

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)

Nationally Accredited with 'A+' Grade by NAAC

**PG AND RESEARCH DEPARTMENT OF
MATHEMATICS**



**B.Sc., MATHEMATICS
AUTONOMOUS SYLLABUS
(2025-2026 and ONWARDS)**

CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MATHEMATICS

VISION

To strive for excellence in the mathematical sciences in addition to encourage people to undertake opportunities in transdisciplinary domains.

MISSION

- To enhance analytical and logical problem-solving capabilities.
- To provide excellent mathematical science knowledge for a suitable career and to groom students for national prominence.
- To teach students how to use data analytics.
- To prepare students for transdisciplinary research and applications.
- Value-based education and service-oriented training programmes are used to acquire life skills.

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEOs	Statements
PEO1	LEARNING ENVIRONMENT To facilitate value-based holistic and comprehensive learning by integrating innovative learning practices to match the highest quality standards and train the students to be effective leaders in their chosen fields.
PEO2	ACADEMIC EXCELLENCE To provide a conducive environment to unleash their hidden talents and to nurture the spirit of critical thinking and encourage them to achieve their goal.
PEO3	EMPLOYABILITY To equip students with the required skills in order to adapt to the changing global scenario and gain access to versatile career opportunities in multidisciplinary domains.
PEO4	PROFESSIONAL ETHICS AND SOCIAL RESPONSIBILITY To develop a sense of social responsibility by formulating ethics and equity to transform students into committed professionals with a strong attitude towards the development of the nation.
PEO5	GREEN SUSTAINABILITY To understand the impact of professional solutions in societal and environmental contexts and demonstrate the knowledge for an overall sustainable development.

PROGRAMME OUTCOMES FOR B.Sc Mathematics, B.Sc Physics,
B.Sc Chemistry PROGRAMME

After completing a B.Sc., programme, a learner will be able to

PO NO.	On completion of B.Sc Mathematics / B.Sc Physics / B.Sc Chemistry Programme, the students will be able to
PO1	DOMAIN KNOWLEDGE Analyse, design and develop solutions by applying from fundamental concepts of basic sciences and expertise in discipline.
PO2	PROBLEM SOLVING Ability to think abstractly, to evaluate and concentrates effectively on problem-solving, as well as knowledge of global challenges.
PO3	CREATIVE THINKING AND TEAM WORK Develop prudent decision-making skills and mobility to work in teams to solve multifaceted problems.
PO4	EMPLOYABILITY Self-study acclimatize them to observe effective interactive practices for practical learning enabling them to be a successful science graduate.
PO5	LIFE LONG LEARNING Assure consistent improvement in the performance and arouse interest to pursue higher studies in premium institutions.

PROGRAMME SPECIFIC OUTCOMES FOR B.Sc
MATHEMATICS

PSO NO.	The Students of B.Sc Mathematics will be able to	POs Addressed
PSO1	Procure a precise understanding of the mathematical concepts.	PO1, PO3
PSO2	Excel by enhancing interpersonal skills, overcoming procedural challenges and intending career paths.	PO3, PO4
PSO3	Recognize, strengthen and analyse mathematical problems in order to acquire better conclusion.	PO4, PO5
PSO4	Manipulate numerical abilities across a variety of domains.	PO2, PO5
PSO5	Develop and desire to learn more about advanced mathematics and its applications.	PO5



CAUVERY COLLEGE FOR WOMEN (AUTONOMOUS)
PG AND RESEARCH DEPARTMENT OF MATHEMATICS
B.Sc MATHEMATICS PROGRAMME STRUCTURE
LEARNING OUTCOME BASED CURRICULUM FRAMEWORK (CBCS-LOCF)
 (For the candidates admitted from the Academic year 2025-2026 Onwards)

Semester	Part	Course	Course Title`	Course Code	Inst. Hrs. / week	Credits	Exam			Total
							Hrs.	Marks		
								Int	Ext	
I	I	Language Course – I (LC)	தமிழ் இலக்கிய வரலாறு- I	25ULT1	6	3	3	25	75	100
			Hindi Ka Samanya Gyan Aur Nibandh	23ULH1						
			Poetry, Grammar and History of Sanskrit Literature	23ULS1						
			Foundation Course: Paper I- French I	23ULF1						
	II	English Language Course – I (ELC)	General English-I	23UE1	6	3	3	25	75	100
	III	Core Course – I (CC)	Algebra and Trigonometry	23UMA1CC1	4	4	3	25	75	100
		Core Course – II (CC)	Differential Calculus	23UMA1CC2	5	4	3	25	75	100
		First Allied Course – I (AC)	Mathematical Statistics	23UMA1AC1	5	4	3	25	75	100
		First Allied Course – II (AP)	Programming Language using MATLAB (P)	23UMA1AC2P	2	2	3	40	60	100
	IV	Ability Enhancement Compulsory Course – I (AECC)	UGC Jeevan Kaushal Universal Human Values	25UGVE	2	2	-	100	-	100
	Total				30	22				700
	Extra Credit Course		SWAYAM		As per UGC Recommendation					

Note:

Part – I-Language – Tamil/Hindi/French/Sanskrit

Part – II- English

List of Allied Courses:

Allied Course I- Mathematical Statistics

Allied Course II- Computer Science

Part	Course	No. of Courses	Hours/ Course	Credits	Total Credits
I	Tamil/ Other Language	4	6	12	12
II	English	4	6	12	12
III	Core (Theory)	13	4/5	13*4=52	98
	Core (Theory)	2	6	2*5=10	
	Core Practical	1	2	1*2=2	
	Cyber Security	1	5	1*4=4	
	Project Work	1	4	4	
	Internship	1	-	2	
	First Allied	3	5/4/3		
	Second Allied	3	5/4/3	3*3=9	
IV	DSE	2	5	2*3=6	17
	GEC	2	2	2*2=4	
	SEC	2	2	2*2=4	
	AECC-I -Universal Human Values	1	2	2	
	AECC-II-Environmental Studies	1	2	2	
	AECC-III-Innovation and Entrepreneurship	1	2	1	
	AECC-IV-Health and Wellness	1	-	1	
	AECC-V- Professional Skills	1	2	2	
V	AECC-VI- Gender Studies	1	1	1	01
	Extension Activities	0		1	
		45		140	140

The Internal and External marks for Theory and practical papers are as follows:

Subject	Internal Marks	External Marks
Theory	25	75
Practical	40	60

FOR THEORY:

The passing minimum for CIA shall be 40% out of 25 marks [i.e. 10 marks].

The passing minimum for University Examinations shall be 40% out of 75 marks [i.e. 30 marks].

FOR PRACTICAL:

The passing minimum for CIA shall be 40% out of 40 marks [i.e. 16 marks].

The passing minimum for University Examinations shall be 40% out of 60 marks [i.e. 24 marks].

I SEMESTER

CORE COURSE – I (CC)
ALGEBRA AND TRIGONOMETRY
(2023-2024 Onwards)

Semester I	Internal Marks: 25 Marks:75		External	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
23UMA1CC1	ALGEBRA AND TRIGONOMETRY	CORE	4	4

Course Objective

- Basic ideas on the Theory of Equations, Matrices and Number Theory.
- Knowledge to find expansions of trigonometry functions, solve theoretical and applied problems.
- Understanding of how Hyperbolic functions can be used as a powerful tool in solving problems in science.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define and interpret on reciprocal equations	K1, K2
CO2	Illustrate the sum of binomial, exponential and logarithmic series	K3
CO3	Compute Eigen values, eigen vectors, verify Cayley – Hamilton theorem and diagonalize a given matrix.	K3
CO4	Determine 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

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	2	3	2	3	3	3	2	2
CO2	3	3	3	2	2	3	2	2	2	2
CO3	3	3	3	3	3	3	2	2	2	2
CO4	3	2	3	3	2	3	3	3	2	2
CO5	2	2	3	2	2	3	3	2	2	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –

“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Reciprocal Equations - Standard form - To increase or decrease the roots of a given equation by a given quantity- Removal of terms- Horner's method – related problems.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
II	Binomial Series– The following are the deductions from the Binomial Series - Approximations using Binomial Series- The Exponential Series – The Logarithmic series- related problems.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
III	Inverse matrix -Characteristic equation – Eigen values and Eigen Vectors-Similar matrices - Cayley – Hamilton Theorem (Statement only) - Finding powers of square matrix, Inverse of a square matrix up to order 3, Diagonalization of square matrices - related problems.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
IV	Expansions of $\cos n\theta$ and $\sin n\theta$ - Expansion of $\tan n\theta$ in powers of $\tan \theta$ - Expansion of $\tan (A+B+C+...)$ - Powers of sines and cosines of θ in terms of functions of multiples of θ , Expansions of $\cos^n \theta$, $\sin^n \theta$, $\sin^n \theta \cos^n \theta$ when n is a positive integer - Expansions of $\sin \theta$ and $\cos \theta$ in a series of ascending powers of θ - related problems.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
V	Hyperbolic functions – Relation between circular and hyperbolic functions - Inverse hyperbolic functions - Logarithm of complex quantities - related problems.	12	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5
VI	Self Study for Enrichment: (Not included for End Semester Examination) Symmetric function of the roots - Partial Fractions- Rank of a matrix - To resolve into factors the expression $x^n - a^n, x^n + a^n$ - Summation of trigonometric series.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4, K5

Text Books

1. Manicavachagom Pillay, T.K, Natarajan T, Ganapathy K S (2018). *Algebra, Volume I*. S.Viswanathan (Printers &Publishers), Pvt. Ltd.
2. Sudha S (1998). *Algebra, Analytical Geometry(2D) and Trigonometry*. Emerald Publishers.

3. Manicavachagom Pillay, T.K, Natarajan T, Ganapathy K S (2015). *Algebra, Volume II*. S.Viswanathan (Printers &Publishers), Pvt. Ltd.
4. Narayanan, S, Manicavachagom Pillay, T.K (2013). *Trigonometry*. S.Viswanathan (Printers &Publishers), Pvt. Ltd.

Chapters and Sections

UNIT-I	Chapter VI: Sections 16-17,19, 30 [1]
UNIT-II	Chapter I: Sections 1.1-1.5 [2]
UNIT-III	Chapter II: Sections 8, 16 [3]
UNIT- IV	Chapter III: Sections 1-5 [4]
UNIT- V	Chapter IV: Fully [4] Chapter V : Section 5 [4]

Reference Books

1. David C. Lay, *Linear Algebra and its Applications*, 3rd Ed., Pearson Education Asia, Indian Reprint, 2020.
2. Frank Ayres JR, *Theory and Problems of Plane and Spherical Trigonometry*, Schaum's Outline Series McGraw-Hill Book Company, 1954.
3. Vittal P.R, Malini V, *Algebra, Analytical Geometry and Trigonometry*, Margham Publications, 2010.

Web References

1. <https://www.youtube.com/watch?v=0HwGGTdrBzg>
2. <https://www.youtube.com/watch?v=BydVprh9NgQ>
3. <https://www.youtube.com/watch?v=r-b4m2-vCt0>
4. <https://www.youtube.com/watch?v=IcBXhQNx4fY>
5. <https://www.youtube.com/watch?v=ZjBcmEeUWXg>

Pedagogy

Power point presentations, Group Discussions, Seminar, Quiz, Assignment.

Course Designer

Dr. R.Divya

CORE COURSE – II (CC) DIFFERENTIAL CALCULUS

(2023-2024 Onwards)

Semester I	Internal Marks: 25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
23UMA1CC2	DIFFERENTIAL CALCULUS	CORE	5	4

Course Objective

- **Explore** the basic skills of the students with mathematical methods formatted for their major concepts and train them in basic Differentiation.
- **Analyze** mathematical statements and expressions.
- **Evaluate** the fundamental concepts of differentiation, successive differentiation, and their applications.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain the concepts of Calculus.	K1, K2
CO2	Classify the problem models in the respective area.	K3
CO3	Solve various types of problems in the corresponding stream.	K3
CO4	Identify the properties of solutions in the core area.	K3
CO5	Discover the applications of Calculus.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	2	2
CO2	3	2	3	3	3	3	3	3	2	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	2	3	3	2	3	3	2	2	3
CO5	3	2	3	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
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 – A complete formal proof by induction.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Partial Differentiation: Partial derivatives – Successive partial derivatives – Function of a function rule – Total differential coefficient – A special case – Implicit Functions.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
III	Partial Differentiation (Continued): Homogeneous functions – Partial derivatives of a function of two functions – Maxima and Minima of functions of two variables – Lagrange's method of undetermined multipliers.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Envelope: Method of finding the envelope – Another definition of envelope – Envelope of family of curves which are quadratic in the parameter – Family of curves will contain two parameters and the two parameters are connected by a relation.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
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 Involute – Radius of Curvature when the curve is given in Polar Co-ordinates	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment: (Not included for End Semester Examination) Meaning of Derivative : Geometrical interpretation– Feynman's method of differentiation – Taylor's expansion of $f(x,y)$ – p-r equation : pedal equation of a curve.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Book

1. Narayanan.S Manicavachagom Pillay.T.K. (2019). *Calculus Volume-I*. Ananda Book Depot.

Chapters and Sections

UNIT-I	Chapter III	Sections 1.1-1.6, 2.1,2.2
UNIT-II	Chapter VIII	Sections 1.1-1.5
UNIT-III	Chapter VIII	Sections 1.6 ,1.7,4,5
UNIT-IV	Chapter X	Sections 1.1-1.4
UNIT-V	Chapter X	Sections 2.1-2.6

Reference Books

1. Rawat.K.S.(2006). *An Differential Calculus*.1st Edition, Daryaganj, Newdelhi-2:AdhyayanPulishers and distributors, j m d House,Murarlal stre.
2. Arumugam. S and Issac. (2014). *Calculus*. New Gamma Publishing House.
3. Bali. N.P. (2010). *Differential Calculus*. Laxmi Publications (P) Ltd. New Delhi.

Web References

1. <https://www.youtube.com/watch?v=s8hVridQ5IA>
2. <https://freevideolectures.com/course/4224/npTEL-integral-vector-calculus/34>
3. <https://www.youtube.com/watch?v=IQJ0UiM91Z4>
4. <https://www.youtube.com/watch?v=AXqhWeUEtQU>
5. <https://www.youtube.com/watch?v=j5VGo1n8KBY&list=PLpklqhIbn1jrIbgS6UckW39WE04bAFjOS>
6. <https://archive.nptel.ac.in/courses/111/104/111104095/>

Pedagogy

Chalk and Talk, Power point presentation, Group Discussion, Seminar, Assignment and Quiz.

Course Designer

Dr.L.Mahalakshmi

FIRST ALLIED COURSE –I (AC)
MATHEMATICAL STATISTICS
(2023-2024 Onwards)

Semester I	Internal Marks:25		External Marks:75	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs/Week	CREDITS
23UMA1AC1	MATHEMATICAL STATISTICS	ALLIED	5	4

Course Objectives

- **Enable** in-depth knowledge of probability.
- **Explore** the concepts of some statistical data.
- **Analyse** the properties of discrete and continuous distributions.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Define the basic concepts in probability, some special distributions, and sampling distributions.	K1
CO2	Explain the properties of probability and the theory of sampling distributions to find solutions of real-life problems.	K2
CO3	Solve problems in probability, some special distributions and sampling distributions.	K3
CO4	Examine the given data and interpret the results	K4
CO5	Analyze probability, and various distributions in the case of solid conclusions about the values of the population parameter.	K4

Mapping of CO with PO and PSO

Cos	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	3	3	2	2	2
CO2	3	2	3	3	3	3	3	3	2	3
CO3	3	3	2	3	3	3	3	3	3	3
CO4	3	2	3	3	2	3	3	2	2	3
CO5	3	2	3	3	2	3	3	3	3	2

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Syllabus

UNIT	CONTENT	HOURS	COs	COGNITIVE LEVEL
I	Theory of Probability: Introduction – Short History – Definitions of Various Terms – Mathematical or Classical or ‘a Priori’ Probability –Statistical or Empirical Probability –Mathematical Tools: Preliminary Notion of sets–Sets and Elements of Sets – Operations on Sets –Algebra of Sets–Axiomatic approach to Probability–Random Experiment (Sample Space) – Event–Some Illustrations–Algebra of Events–Probability: Mathematical Notion – Probability Function – Laws of Addition of Probabilities–Extension of General Law of Addition of Probabilities– Law of Multiplication or Theorem of Compound Probability–Independent Events–Pair wise Independent Events–Mutually Independent Events– Baye’s theorem.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
II	Random Variables and Distribution Functions: Random Variable–Distribution Functions – Properties of Distribution Function–Discrete Random Variable –Probability Mass Function – Discrete Distribution Function– Continuous Random Variable –Probability Density Function–Various Measures of Central Tendency, Dispersion, Skewness and Kurtosis for Continuous Probability Distribution – Continuous Distribution Function – Joint Probability Mass Function and Marginal and Conditional Probability Function–Joint Probability Distribution Function–Joint Density Function, Marginal Density Function –The Conditional Distribution Function and Conditional Probability Density Function.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

III	Mathematical Expectation Mathematical Expectation – Addition Theorem of Expectation – Multiplication Theorem of Expectation – Co-variance – Expectation of a Linear Combination of Random Variables – Variance of a Linear Combination of Random Variables – Expectation of a Continuous random variable – Conditional Expectation & Conditional Variance.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
IV	Special Discrete Probability Distributions: Introduction – Discrete uniform Distribution – Bernoulli Distribution: Moments of Bernoulli Distribution-Binomial Distribution: Moments of Binomial Distribution –Recurrence Relation for the Moments of Binomial Distribution – Factorial Moments of Binomial Distribution–Mean Deviation about Mean of Binomial Distribution–Mode of Binomial Distribution –Moment Generating Function of Binomial Distribution – Additive Property of Binomial Distribution.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
V	Special Continuous Probability Distributions: Introduction – Normal Distribution: Normal Distribution as a Limiting Form of Binomial Distribution–Chief Characteristics of the Normal Distribution–Mode of Normal Distribution–Median of Normal Distribution–M.G.F. of Normal Distribution–Cumulant Generating Function (c.g.f.) of Normal Distribution–Moments of Normal Distribution –A Linear Combination of Independent Normal Variates –Fitting of Normal Distribution.	15	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4
VI	Self-Study for Enrichment: (Not included for End Semester Examinations) Extension of Multiplication Law of Probability– Independent Random Variables –Generating Functions– Poisson distribution –Exponential Distribution.	-	CO1, CO2, CO3, CO4, CO5	K1, K2, K3, K4

Text Books

1. Gupta.S.C. & Kapoor.V.K (2018), *Elements of Mathematical Statistics*, Sultan Chand & Sons, New Delhi.
2. Gupta. S.C & Kapoor.V.K (2014), *Fundamentals of Mathematical Statistics*, Sultan Chand & Sons, New Delhi.

Chapters and Sections

UNIT-I	Chapter 4: Section 4.1 to 4.8 (omit 4.7.1) [1]
UNIT-II	Chapter 5: Sections 5.1 to 5.5.3, 5.5.5 [1]
UNIT-III	Chapter 6: Sections 6.1 to 6.8 [1]
UNIT-IV	Chapter 8: Sections 8.1 to 8.3, 8.4 (8.4.1 to 8.4.7) [2]
UNIT-V	Chapter 9: Sections 9.1 and 9.2 (9.2.1 to 9.2.8, 9.2.14) [2]

Reference Books

1. Pillai.R.S.N & Bhagavathi (2008) *Statistics, Theory and Practice* , S.Chand & Sons.
2. Bhishma Rao.G.S.S (2011), *Probability and Statistics*, Scitech Publications (India) Pvt Ltd.
3. Veerarajan.T (2010), *Probability, Statistics and Random Processes*, Tata McGraw Hill Education Private Limited.

Web References

1. <https://www.youtube.com/watch?v=ZKkiCC6uCaU&list=PLpEEfNAthorfhZVYKNREgtWJp2R1vTZfj>
2. <https://www.youtube.com/watch?v=jmqZG6roVqU>
3. <https://www.youtube.com/watch?v=gHBL5Zau3NE>
4. <https://www.youtube.com/watch?v=3PWKOiLK41M>
5. <https://www.youtube.com/watch?v=dOr0NKvD31Q>
6. <https://www.statisticshowto.com/probability-and-statistics/statistics-definitions/uniform-distribution/>

Pedagogy

Power Point Presentations, Group Discussions, Seminar, Quiz and Assignment.

Course Designers

1. Dr. S. Sasikala
2. Dr. R. Radha

PROGRAMMING LANGUAGE USING MATLAB (P)
(2023-2024 Onwards)

Semester I	Internal Marks: 40		External Marks: 60	
COURSE CODE	COURSE TITLE	CATEGORY	Hrs /Week	CREDITS
23UMA1AC2P	Programming Language Using MATLAB (P)	ALLIED PRACTICAL	2	2

Course Objective

- **Apply** MATLAB as a simulation tool.
- **Compute** mathematical solutions using MATLAB and develop inter-disciplinary skills.
- **Determine** syntax, semantics, data-types and library functions of numerical computing.

Course Outcomes

Course Outcome and Cognitive Level Mapping

CO Number	CO Statement	Cognitive Level
	On the successful completion of the course, students will be able to	
CO1	Explain fundamental concepts of MATLAB.	K2
CO2	Illustrate a great numbers of MATLAB commands and how to use them in programming and in many applications of Mathematics.	K2
CO3	Compute simple program for a given problem in MATLAB coding.	K3
CO4	Determine the result and the outcome of any command or script.	K4
CO5	Deduce Mathematical solutions using MATLAB tools.	K5

Mapping of CO with PO and PSO

COs	PSO1	PSO2	PSO3	PSO4	PSO5	PO1	PO2	PO3	PO4	PO5
CO1	3	3	3	3	3	2	3	3	3	3
CO2	3	3	3	3	3	3	3	3	3	3
CO3	3	3	3	3	3	3	3	3	3	3
CO4	3	3	3	3	3	3	3	3	3	3
CO5	3	3	3	3	3	3	3	3	2	3

“1” – Slight (Low) Correlation – “2” – Moderate (Medium) Correlation –
“3” – Substantial (High) Correlation – “-” indicates there is no correlation.

Listings:

1. Operations using Matrices (Addition, Subtraction, Multiplication, Transpose and Inverse)
2. Basic plotting of variables (Simple and multiple data set).
3. Sorting of given data.
4. Finding the sum of 'n' numbers, sum of square of 'n' numbers, sum of 'n' odd numbers.
5. Finding the roots of a polynomial equation.
6. Solving system of equations using matrices.
7. Finding the Eigen vectors and Eigen values.
8. Generating Fibonacci series.
9. Vector operations.
10. Evaluation of integrals.
11. Finding the derivatives of given order.
12. Operations on sets.
13. Finding rank of a matrix.
14. Solving ordinary differential equations.

Web References

1. <https://www.youtube.com/watch?v=EF4wmV5xBM0>
2. <https://www.youtube.com/watch?v=XsrhAO3r3VY>
3. <https://www.youtube.com/watch?v=aEjeuj5jfLU>
4. <https://www.youtube.com/watch?v=ZBafH5fss1E>
5. <https://www.youtube.com/watch?v=XtiAC4adozQ>
6. <https://www.youtube.com/watch?v=kt8QSkM6c>
7. <https://www.youtube.com/watch?v=pi6Dkvs6rP4>
8. <https://www.youtube.com/watch?v=YzEp0jiVvYs>
9. <https://www.youtube.com/watch?v=LFoutvnfP6A>
10. <https://youtu.be/rqWPw21E90A>
11. <https://youtu.be/CUdL4-tJv58>

Pedagogy

Power point presentations, Live Demo, Hands on Training.

Course Designer

Dr. C. Saranya