.

UNIT – II:

Linear Equations with constant coefficients – Linear equations with variable coefficients.

UNIT – III:

Equations reducible to linear equations – Simultaneous differential equations – Simultaneous linear differential equations – Linear equations of the second order.

UNIT – IV:

Partial differential equations of the first order – Derivation of partial differential equations – Lagrange's method of solving linear equations.

UNIT – V:

Special methods – Standard forms – Standard form I $F(p,q)=0$ – Standard form II $F(x,p,q)=0$ – Standard form III $f(x,p)=g(y,q)$ – Standard form IV Clairaut's form $z=px+qy+f(p,q)$.

TEXT BOOK: *Differential Equations and its Applications* by TKM Pillai and S.Narayanan.

REFERENCE BOOK: *Differential Equations and its Applications* by S.Arumugam, A. Thangapandi Issac and A. Somasundaram.

UNIT I	Chapter II – Page 20– 28, Chapter IV – Page 60– 67
UNIT II	Chapter V – Page 68– 96
UNIT III	Chapter V – Page 97 – 101 Chapter VI – Page 119 – 129 Chapter VIII – Page 145 – 148(Example problems 1 and 2 only)
UNIT IV	Chapter XII – Page 219 – 229
UNIT V	Chapter XII – Page 232 – 238

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	1	3	3	2	
CO2	2	2	1	2	2	
CO3	3	2	2	3	3	
CO4	2	2	1	1	1	
CO5	2	2	1	3	2	

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. C. K. SIVAKUMAR

Passed in the BOS Meeting held on 19/03/2022

Signature of the Chairman



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

154

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UMSC42	SEQUENCE AND SERIES	CORE – 8	5	–	5

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	IV	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
------------------	---	--	---

COURSE DESCRIPTION:

This course is designed to learn various concepts of Sequences and series

COURSE OBJECTIVES:

- To define sequences
- To express the behavior of sequences.
- To explain sub sequences.
- To discuss various test.
- To identify different series

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	solve problems based on sequences	Upto K3
CO2	prove theorems using concept of algebra of limits	Upto K3
CO3	define sub sequences and Cauchy sequences	Upto K3
CO4	find solution for problem by applying suitable test.	Upto K3
CO5	test the convergence of series	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

155

SEQUENCE AND SERIES

UNIT – I:

Introduction – Sequences– Bounded Sequences–Monotonic Sequences–Convergent sequences – Divergent and Oscillating sequences.

UNIT – II:

Algebra of limits – Behaviour of Monotonic sequences

UNIT – III:

Some theorems on limits – Sub sequences– Cauchy sequences

UNIT – IV:

Series of positive terms– comparison test– Kummers test

UNIT – V:

Root test and condensation test –Alternating series–Absolute convergence.

TEXT BOOK:

Sequences and series – Arumugam and Issac, New Gamma publishing House.

UNIT I – sec 3.1 to 3.5 (page no 39 to 51)

UNIT II – sec 3.6 – 3.7 (page no. 56 to 82)

UNIT III – sec 3.8– 3.11 (page no. 82 to 103)

UNIT IV – sec 4.1– 4.3(page no. 112 to 144).

UNIT V – sec 4.4, 5.1 – 5.2 (page no. 145 to151) (page no. 157 to 166)

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	3	3	2
CO2	3	3	2	3	2
CO3	3	3	2	3	2
CO4	3	3	3	2	2
CO5	2	2	2	2	2

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Prof. M. K. ESWARLAL



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

156

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UMSA41	PROGRAMMING IN C – THEORY	ALLIED – 4	4	–	3

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	IV	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
------------------	---	--	---

COURSE DESCRIPTION:

This course is designed to learn various concepts of Programming in C

COURSE OBJECTIVES:

- To introduce data types and expressions
- To explain i/o operators and the concept of branching.
- To explain looping statements and arrays.
- To discuss the concepts of strings and functions.
- To discuss the recursion and structures
- To identify different series

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO1	know the data types and syntax of operators and expressions.	Upto K3
CO2	write simple programmes using branching and i/o statements	Upto K3
CO3	write the programmes using looping and arrays	Upto K3
CO4	know the concepts of strings and functions.	Upto K3
CO5	know the concepts of structures	Upto K3

K1– KNOWLEDGE (REMEMBERING), K2–UNDERSTANDING, K3–APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

157

PROGRAMMING IN C

UNIT – I:

Constants, Variables and data types – operators and expression.

UNIT – II:

Managing input and output operators, decision making and branching.

UNIT – III:

Decision making and looping – arrays.

UNIT – IV:

Handling of character strings – user defined functions.

UNIT – V:

Recursion – Structures.

TEXT BOOK:

Programming in ANSI C (2nd Edition) by E. Balagurusamy.

UNIT I – Chapter 2: (Sec 2.2 to 2.10) Chapter 3: (Sec 3.1 to 3.12, 3.14 to 3.16)

UNIT II – Chapter 4: (Sec 4.2 to 4.5) Chapter 5: (Sec 5.2 to 5.7, 5.9)

UNIT III – Chapter 6: (Sec 6.2 to 6.5) Chapter 7: (Sec 7.1 to 7.5)

UNIT IV – Chapters 8: (Sec 8.2 to 8.5, 8.7, 8.8) Chapter 9 : (Sec 9.2 to 9.10)

UNIT V – Chapter 9: (Sec 9.13) Chapter 10: (Sec 10.2to 10.9)

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	1	3	3	1
CO2	3	3	2	3	2
CO3	3	3	2	3	3
CO4	3	3	3	2	3
CO5	1	2	2	2	2

3. Advanced Application

2. Intermediate Development

1. Introductory Level

COURSE DESIGNER: Prof. T. R. DINAKARAN



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

158

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UMSSP2	PROGRAMMING IN C – LAB	SBS – 4	–	2	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	IV	40	60	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
------------------	---	--	---

COURSE OBJECTIVE:

The students will learn how to solve the problems using the applications of C language

PROGRAMMING IN C – LAB

LIST OF PROGRAMS:

1. Write a program to find the simple interest.
2. Write a program to find the compound interest.
3. Write a program to find the biggest number.
4. Write a program to convert the temperature from Celsius to Fahrenheit.
5. Write a program to convert the temperature from Fahrenheit to Celsius.
6. Write a program to solve the quadratic equation.
7. Write a program for salesman's salary.
8. Write a program for Pay bill calculation.
9. Write a program for multiplication table.
10. Write a program to find the 10 x 10 binomial coefficients.
11. Write a program to arrange the numbers in ascending order.
12. Write a program to find the mean and standard deviation.
13. Write a program to find the median.
14. Write a program to find the matrix multiplication.
15. Write a program to find the popularity of cars

COURSE DESIGNER: Prof. T. R. DINAKARAN



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

159

COURSE CODE	COURSE TITLE	CATEGORY	T	P	CREDITS
21UMSN41	FUNDAMENTALS OF MATHEMATICS – II	NME – 2	2	–	2

YEAR	SEMESTER	INTERNAL	EXTERNAL	TOTAL
II	IV	25	75	100

NATURE OF COURSE	Employability <input checked="" type="checkbox"/>	Skill Oriented <input checked="" type="checkbox"/>	Entrepreneurship <input type="checkbox"/>
------------------	---	--	---

COURSE DESCRIPTION:

This course is designed to acquire the knowledge of mathematics for competitive examinations.

COURSE OBJECTIVES:

- To understand the relationship between L.C.M and H.C.F.
- To get the knowledge about mathematical relations among numbers.
- To understand the concept of ratio and proportion.
- To acquire knowledge to solve Transportation problems.
- To know how to minimize the cost in Assignment problems.

COURSE OUTCOMES (COs):

After the completion of the course, the students will be able to

No.	Course Outcomes	Knowledge Level (According to Bloom's Taxonomy)
CO 1	solve problems involving HCF & LCM and their relationships	Upto K3
CO 2	find solutions for problems on numbers	Upto K3
CO 3	determine means and extremes, distinguish between ratio & proportion	Upto K3
CO 4	compute the IBFS of a transportation problem using various methods	Upto K3
CO 5	find the optimal solution by Hungarian method	Upto K3

K1- KNOWLEDGE (REMEMBERING), K2-UNDERSTANDING, K3-APPLY



SOURASHTRA COLLEGE, MADURAI – 625004

(An Autonomous Institution Re-accredited with 'B+' grade by NAAC)

B.Sc. MATHEMATICS – SYLLABUS

(Under CBCS based on OBE) (with effect from 2021 – 2022)

160

FUNDAMENTALS OF MATHEMATICS – II

UNIT – I:

H.C.F and L.C.M of numbers (examples only)

UNIT – II:

Problems on numbers (examples only)

UNIT – III:

Ratio and Proportion (examples only)

UNIT – IV:

Transportation problems –Find IBFS using North west Corner method and least cost method only (Simple problems only)

UNIT – V:

Assignment problems (minimization case only)

TEXT BOOKS:

1. *Quantitative Aptitude* by R. S. Agarwal, S. Chand & Co, Publications, Reprint 2009. (Unit 1, 2 &3)
2. *Linear Programming* by S. Arumugam & Issac, New Gamma Publications. (Unit 4&5)

DIGITAL TOOLS:

https://youtu.be/G_TgipUX21k

<https://youtu.be/LGV6HeZubnk>

Mapping of CO with PSO

	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	1	2			
CO2	3	2	1		2
CO3	3	1	1		2
CO4	1	3	2	1	2
CO5	1	3	2	1	1

3. Advanced Application 2. Intermediate Development 1. Introductory Level

COURSE DESIGNER: Dr. S. K. KANCHANA